Opportunistic Survey

- Opportunistic bird observations were made during all survey work including koala habitat searches, hollow bearing tree assessment and checking of traplines. Signs of birds such as feeding stations are also recorded.

Habitat Searches

- Habitat searches were completed to detect signs of bird activity such as nesting, tree hollow use or feeding (eg. *Allocasuarina* cones with characteristic chew marks, owl pellets, owl whitewash etc).

TABLE 2.5
FAUNA SURVEY DETAILS
DIURNAL BIRDS

Date	Survey Method	Survey Effort/Time
25/02/04	Bird census, Opportunistic observation	2hr 1600- 1800
26/02/04	Bird census, Opportunistic observation	2hr 1600- 1800
02/03/04	Bird census, Opportunistic observation	3hr 1400- 1500
03/03/04	Bird census, Opportunistic observation	2hr 0700- 0900
04/03/04	Bird census, Opportunistic observation	2hr 0700- 0900
05/03/04	Bird census, Opportunistic observation	2hr 0700- 0900
03/08/04	Bird census, Opportunistic observation	4 hrs 1200-1600
04/08/04	Bird census, Opportunistic observation	1 hr 30 mins 0800-0930
04/08/04	Bird census, Opportunistic observation	1 hr 1500-1600
05/08/04	Bird census, Opportunistic observation	1 hr 1500-1600
06/08/04	Bird census, Opportunistic observation	3 hrs 0700-1000
01/09/05	Opportunistic observation x 2 people	6hrs 0730 – 1030
01/09/05	Opportunistic observation	3hrs 1330 - 1630
19/03/07	Opportunistic observation	4hrs 1000 - 1400
17/07/07	Winter bird survey	4hrs 1000 - 1400
15/08/07	Winter bird survey	5hrs 1000 - 1500
06/09/07	Opportunistic observation	2hrs 1200 – 1400
07/09/07	Opportunistic observation	2hrs 0800 – 1000
22/01/08	Opportunistic observation	6hrs 0930-1530
12/02/08	Opportunistic observation	7hrs 1100 – 1800
13/02/08	Opportunistic observation	2.5hrs 0730 – 1000
14/02/08	Opportunistic observation	6.5hrs 0830 – 1500
10/03/08	Opportunistic observation x 3	9hrs 1500-1800
11/03/08	Opportunistic observation	8hrs 0800-1200 + 1400-1800
12/03/08	Opportunistic observation	8hrs 30min 0730-1200 + 1400-1800
13/03/08	Opportunistic observation	6hrs 30min 0730-1100 + 1400-1700
14/03/08	Opportunistic observation x 2	12hrs 0830-1430
07/05/08	Winter Bird Survey	5hrs 1030 – 1530

Nocturnal Birds Survey

Nocturnal bird surveys were conducted over a range of different seasons. Diurnal searches of the subject site did not identify any obvious roosting or nesting sites for threatened owl species. These sites are normally distinguished by whitewash splattered over lower canopy foliage and ground cover, or by the presence of suitable nesting hollows with regurgitated pellets on the ground below.

The following survey methodologies were applied:

Spotlighting

- Spotlight surveys were conducted in the evening after sunset for two hours. Surveys were carried out by one or more persons using a 55 watt spotlight powered by a 12 volt rechargeable battery. Spotlighting was carried out along existing tracks within woodland or forest with open understorey, around individual trees, and trapping transects (if accessible).

Recorded Call Playback

- Prior to the completion of spotlighting, recorded calls of the Powerful, Barking, Masked, Grass and Sooty Owls were broadcast using 13 watt battery operated loudspeaker. Each call type was played for five minutes followed by a two minute listening period. The immediate area was then surveyed with a spotlight to survey for owls.

Stagwatching

- Stagwatch surveys were conducted in the evening for approximately 15 minutes prior to and 45 minutes after sunset. Selected groups of hollow trees identified as habitat potential were observed for use by fauna. Any owls observed leaving hollows are noted and identified.

TABLE 2.6
FAUNA SURVEY DETAILS
NOCTURNAL BIRDS

Date	Survey Method	Survey Effort/Time
25/02/04	Spotlighting + call playback	3hrs 15min 2015-2330
26/02/04	Spotlighting + call playback	2hrs 2015-2215
03/03/04	Spotlighting + call playback	2hrs 15min 1945-2200
04/03/04	Spotlighting + call playback	2hrs 2000-2200
03/08/04	Spotlighting + call playback	2hrs 1800-2000
04/08/04	Spotlighting + call playback	2hrs 1800-2000
05/08/04	Spotlighting + call playback	2hrs 1800-2000
01/09/05	Spotlighting + call playback	2hrs 30mins 1800-2030
06/09/07	Spotlighting + call playback	2hrs 1700-1900
12/02/08	Spotlighting + call playback	1hrs 30mins 2000-2130
14/02/08	Spotlighting + call playback	1hrs 30mins 2000-2030
10/03/08	Spotlighting x 2 + call playback	3 hr 30min 2000-2145
11/03/08	Spotlighting + call playback	1 hr 45min 2000-2145
12/03/08	Spotlighting + call playback	1 hr 45min 1945-2130
13/03/08	Spotlighting x 2 + call playback	3 hr 30min 2000-2145

2.3.3 Mammal Survey Methods

The methods used for mammal surveys are outlined below and detailed in Table 2.7 and Table 2.8.

Arboreal Mammal Survey

The following survey methodologies were applied:

Elliott Trapping

- Arboreal mammal trapping involved the use of Type A and Type B Elliott Traps. Traps were secured with rubber bands onto mounts that were attached to the trunk of large trees (Diameter at Breast Height - DBH > 100mm) at heights of approximately two to three metres.

- Traps were set for a period of three consecutive nights. Traps were baited with a mixture of peanut butter, rolled oats and honey. A 50/50 solution of honey and water was sprayed on the tree trunk, trap and mount to act as an attractant for arboreal mammals. All traps were checked each morning. After their release, captured animals are traced to their den sites if possible.

Spotlighting

- Spotlight surveys were conducted in the evening after sunset for two hours. Surveys were carried out by one or more persons using a 55 watt spotlight powered by a 12 volt rechargeable battery. Spotlighting was carried out along existing tracks and within woodland or forest with open understorey, around individual trees, and trapping transects (if accessible).

Hair Tubes

- Hair tubes comprising of large (90mm diameter) and small (30mm diameter) PVC stormwater pipe fitted with a PVC plug and cap at one end creating a bait chamber were used. Bait was placed in the chamber between the cap and the plug. The chamber had several holes drilled into it to allow the smell of the bait to permeate from the tube without allowing access into the chamber. Strips of Schafco Advance Tape were placed around the inner surface of the tube opening to catch hairs of fauna visiting the hair tubes.

- For arboreal fauna surveying, the hair tube was attached to the trunk of the tree using nails and rubber bands, at a height of approximately 2 metres. Tubes were attached with the open side facing down to prevent rain affecting the adhesiveness of the tape. Tubes were baited with a mixture of rolled oats, peanut butter and honey, and a 50/50 honey water mix sprayed on the trunk of the tree as an attractant. Hair tubes were left in place for 10 days. Hair samples were sent to Barbara Triggs for analysis.

Stagwatch

- Stagwatch surveys were conducted in the evening for approximately 15 minutes prior to and 45 minutes after sunset during spotlight surveys. Hollow trees identified as habitat potential were observed for use by fauna. Any mammals observed leaving hollows were noted and identified.

TABLE 2.7
FAUNA SURVEY DETAILS
ARBOREAL MAMMALS

Date	Survey Method	Survey Effort/Time
25/02/04	Spotlighting	3hrs 15min 2015-2330
25/2/04-5/3/04	Hair Tubes	400 Tube nights
26/02/04	Spotlighting	2hrs 2015- 2215
02/03/04	Small Mammal Trapping	Table 2.9
03/03/04	Small Mammal Trapping	Table 2.9
03/03/04	Koala scat – spot survey	2hrs 30mins
03/03/04	Spotlighting	2hrs 15min 1945- 2200
04/03/04	Koala scat – spot survey – 3 persons	1000-1400 x 3 persons
04/03/04	Spotlighting	2hrs 2000- 2200
04/03/04	Small Mammal Trapping	Table 2.9
03/08/04	Small Mammal Trapping	Table 2.9
03/08/04	Spotlighting + recorded call playback (koala)	2hrs 1800- 2000
04/08/04	Small Mammal Trapping	Table 2.9
04/08/04	Spotlighting + recorded call playback (koala)	2hrs 1800- 2000
05/08/04	Small Mammal Trapping	Table 2.9
05/08/04	Spotlighting	2hrs 1800- 2000
31/08/05	Small Mammal Trapping	Table 2.9
01/09/05	Small Mammal Trapping	Table 2.9
01/09/05	Spotlighting	2hrs 30mins 1800-2030
19/03/07	Koala survey	8 hrs 1000-1400 x 2
15/08/07	Koala survey	5 hrs 1000-1500
06/09/07	Spotlighting	2hrs 1700-1900
22/01/08	Opportunistic searches	6hrs 0930-1530
12/02/08	Small Mammal Trapping	Table 2.9
12/02/08	Spotlighting	1.5hrs 2000-2130
12/02/08	Call playback	1.5hrs 2000-2130
13/02/08	Small Mammal Trapping	Table 2.9
14/02/08	Small Mammal Trapping	Table 2.9
14/02/08	Spotlighting	1.5hrs 2000-2130
14/02/08	Call playback	1.5hrs 2000-2130
10/03/08	Small Mammal Trapping	Table 2.9
10/03/08	Spotlighting x 2	3 hr 30min 2000 - 2145
10/03/08	Call playback	1 hr 45min 2000 - 2145
11/03/08	Small Mammal Trapping	Table 2.9
11/03/08	Spotlighting	1 hr 45min 2000 - 2145
11/03/08	Call playback	1 hr 45min 2000 - 2145
12/03/08	Small Mammal Trapping	Table 2.9
12/03/08	Spotlighting	1hr 45min 2000 - 2145
12/03/08	Call playback	1 hr 45min 1945 - 2130

TABLE 2.7 (Cont.) FAUNA SURVEY DETAILS ARBOREAL MAMMALS		
Date	**Survey Method**	**Survey Effort/Time**
12/03/08 – 21/03/08	10 Hair Tubes x 3 transects	300 Hair Tube Nights
13/03/08	Small Mammal Trapping	Table 2.9
13/03/08	Spotlighting x2 persons	3 hr 30min 2000 - 2145
13/03/08	Call playback	1 hr 45min 2000-2145
31/03/08	Small mammal trapping	Table 2.9
31/03/08	Spotlighting	2hrs 2015-2215
31/03/08	Call playback	45mins 2000-2045
01/04/08	Small mammal trapping	Table 2.9
01/04/08	Spotlighting	2hrs 2000-2200
01/04/08	Call playback	45mins 1945-2030
02/04/08	Small mammal trapping	Table 2.9
02/04/08	Spotlighting	2hrs 2000-2200
02/04/08	Call playback	45mins 1945-2030
03/04/08	Small mammal trapping	Table 2.9
03/04/08	Spotlighting	2hrs 2000-2200
03/04/08	Call playback	45mins 1945-2030

Terrestrial Mammal Survey

The following survey methodologies were applied for terrestrial mammals.

Diurnal Observations

Daytime observations of any mammals were recorded during any site visits. This method is useful for the larger macropod species and feral species such as dogs, foxes and cats.

Elliott Trapping

- Terrestrial mammal trapping involved the combined use of both Type A and Type B Elliott Traps. Elliott Traps are small folding box traps available in two sizes, Type A (330 x 100 x 100 mm) and Type B (450 x 150 x 150 mm) (Elliott Scientific Co., Victoria).

- Traps were placed on the ground along predefined transects. There are 5-10 traps per transect with transect length generally between 100-200 metres.

- Traps were set for a period of three consecutive nights. Traps were baited with a mixture of peanut butter, rolled oats and honey, and strategically positioned next to animal diggings, burrows, fallen logs, tree trunks and animal runways.

Spotlighting

- Spotlight surveys were conducted in the evening after sunset for two hours. Surveys were carried out by one or two persons using a 55 watt spotlight powered by a 12 volt rechargeable battery. Spotlighting was carried out along existing tracks and within woodland or forest with open understorey, around individual trees, and trapping transects (if accessible).

Hair Tubes

- Hair tubes comprising of large (90mm diameter) and small (30mm diameter) PVC stormwater pipe fitted with a PVC plug and cap at one end creating a bait chamber were used. Bait was placed in the chamber between the cap and the plug. The chamber has several holes drilled into it to allow the smell of the bait to permeate from the tube without allowing access into the chamber. Strips of Schafco Advance Tape were placed around the inner surface of the tube opening to catch hairs of fauna visiting the hair tubes.

- Hair tubes were placed along transects in suitable locations and left in place for 10 days. Tubes were baited either with chicken meat or with a mixture of peanut butter, rolled oats and honey. Hair samples were sent to Barbara Triggs for analysis.

Cage Trapping

- Traps were baited with chicken or rolled oats, peanut butter and honey and placed within transect lines, usually in conjunction with Elliott trapping. Traps were set for a period of three or four continuous nights.

Pitfall Trapping

- Pitfall trapping involved lining an excavated pit with a bucket or a PVC pipe. Pit dimensions were 28cm aperture x 40cm pit depth, or 15cm aperture x 60cm pit depth. Each pit (trap) contained at least 5m of plastic drift fencing, 30cm high either side of each pit. The fencing was secured via pegs so that it remains upright forming an impassable barrier for small fauna. The bottom of each pit was covered with leaf litter to provide shelter for entrapped fauna. A floating object was placed in each pit in case of rainfall inundating the pit.

- Pits were checked each morning and late afternoon, and all entrapped fauna identified and released.

TABLE 2.8
FAUNA SURVEY DETAILS
TERRESTRIAL MAMMALS

Date	Survey Method	Survey effort/Time
12/02/08	Small Mammal Trapping	Table 2.9
12/02/08	Spotlighting	1.5hrs 2000-2130
13/02/08	Small Mammal Trapping	Table 2.9
14/02/08	Small Mammal Trapping	Table 2.9
14/02/08	Spotlighting	1.5hrs 2000-2130
10/03/08	Opportunistic Observation	9hrs 1500-1800
10/03/08	Small Mammal Trapping	Table 2.9
10/03/08	Pitfall Traps 1line x 4pits & 1line x 5 pits	9 pitfall trap nights
10/03/08	Spotlighting x 2	3hr 30min 2000 - 2145
11/03/08	Small Mammal Trapping	8hrs 0800-1200 + 1400-1800
11/03/08	Small Mammal Trapping	Table 2.9
11/03/08	Pitfall Traps 1line x 4pits & 1line x 5 pits	9 pitfall trap nights
11/03/08	Spotlighting	1hr 45min 2000 - 2145
12/03/08	Small Mammal Trapping	8hrs 30mins 0730-1200 + 1400-1800
12/03/08	Small Mammal Trapping	Table 2.9

TABLE 2.8 (Cont.) FAUNA SURVEY DETAILS TERRESTRIAL MAMMALS		
Date	**Survey Method**	**Survey effort/Time**
12/03/08	Pitfall Traps 1line x 4pits & 1line x 5 pits	9 pitfall trap nights
12/03/08	Spotlighting	1hr 45min 1945 - 2130
12/03/08 – 21/03/08	Hair Tubes 10 tubes x 3 transects Opportunistic Observation	300 Hair Tube Nights
13/03/08	Small Mammal Trapping	Table 2.9
13/03/08	Pitfall Traps 1line x 4pits & 1line x 5 pits	9 pitfall trap nights
13/03/08	Spotlighting x 2	3hr 30min 2000-2145
31/03/08	Small mammal trapping	Table 2.9
31/03/08	Spotlighting	2hrs 2015-2215
31/03/08	Habitat search	3hrs 0700-1000
01/04/08	Small mammal trapping	Table 2.9
01/04/08	Spotlighting	2hrs 2000-2200
01/04/08	Habitat search	3hrs 0700-1000
02/04/08	Small mammal trapping	Table 2.9
02/04/08	Spotlighting	2hrs 2000-2200
02/04/08	Habitat search	3hrs 0700-1000
03/04/08	Small mammal trapping	Table 2.9
03/04/08	Spotlighting	2hrs 2000-2200
03/04/08	Habitat search	3hrs 0700-1000

TABLE 2.9 SMALL MAMMAL TRAPPING – SURVEY DETAILS									
Area	**Transect**	**Survey Period**	**Nights**	**Arboreal Elliot**			**Terrestrial Elliot Traps**		
				A	**B**	**E**	**A**	**B**	**Cage**
A	1	1	3	2	3	-	2	3	2
	2	1	3	2	3	-	2	3	2
	3	1	3	2	3	-	2	3	2
	4	2	3	2	3	-	2	3	2
B	5	2	3	2	3	-	2	3	2
	6	2	3	2	3	-	2	3	2
	7	2	3	2	3	-	2	3	2
	8	2	3	2	3	-	2	3	2
C	9	1	3	2	3	-	2	3	2
	10	1	3	2	3	-	2	3	2
	11	1	3	2	3	-	2	3	2
	12	2	4	2	3	-	2	3	2
	13	1	3	2	3	-	2	3	2
	14	2	4	2	3	-	2	3	2
	15	2	4	2	3	-	2	3	2
D	16	3	4	2	3	5	2	5	3
	17	3	4	2	3	5	2	5	3

TABLE 2.9 (Cont.) SMALL MAMMAL TRAPPING – SURVEY DETAILS									
Area	**Transect**	**Survey Period**	**Nights**	**Arboreal Elliot**			**Terrestrial Elliot Traps**		
				A	**B**	**E**	**A**	**B**	**Cage**
	18	3	4	2	3	5	2	5	3
E				No Trapping					

Survey Periods/Dates

1 12, 13, 14 February 2008 (3 nights)

2 11, 12, 13, 14 March 2008 (4 nights)

3 31 March 2008, 1, 2, 3 April (4 nights)

Bats

The subject site contains suitable foraging habitat for all locally occurring megachiroptera and microchiroptera bat species. Roosting habitat is present only for those species that roost in tree hollows or under bark. Suitable roosting sites are only available for hollow, under bark or tree roosting bat species. The bat survey details are provided in Table 2.10.

The following survey methodologies were utilized:

Sonar Detection

- The ultrasonic calls of Microchiroptera bats were recorded to audio cassette tapes using an Anabat II echolocation call detector. Recordings were made for a continuous two hour period at dusk/early evening with the Anabat II then being left overnight with call activated recording switch.

- An Anabat II ZCA Interface Module and Anabat 5.2b Software package for an IBM Compatible computer was used to analyse the ultrasonic call patterns recorded during the field survey and to identify those species recorded on site.

Harp Traps

- Harp traps were placed across flyways, eg. across tracks, trails or understorey openings within suitable vegetation types for a minimum of three nights. Harp Traps were checked each morning, and any captured bats identified and released.

Stagwatch

- Stagwatch surveys were conducted in the evening for approximately 15 minutes prior to and 45 minutes after sunset. Hollow trees identified as habitat potential were observed for use by microchiroptera bats. Any bats observed leaving hollows were recorded by Anabat II detectors positioned at the base of the tree.

Spotlighting

- Flying-foxes were surveyed for spotlighting potential food trees and identifying their characteristic social calls.

TABLE 2.10 FAUNA SURVEY DETAILS BATS		
Date	**Survey Method**	**Survey Effort/Time**
25/02/04	Anabat II x 2 + spotlighting	4hrs 1945- 2145
26/02/04	Anabat II x 2 + spotlighting	4hrs 1945- 2145
03/03/04	Anabat II x 2 + spotlighting	4hrs 30min 1945- 2200
04/03/04	Anabat II x 2 + spotlighting	4hrs 30min 1945- 2200
04/04/04	Anabat II x 2 + spotlighting	4hrs 30min 1945- 2200
03/08/04	Anabat II x 2 + spotlighting	4hrs 40 mins 1725-1945
04/08/04	Anabat II x 2 + spotlighting	4hrs 30 mins 1730-1945
05/08/04	Anabat II x 2 + spotlighting	1hr 30mins 1745-1830
01/09/05	Anabat II + spotlighting	2hrs 15mins 1800-2015
06/09/07	Anabat II + spotlighting	2hrs 1700 – 1900
12/02/08	Anabat II + spotlighting	1.45hrs 2000-2130
14/02/08	Anabat II + spotlighting	1.45hrs 2000-2130
10/03/08	Anabat II x 3	Overnight
10/03/08	Spotlighting x 2	3.5hrs 2000 - 2145
10/03/08	Harp Trap x 3	3 harp trap nights
11/03/08	Anabat II x 3	Overnight
11/03/08	Spotlighting	1hr 45mins 2000 - 2145
11/03/08	Harp Trap x 3	3 harp trap nights
12/03/08	Anabat II x 2	Overnight
12/03/08	Spotlighting	1hr 45mins 2000 - 2145
12/03/08	Harp Trap x 3	3 harp trap nights
13/03/08	Anabat II x 2	Overnight
13/03/08	Spotlighting x 2	3.5 hrs 2000-2145
31/03/08	Anabat II x 2 + spotlighting	2hrs 2015-2215
01/04/08	Anabat II x 3 + spotlighting	2hrs 2000-2200
02/04/08	Anabat II x 3 + spotlighting	2hrs 2000-2200
03/04/08	Anabat II x 3 + spotlighting	2hrs 2000-2200

2.3.4 Frog Survey Methods

The survey methods used are outlined below and detailed in Table 2.11.

The following survey methodologies were utilized:

Habitat Search

- Habitat searches involve searching likely niches such as dense undergrowth, around trees, under logs and rocks, and aquatic habitats. Amphibian species observed during habitat searches were noted and the calls of species not observed were recorded onto a personal cassette recorder for later comparison with call reference libraries. Captured individuals were identified on site using field reference texts and released.

Pitfall Trapping

- Pitfall trapping involves lining an excavated pit with a bucket or a PVC pipe. Pit dimensions were 28cm aperture x 40cm pit depth, or 15cm aperture x 60cm pit depth. Each pit (trap) contained at least 5m of drift fencing, 30cm high either side of each pit. The fencing was secured via pegs so that it remains upright forming an impassable barrier for frogs. The bottom of each pit was covered with leaf litter to

provide shelter for entrapped fauna. A floating object was placed in each pit in case of rainfall inundating the pit.

- Pits were checked each morning and late afternoon, and all entrapped fauna identified and released.

Nocturnal Habitat Searches

- Nocturnal watercourse searches based on one hour per 100m of water body edge were conducted using a torch and headlamp of less than 30 watts of power.

- Aquatic freshwater habitats present were sampled for the presence of particular fish species to gather information on any predatory fish species such as *Gambusia holbrooki*. A small dip net was passed through the water body a number of times to sample the fish stock of the aquatic habitat.

Opportunistic Survey

- Opportunistic sightings of any amphibians were also made while undertaking other survey work and during spotlight surveys of the site.

Recorded Frog Call Playback

- Recorded frog call playback was undertaken as part of a targeted survey to record the distribution of the Wallum Froglet.

Call Identification

- Any frogs heard calling were identified in the field or recorded onto cassette for later identification.

TABLE 2.11
FAUNA SURVEY DETAILS
AMPHIBIANS

Date	Survey Method	Survey Effort/Time
25/02/04	Call detection, spotlighting	3hrs 15min 2015-2330
26/02/04	Call detection, spotlighting	2hrs 2015- 2215
03/03/04	Call detection, spotlighting	2hrs 15min 1945- 2200
06/04/04	Recorded call playback survey - Wallum Froglet target survey	5hrs 0945-1245 + 1315-1515
04/04/04	Call detection + spotlighting	2hrs 2000- 2200
05/08/04	Call detection + spotlighting	2hrs 1800- 2000
01/09/05	Call detection + spotlighting	2hrs 30min 1800-2030
06/09/07	Call detection + spotlighting	2hrs 1700-1900
22/01/08	Opportunistic diurnal call detection	6hrs 0930-1530
12/02/08	Opportunistic diurnal call detection	7hrs 1100 – 1800
12/02/08	Call detection + spotlighting	1.5hrs 2000-2130
13/02/08	Opportunistic diurnal call detection	2.5hrs 0730 – 1000
14/02/08	Opportunistic diurnal call detection	6.5hrs 0830 – 1500
14/02/08	Call detection + spotlighting	1.5hrs 2000-2130
10/03/08	Diurnal habitat searches and call detection	3hrs 1500-1800
10/03/08	Pitfall Traps 1line x 4pits & 1line x 5 pits	9 pitfall trap nights
10/03/08	Call detection + spotlighting x 2	3hrs 30mins 2000 - 2145
10/03/08	Nocturnal water body search x 2	1hr 1945 - 2015
11/03/08	Diurnal habitat searches and call detection	8hrs 0800-1200 + 1400-1800

TABLE 2.11 (Cont.) FAUNA SURVEY DETAILS AMPHIBIANS		
Date	**Survey Method**	**Survey Effort/Time**
11/03/08	Pitfall Traps 1line x 4pits & 1line x 5 pits	9 pitfall trap nights
11/03/08	Nocturnal water body search	30min 1930-2000
11/03/08	Call detection + spotlighting	1hr 45mins 2000 - 2145
12/03/08	Habitat search, Opportunistic survey	4hrs 1400-1800
12/03/08	Spotlighting	1hr 45mins 2000 - 2145
12/03/08	Pitfall Traps 1line x 4pits & 1line x 5 pits	9 pitfall trap nights
13/03/08	Habitat search, Opportunistic survey	3hrs 1400-1700
13/03/08	Spotlighting x 2	3hrs30mins 2000-2145

2.3.5 Reptile Survey Methods

Details on surveys for reptiles are provided in Table 2.12 and outlined below.

Habitat Searches

- Habitat searches involved searching likely niches such as dense undergrowth, around trees, under logs and rocks, and aquatic edge habitats. Reptile species observed during habitat searches were noted and if individuals are captured in pitfall traps they are identified on site using field reference texts and released.

Pitfall Trapping

- Pitfall trapping involved lining an excavated pit with a bucket or a PVC pipe. Pit dimensions were 28cm aperture x 40cm pit depth, or 15cm aperture x 60cm pit depth. Each pit (trap) contained at least 5m of plastic drift fencing, 30cm high either side of each pit. The fencing was secured via pegs so that it remains upright forming an impassable barrier for small fauna. The bottom of each pit was covered with leaf litter to provide shelter for entrapped fauna. A floating object was placed in each pit in case of rainfall inundating the pit.

Opportunistic Searches

- Opportunistic sightings of any reptiles also made while undertaking other survey work were recorded.

Spotlighting

Spotlight surveys were conducted in the evening for two hours after sunset to target nocturnal reptile species. Both terrestrial and arboreal habitats were searched during nocturnal searches. Surveys were carried out by one or two persons and involve the use of a 55 watt spotlight powered by a 12 volt rechargeable battery. Spotlighting was carried out along existing tracks within woodland or forest with open understorey, individual trees, and where accessible, trapping transects.

TABLE 2.12 FAUNA SURVEY DETAILS REPTILES		
Date	**Survey Method**	**Survey Effort/Time**
25/02/04	Spotlighting	3hrs 15min 2015-2330
26/02/04	Spotlighting	2hrs 2015- 2215
04/03/04	Habitat search, Opportunistic survey	2hrs 0730-0930
03/08/04	Habitat search, Opportunistic survey	4 hrs 1200-1600
04/08/04	Habitat search,	2hrs 0730- 0930
04/08/04	Habitat search, Opportunistic survey	1 hr 1500-1600
05/08/04	Habitat search, Opportunistic survey	1 hr 1500-1600
06/08/04	Habitat search, Opportunistic survey	3 hrs 0700-1000
01/09/05	Opportunistic observation x 2 people	6hrs 0730 – 1030
01/09/05	Opportunistic observation	3hrs 1330 – 1630
22/01/08	Opportunistic observation	6hrs 0930-1530
12/02/08	Habitat search, Opportunistic survey	7hrs 1100 – 1800
12/02/08	Spotlighting	1.5hrs 2000-2130
13/02/08	Habitat search, Opportunistic survey	2.5hrs 0730 – 1000
14/02/08	Habitat search, Opportunistic survey	6.5hrs 0830 – 1500
14/02/08	Spotlighting	1.5hrs 2000-2130
10/03/08	Habitat search, Opportunistic survey x 3	9hrs 30mins 1450-1800
10/03/08	Spotlighting x 2	3hr 30mins 2000 - 2145
10/03/08	Pitfall Traps 1line x 4pits & 1line x 5 pits	9 pitfall trap nights
11/03/08	Habitat search, Opportunistic survey	4hrs 1400-1800
11/03/08	Spotlighting	1hr 45mins 2000 - 2145
11/03/08	Pitfall Traps 1line x 4pits & 1line x 5 pits	9 pitfall trap nights
12/03/08	Habitat search, Opportunistic survey	4hrs 1400-1800
12/03/08	Spotlighting	1hr 45mins 2000 - 2145
12/03/08	Pitfall Traps 1line x 4pits & 1line x 5 pits	9 pitfall trap nights
13/03/08	Habitat search, Opportunistic survey	3hrs 1400-1700
13/03/08	Spotlighting x 2	7hrs 2000-2145

2.3.6 Koala Habitat Survey

The subject area was assessed for activity by Koalas using the following methods:

i. A search of the Atlas of NSW Wildlife (NPWS 2008) was undertaken to identify records of koalas located within 10km of the site.
ii. Review of previous flora and fauna surveys and SEPP 44 assessments undertaken across the site and within the local area.
iii. The site was surveyed on foot with species Koala food trees being inspected for signs of Koala usage. Trees were inspected and identified for presence of Koalas, scratch and claw marks on the trunk and scats around the base of each tree.
iv. Koalas were targeted during spotlight and call playback surveys.
v. Identification and an assessment of the density of tree species listed as Koala feed trees in State Environmental Protection Policy No. 44 – Koala Habitat Protection was undertaken across the site.
vi. The ground below trees was searched for signs of Koala usage on the 3 and 4 March 2004, 19 March 2007, and the 15 August 2007 using the Spot Assessment Technique (Phillips and Callaghan 1995).

For each assessment, 20 trees were inspected for signs of Koala usage, eg. scats at the base of trees or scratches on the trunks.

2.3.7 Hollow Bearing Tree Assessment

Hollow bearing trees were identified across the subject site, trees were assessed recording tree species, diameter at breast height, spread and height and percentage health of the tree, notes on fauna usage were also made. Hollows identified within these trees were graded by aperture size ranging from <10cm to >30cm and divided into trunk or branch hollows, broken trunk, areas where fauna can take refuge such as tree splits and bark splits were also recorded. The location of hollow bearing trees was recorded onto a field GPS unit for recording onto a site plan.

A total of 48 hollow bearing trees were identified within the residential zoned area of the subject site while an estimated 42 hollow bearing or potential hollow bearing trees were observed within the Conservation Zoned land to the east. These 42 trees were not surveyed or assessed in detail due to the difficultly of surveying through the dense undergrowth of the vegetation within this area.

2.3.8 Fish Species Survey

A detailed survey for fish species utilizing the aquatic areas of the constructed lake was undertaken by a joint collaboration between The Ecology Lab Pty Ltd and Harris Research Pty Ltd in April 2007. This survey followed up previous fish surveys of the lake in 1998 and 2002 by the Australian Museum Business Services (AMBS 1998, 2002). The methods used for sampling the fish species was a combination of Seine Netting (seven survey points) and Gill Netting (four sample points) over a 2 day period in April 2007. Full details of the survey methods used are provided in the separate report prepared by Harris Research Pty Ltd (2007).

Original plan produced in A3 colour. Flora survey locations are approximate and have not been fixed by land survey. Plan for indicative purposes only. Not for detailed measurement. *Subject Site boundary subject to final survey.

Legend

- Subject Site Boundary
- 20x20m Vegetation Quadrat (numbered)
- 100m Vegetation Transect (numbered)

1. Pasture with Scattered Trees
2. Acacia / Melealuca Regrowth Scrub
3. Open Forest (*Corymbia gummifera*)
4. Open Forest (*Corymbia maculata, Eucalyptus paniculata*)
5. Open Forest (*Eucalyptus microcorys*)
6. Open Forest (*Eucalyptus pilularis*)
7. Woodland (*Eucalyptus resinifera*)
8. Woodland / Open Forest (*Eucalyptus robusta*)
9. Woodland (*Eucalyptus signata*)
10. Woodland/Open Forest (*Eucalyptus umbra*)
11. Pine Forest (*Pinus eliotii*)
12. Disturbed Estuarine Vegetation
13. Casuarina forest (*Casuarina glauca*)
14. Mangroves (*Avicennia marina*)
15. Saltmarsh (*Juncus kraussii*)
16. Rushland (*Baumea juncea*)
17. Scrub (*Melaleuca ericifolia*)
18. Paperbark Forest (*Melaleuca quinquenervia*)

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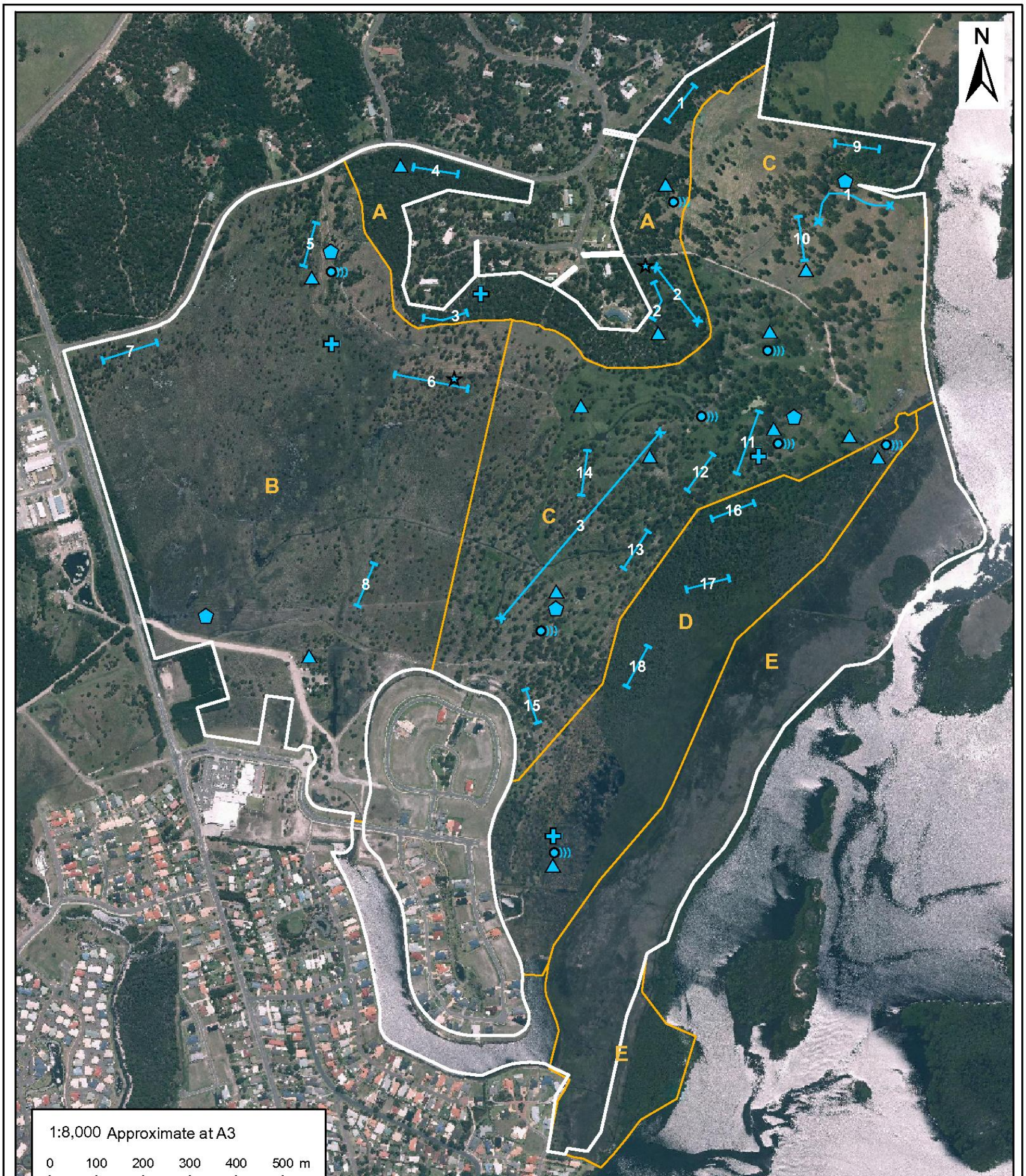
Ver:FX By:JM
25/07/08
Ref.No.8020

Figure 2.1
Vegetation Communities and Flora Survey Locations
Riverside, Tea Gardens

Source: Aerial © Department of Lands (2007)



Original plan produced in A3 colour. Survey locations are approximate and have not been fixed by land survey. Plan for indicative purposes only. Not for detailed measurement. *Subject Site boundary subject to final survey.

Legend

- Subject Site Boundary
- Anabat Station 2008
- Owl Call Playback Station 2008
- Pitfall Trapline 2008
- Harp Trap 2008
- Frog Habitat Search 2008
- Fauna Trapline (1-18) 2008
- Hair Tube Transect (1-3) 2008

Fauna Survey Stratification Areas

- A Northern Slopes Open Forest
- B Western Lowlands Woodland
- C Central-northern Open Forest / Woodland
- D Eastern Swamp Forest
- E Estuarine Wetlands

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Figure 2.2
Fauna Survey Locations 2008
Riverside, Tea Gardens

Ver:FX By:JM 25/07/08 Ref.No.8020

Source: Aerial © Department of Lands (2007)

SECTION 3

RESULTS OF FLORA AND FAUNA SURVEY

3.1 FLORA

3.1.1 Vegetation Communities

The flora species identified on the subject site are listed in Table 3.1. This list is a combination of all flora surveys conducted on the subject site by different botanists over the last 15 years. Because the methods used in the various surveys no specific quadrat based data is available for the pre 2008 surveys. The results of the 2008 transect and quadrat based survey following the DEC Draft Guidelines (DEC 2004) are provided in Annexure 1.

The vegetation communities present on site are:

19. – Pasture with Scattered Trees;
20. – Acacia / Melaleuca Regrowth Scrub;
21. – Open Forest (*Corymbia gummifera*);
22. – Open Forest (*Corymbia maculata, Eucalyptus paniculata*);
23. – Open Forest (*Eucalyptus microcorys*);
24. – Open Forest (*Eucalyptus pilularis*);
25. – Woodland (*Eucalyptus resinifera*);
26. – Woodland / Open Forest (*Eucalyptus robusta*);
27. – Woodland (*Eucalyptus signata*);
28. – Woodland / Open Forest (*Eucalyptus umbra*);
29. – Pine Forest (*Pinus eliottii*);
30. – Disturbed Estuarine Vegetation;
31. – Casuarina Forest (*Casuarina glauca*);
32. – Mangroves (*Avicennia marina*);
33. – Saltmarsh (*Juncus kraussii*);
34. – Rushland (*Baumea juncea*);
35. – Scrub (*Melaleuca ericifolia*);
36. – Paperbark Forest (*Melaleuca quinquenervia*).

Detailed description of each vegetation community is provided below while the distribution of the vegetation communities is provided in Figure 2.1. The vegetation within the site has been classified by community structure and dominant tree species within that community. Due to history of agricultural and plantation pine forestry land uses the natural vegetation of the site has been highly disturbed and modified. The understorey characteristics of the vegetation reflect the past disturbances and current agricultural activities. Areas of grassland/improved pasturelands have been incorporated within the vegetation communities classified after the dominant tree species of that community.

1. Pasture with Scattered Trees

***Structure*:**

Trees: To 20 metres in height, with a highly variable 6-45% Projected Foliage Cover (PFC).

Shrubs: To 3.5 metres in height, with 2-5% PFC.

Groundlayer: To 2 metre in height, with 90% PFC.

Floristics:

(Main Species Present)

Trees: *Angophora costata* (Smooth-barked Apple), *Corymbia gummifera* (Red Bloodwood), *Einandra sieberi* (Hard Corkwood), *Eucalyptus microcorys* (Tallowwood) and *Eucalyptus robusta* (Swamp Mahogany).

Shrubs: *Epacris pulchella* (NSW Coral Heath), *Leucopogon lanceolatus*, *Melaleuca nodosa* (Ball Honey Myrtle), *Acacia ulicifolia* (Prickly Moses) and *Leptospermum polygalifolium* (Yellow Tea Tree).

Groundlayer: *Trifolium repens* (White Clover), *Andropogon virginicus* (Whisky Grass), *Pennisetum clandestinum* (Kikuyu), *Pomax umbellata* (Pomax), *Setaria pumila* (Pale Pigeon Grass), *Lomandra longifolia* (Spiky-headed Mat-rush) and *Baloskion tetraphyllum* subsp. *meiostachyum*.

Weeds: *Trifolium repens* (White Clover), *Andropogon virginicus* (Whisky Grass) and *Pennisetum clandestinum* (Kikuyu).

Comments:

This vegetation community occurs scattered throughout the northern and central eastern parts of the site and occupies approximately 36 hectares. It is moderately to highly disturbed by previous activities such as, tree felling, underscrubbing, grazing and incursions of moderate to high levels of exotic weed species. Areas within this vegetation community contain very few trees and one predominantly pasture area

2. Acacia / Melaleuca Regrowth Scrub

***Structure*:**

Trees: To 18 metres in height, with a patchy 10% Projected Foliage Cover (PFC).

Shrubs: To 5 metres in height, with dense 50-70% PFC.

Groundlayer: To 1 metre in height, with 5 to10% PFC.

Floristics:

(Main Species Present)

Trees: *Angophora costata* (Smooth-barked Apple), *Eucalyptus resinifera* (Red Mahogany), *Melaleuca linariifolia* (Snow in Summer) and *Corymbia gummifera* (Red Bloodwood).

Shrubs: *Acacia longifolia* (Sydney Golden Wattle), *Melaleuca sieberi*, *Melaleuca nodosa* (Ball Honey Myrtle) and *Callistemon salignus* (Willow Bottlebrush).

Groundlayer: *Entolasia stricta* (Wiry Panic), *Entolasia marginata* (Bordered Panic), *Epacris pulchella* (NSW Coral Heath), *Hydrocotyle peduncularis, Gahnia sieberiana* (Red-fruited Saw-sedge) and *Gonocarpus teucroides* (Raspwort).

Weeds: *Pennisetum clandestinum* (Kikuyu), *Paspalum spp.*, *Pinus eliottii* (Slash Pine).

Comments:
This vegetation community is located in a small area in the northern part of the site and occupies approximately 2 hectares. This community has been highly disturbed by previous clearing, subsequent regrowth and invasion by exotic species.

3. Open Forest (*Corymbia gummifera*)

***Structure*:**

Trees: To 20 metres in height, with a highly variable 6 - 60% Projected Foliage Cover (PFC).

Shrubs: To 2 metres in height, with 2-6% PFC.

Groundlayer: To 1.6 metres in height, with 95% PFC.

Floristics:
(Main Species Present)

Trees: *Corymbia gummifera* (Red Bloodwood).

Shrubs: *Dodonaea triquetra* (Large-leaved Hop Bush) and *Platysace lanceolata* (Native Parsnip).

Groundlayer: *Andropogon virginicus* (Whisky Grass), *Pteridium esculentum* (Bracken), *Microlaena stipoides* var. *stipoides, Pomax umbellata* (Pomax), *Baloskion tetraphyllum* subsp. *meiostachyum, Selaginella uliginosa* (Swamp Selaginella), *Lepidosperma laterale* (Variable Sword Sedge), *Pratia purpurascens* (Whiteroot) and *Axonopus fissifolius* (Narrow-leaved Carpet Grass).

Weeds: *Chrysanthemoides monilifera* subsp. *rotundata* (Bitou Bush), *Andropogon virginicus* (Whisky Grass) and *Pennisetum clandestinum* (Kikuyu).

Comments:
This vegetation community occurs in the southern parts of the site and occupies approximately 9.28 hectares. It is moderately to highly disturbed by previous activities such as, tree felling, underscrubbing, grazing and incursions of moderate to high levels of exotic weed species, especially in the ground layer.

4. Open Forest (*Corymbia maculata, Eucalyptus paniculata*)

***Structure*:**

Trees: To 25 metres in height, with a 30-60% Projected Foliage Cover (PFC).

Shrubs: To 3.5 metres in height, with 15-50% PFC.

Groundlayer: To 2 metre in height, with 30% PFC.

Floristics:

(Main Species Present)

Trees: *Corymbia maculata* (Spotted Gum), *Eucalyptus paniculata* subsp. *paniculata* (Grey Ironbark), *Eucalyptus propinqua* (Small-fruited Grey Gum), *Eucalyptus resinifera* subsp. *resinifera* (Red Mahogany) and *Eucalyptus umbra* subsp. *umbra* (Broad-leaved White Mahogany).

Shrubs: *Breynia oblongifolia* (Coffee Bush), *Pultenaea blakelyi, Pultenaea paleacea* var. *paleacea, Pultenaea villosa, Acacia ulicifolia* (Prickly Moses), *Leptospermum polygalifolium* (Yellow Tea Tree) and *Chrysanthemoides monilifera* subsp. *rotundata* (Bitou Bush).

Groundlayer: *Entolasia stricta* (Wiry Panic), *Lomandra multiflora* subsp. *multiflora* (Many-flowered Mat-rush), *Pratia purpurascens* (Whiteroot), *Echinopogon ovatus* (Forest Hedgehog Grass), *Imperata cylindrica* (Blady Grass) and *Microlaena stipoides*.

Weeds: *Axonopus fissifolius* (Narrow-leaved Carpet Grass).

Comments:

This vegetation community occurs in the north of the site on the lower to mid slopes and occupies approximately 8 hectares. Disturbances within this community include, selective logging, underscrubbing and low to moderate levels of weed invasion.

5. Open Forest (*Eucalyptus microcorys*)

***Structure*:**

Trees: To 25 metres in height, with a 5-60% Projected Foliage Cover (PFC).

Shrubs: To 3.5 metres in height, with 35-60% PFC.

Groundlayer: To 2 metre in height, with 40% PFC.

Floristics:

(Main Species Present)

Trees: *Eucalyptus microcorys* (Tallowwood), *Angophora costata* (Smooth-barked Apple), *Corymbia gummifera* (Red Bloodwood) and *Eucalyptus resinifera* subsp. *resinifera* (Red Mahogany).

Shrubs: *Leptospermum polygalifolium* (Yellow Tea Tree), *Acacia longifolia* subsp. *longifolia* (Sydney Golden Wattle), *Melaleuca sieberi, Dodonaea triquetra* (Hop Bush), *Breynia oblongifolia* (Coffee Bush), *Acacia ulicifolia* (Prickly Moses) and *Callistemon salignus* (Willow Bottlebrush).

Groundlayer: *Entolasia stricta* (Wiry Panic), *Lomandra longifolia* (Spiny-headed Mat-rush) and *Imperata cylindrica* (Blady Grass).

Weeds: *Axonopus fissifolius* (Narrow-leaved Carpet Grass).

Comments:
This community occurs as small patches in the northern parts of the site and occupies approximately 10 hectares. The canopy cover for this community is highly variable. Disturbances include a long history of agricultural use, such as grazing, selective clearing, regular underscrubbing, introduction of pasture improvement species, and construction of drainage works and farm dams. Weed invasion is high within this vegetation community.

6. Open Forest (*Eucalyptus pilularis*)

***Structure*:**

Trees: To 30 metres in height, with a highly variable 10-65% Projected Foliage Cover (PFC).

Shrubs: To 3.5 metres in height, with 45-70% PFC.

Groundlayer: To 2 metre in height, with 70% PFC.

Floristics:
(Main Species Present)

Trees: *Eucalyptus pilularis* (Blackbutt), *Angophora costata* (Smooth-barked Apple), *Banksia serrata* (Old-man Banksia), *Corymbia gummifera* (Red Bloodwood) with occasional *Eucalyptus robusta* (Swamp Mahogany).

Shrubs: *Monotoca elliptica* (Tree Broom-heath), *Pultenaea villosa, Notolaea longifolia* (Large Mock Olive) and *lantana camara* (Lantana).

Groundlayer: *Pomax umbellata* (Pomax), *Imperata cylindrica* (Blady Grass), *Gahnia sieberiana* (Red-fruited Saw-sedge), *Lomandra longifolia* (Spiky-headed Mat-rush) and *Baloskion tetraphyllum* subsp. *meiostachyum*.

Weeds: *Pinus eliottii* (Slash Pine), *Lantana camara* (Lantana), *Bidens pilosa* (Cobblers Pegs), *Setaria pumila* (Pale Pigeon Grass), *Trifolium repens* (White Clover), *Pennisetum clandestinum* (Kikuyu) and *Paspalum dilatatum* (Paspalum).

Comments:
This vegetation community occurs in several patches in the north-eastern parts of the site and occupies approximately 15 hectares. Canopy cover within this community is highly variable. Disturbances include, grazing, selective clearing, regular underscrubbing and introduction of pasture and exotic weed species.

7. Woodland (*Eucalyptus resinifera*)

***Structure*:**

Trees: To 20 metres in height, with a variable 1-25% Projected Foliage Cover (PFC).

Shrubs: To 2 metres in height (mostly less than 0.5m), with a highly variable <2 to 75% PFC.

Groundlayer: To 1.5 metres in height (large areas less than 0.4m), with a 90 - 95% PFC.

Floristics:

(Main Species Present)

Trees: *Eucalyptus resinifera* (Red Mahogany), *Eucalyptus robusta* (Swamp Mahogany), *Angophora costata* (Smooth-barked Apple), and *Eucalyptus signata* (Scribbly Gum).

Shrubs: *Melaleuca sieberi, Leptospermum polygalifolium* (Yellow Tea Tree), *Melaleuca thymifolia, Leptospermum liversidgei*, and *Callistemon pachyphyllus* (Wallum Bottlebrush).

Groundlayer: *Entolasia stricta* (Wiry Panic), *Hemarthria uncinata* (Matgrass), *Lepyrodia scariosa* (Scale Rush), *Xanthorrhoea latifolia* subsp. *latifolia* and *Aristida benthamii.*

Weeds: *Axonopus fissifolius* (Narrow-leaved Carpet Grass) and *Paspalum dilatatum* (Paspalum).

Comments:

This vegetation community occurs within large areas of the western and central parts of the site and occupies approximately 60 hectares. This community has been highly disturbed by activities such as, selective logging and underscrubbing/slashing, grazing and invasion by low to moderate levels of exotic weed species.

Variation:

- There is a low-lying area in the south-western part of this community that remains slightly wetter. This area has a modified ground layer consisting of a slightly higher cover of sedges (35%) within grasses and herbs (65%).
- The western parts of this community (approximately 30ha) are regularly slashed.
- The south-western parts of this community also has several indistinct drainage lines where sedges 60-70% are co-dominant with grasses and herbs 30-40%.
- The tree layer is absent in the slightly wetter south-western corner.

8. Woodland / Open Forest (*Eucalyptus robusta*)

***Structure*:**

Trees: 15 to 20 metres in height, with a variable 5 - 65% Projected Foliage Cover (PFC).

Shrubs: To 2 metres in height (mostly less than 0.5m), with 2 to 5% PFC.

Groundlayer: To 1.6 metres in height, with a variable 95% PFC.

Floristics:
(Main Species Present)

Trees: *Eucalyptus robusta* (Swamp Mahogany), *Melaleuca linariifolia* (Snow in Summer) and *Pinus eliottii* (Slash Pine).

Shrubs: *Melaleuca nodosa* (Ball Honey Myrtle), *Pultenaea villosa, Epacris pulchella* (NSW Coral Heath).

Groundlayer: *Entolasia stricta* (Wiry Panic), *Imperata cylindrica* (Blady Grass), *Blechnum indicum* (Swamp Water Fern), *Leersia hexandra* (Swamp Ricegrass), *Selaginella uliginosa* (Swamp Selaginella), *Baumea teretifolia* (Twigrush), *Lomandra longifolia* (Spiky-headed Mat-rush), *Dianella caerulea* var. *producta* (Blue Flax Lily) and *Baloskion tetraphyllum* subsp. *meiostachyum*.

Weeds: *Pinus eliottii* (Slash Pine), *Axonopus fissifolius* (Narrow-leaved Carpet Grass) and *Paspalum urvillei* (Vasey Grass).

Comments:
This vegetation community corresponds to the Endangered Ecological Community known as Swamp Sclerophyll Forest on Coastal Floodplains (SSFCF). This community occurs on the lowlands within a number of areas scattered throughout the lower elevations within the subject site. This community occupies approximately 36 hectares. The majority of this community is highly disturbed by previous clearing, grazing, slashing and the introduction of exotic species.

9. Woodland (*Eucalyptus signata*)

***Structure*:**

Trees: 15 to 18 metres in height, with a variable 15 - 25% Projected Foliage Cover (PFC).

Shrubs: To 2 metres in height (mostly less than 1m), with a 10 to 15% PFC.

Groundlayer: To 1.5 metres in height, with a 90 - 95% PFC.

Floristics:
(Main Species Present)

Trees: *Eucalyptus signata* (Northern Scribbly Gum) and *Angophora costata* (Smooth-barked Apple).

Shrubs: *Epacris pulchella* (NSW Coral Heath), *Leucopogon lanceolatus* and *Acacia ulicifolia* (Prickly Moses).

Groundlayer: *Trifolium repens* (White Clover), *Pteridium esculentum* (Bracken), *Axonopus fissifolius* (Narrow-leaved Carpet Grass), *Paspalum dilatatum* (Paspalum), *Pratia purpurascens* (Whiteroot), *Cynodon dactylon* (Common Couch), *Imperata cylindrica* (Blady Grass), and *Baloskion tetraphyllum* subsp. *meiostachyum*.

Weeds: *Trifolium repens* (White Clover), *Axonopus fissifolius* (Narrow-leaved Carpet Grass), *Pennisetum clandestina* (Kikuyu), *Andropogon virginicus* (Whisky Grass), *Cynodon dactylon* (Common Couch), *Lotus uliginosus* (Bird's-foot Trefoil), *Conyza sumatrensis* (Tall Fleabane) and *Paspalum dilatatum* (Paspalum).

Comments:
This vegetation community occurs within a single area in the central part of the site and occupies approximately 1 hectare. This community has been highly disturbed by activities such as, clearing of the shrub and ground layers, slashing, grazing and invasion by moderate to high levels of exotic weed species.

10. Open Forest / Woodland (*Eucalyptus umbra*)

***Structure*:**

Trees: 15 to 22 metres in height, with a variable 8 - 40% Projected Foliage Cover (PFC).

Shrubs: To 4 metres in height, with a highly variable <2 to 60% PFC.

Groundlayer: To 1.5 metres in height, with a variable 40 to 95% PFC.

Floristics:
(Main Species Present)

Trees: *Eucalyptus umbra* (Broad-leaved White Mahogany), *Eucalyptus globoidea* (White Stringybark), *Angophora costata* (Smooth-barked Apple), *Corymbia gummifera* (Red Bloodwood) and *Eucalyptus microcorys* (Tallowwood).

Shrubs: *Callistemon salignus* (Willow Bottlebrush), *Leptospermum polygalifolium* (Yellow Tea Tree), *Persoonia linearis* (Narrow-leaved Geebung) and *Lomatia silaifolia* (Crinkle Bush).

Groundlayer: *Entolasia stricta* (Wiry Panic), *Pratia purpurascens* (Whiteroot), *Imperata cylindrica* (Blady Grass), *Lomandra longifolia* (Spiky-headed Mat-rush), *Microlaena stipoides, Themeda australis* (Kangaroo Grass), *Xanthorrhoea macronema* and *Lomandra filiformis.*

Weeds: *Pinus eliottii* (Slash Pine), *Asparagus aethiopicus* (Asparagus Fern) and Lantana camara (Lantana).

Comments:
This vegetation community occurs within two areas situated on the slopes of the northern parts of the subject site and occupies approximately 4 hectares. The central-northern portion of this community has a highly disturbed structure with scattered trees over pasture, while the northernmost portion has the structure of disturbed Open Forest. Parts of this community have been highly disturbed by activities such as, felling of most of the trees (in the central-

northern patch), clearing of the shrub and ground layers, slashing, grazing and invasion by moderate levels of exotic weed species.

11. Pine Forest (*Pinus eliottii*)

***Structure*:**

Trees: To 20 metres in height, with a patchy 20% Projected Foliage Cover (PFC).

Shrubs: To 2 metres in height, with sparse <5% PFC.

Groundlayer: To 1 metre in height, with 5 to10% PFC.

Floristics:

(Main Species Present)

Trees: *Pinus eliottii* (Slash Pine).

Shrubs: *Acacia longifolia* (Sydney Golden Wattle).

Groundlayer: *Pennisetum clandestinum* (Kikuyu) and Paspalum grasses.

Weeds: *Pennisetum clandestinum* (Kikuyu), *Paspalum spp.*, *Pinus eliottii* (Slash Pine).

Comments:

This vegetation community is located in a small area in the northern part of the site and occupies approximately 1 hectare. This community has been highly disturbed by ongoing agricultural land uses and management activities such as grazing, introduction of weed species and slashing.

12. Disturbed Estuarine Vegetation

***Structure*:**

Variable - sparse grassland to open shrubland

Floristics:

(Main Species Present)

Trees: None.

Shrubs: *Chrysanthemoides monilifera* subsp. *rotundata* (Bitou Bush)

Groundlayer: *Zoysia macrantha* (Coast Couch).

Weeds: *Pennisetum clandestinum* (Kikuyu), *Paspalum spp.*, *Pinus eliottii* (Slash Pine).

Comments:

This unit includes sandy beaches (strand), accumulated stream-borne organic litter (wrack) and areas of dredge spoil. The area covered by this vegetation community is approximately 1 hectare.

13. Casuarina Forest (*Casuarina glauca*)

***Structure*:**
Low closed forest

Floristics:
(Main Species Present)
Trees: *Casuarina glauca* (Swamp Oak).

Comments:
This unit comprises essentially monospecific stands of *Casuarina glauca,* mostly growing on dredge spoil along the river's edge. The area covered by this vegetation community is approximately 1 hectare.

14. Mangroves (*Avicennia marina*)

***Structure*:** Low closed-forest to closed scrub
Trees: To 7 metres in height, with a patchy 20% Projected Foliage Cover (PFC).

Shrubs: None.

Groundlayer: None.

Floristics:
(Main Species Present)
Trees: *Avicennia marina* var. *australasica* (Grey Mangrove) and *Aegiceras corniculatum* (River Mangrove).

Shrubs: *Myoporum acuminatum* (Mangrove Boobialla).

Groundlayer: None.

Weeds: None noted.

Comments:
A variable width fringe of mangroves along the river frontage. This vegetation community occupies approximately 6 hectares in the eastern parts of the subject site.

15. Saltmarsh (*Juncus kraussii*)

***Structure*:** Closed or Open rushland, herbland
Trees: None.

Shrubs: None.

Groundlayer: From 0.1 to 1.3 metres in height, with 80 - 90% PFC.

Floristics:
(Main Species Present)
Trees: None.

Shrubs: None.

Groundlayer: *Juncus krausii* (Sea Rush), *Sarcocornia quinqueflora* (Glasswort), *Sporobolus virginicus* (Sand Couch).

Weeds: None noted.

Comments:
This vegetation community corresponds to the Endangered Ecological Community known as Coastal Saltmarsh. *Juncus kraussii* is the main saltmarsh species on the site, dominating most of the higher intertidal area. This community occupies approximately 20 hectares within the subject site.

16. Rushland (*Baumea juncea*)

***Structure*:** Closed rushland

Trees: None.

Shrubs: None.

Groundlayer: To 1.7 metres in height, with 5 to10% PFC.

Floristics:
(Main Species Present)

Trees: None.

Shrubs: None.

Groundlayer: *Baumea juncea, Juncus kraussii* (Sea Rush), *Sporobolus virginicus* (Sand Couch).

Weeds: None noted.

Comments:
This vegetation community corresponds to the Endangered Ecological Community known as Coastal Saltmarsh. The areas containing *Baumea juncea* rushland are more influenced by freshwater flows from the catchment than from tidal inundation (the latter does occur from time to time). This unit occurs in lower-lying depressions on the landward side of the Saltmarsh and occupies approximately 8 hectares.

17. Scrub (*Melaleuca ericifolia*)

***Structure*:** Closed Scrub / rushland

Trees: None.

Shrubs: To 4 metres in height, with a variable 5 to 70% PFC.

Groundlayer: To 1.5 metres in height, with a variable 5 to 70% PFC.

Floristics:
(Main Species Present)

Trees: None.

Shrubs: *Melaleuca ericifolia* (Swamp Paperbark).

Groundlayer: *Baumea juncea* and *Sporobolus virginicus* (Sand Couch).

Weeds: None noted.

Comments:
This vegetation community corresponds to the Endangered Ecological Community known as Swamp Sclerophyll Forest on Coastal Floodplains (SSFCF). This vegetation unit occurs in lower-lying depressions on the landward side of the saltmarsh, but is further removed from tidal inundation, allowing the dominance of *Melaleuca ericifolia*. Parts of this vegetation unit

contain areas of *Baumea* rushland which has been evidently infrequently slashed. The frequency of slashing has been sufficiently frequent to permit dominance by *Baumea juncea* but there is plenty of stunted *Melaleuca ericifolia.* If slashing was discontinued, these areas would readily re-establish as *Melaleuca ericifolia* scrub. This vegetation type occupies approximately 10 hectares.

18. Paperbark Forest (*Melaleuca quinquenervia*)

***Structure*:** Open Forest to Woodland

Trees: To 20 metres in height, with a patchy 20 to 60% Projected Foliage Cover (PFC).

Shrubs: To 3 metres in height, with a variable 40 to 60% PFC.

Groundlayer: To 1.7 metres in height, with a variable 40 to 70% PFC.

Floristics:

(Main Species Present)

Trees: *Melaleuca quinquenervia* (Broad-leaved Paperbark), *Casuarina glauca* (Swamp Oak) and *Eucalyptus robusta* (Swamp Mahogany).

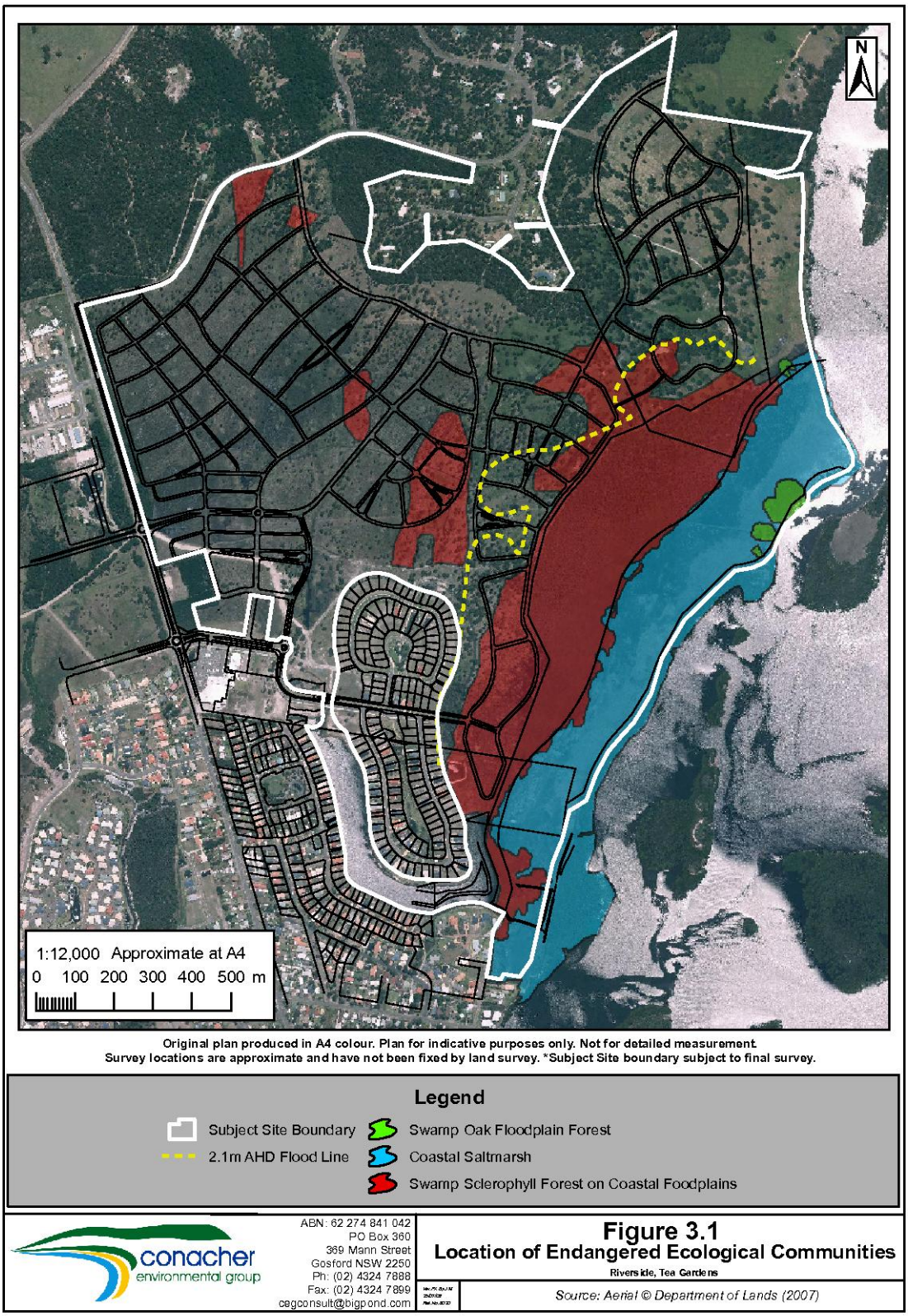
Shrubs: *Acacia longifolia* (Sydney Golden Wattle), *Leptospermum polygalifolium* (Lemon-scented Tea-tree).

Groundlayer: *Gahnia clarkei* (Tall Saw-sedge).

Weeds: None noted.

Comments:

This vegetation community corresponds to the Endangered Ecological Community known as Swamp Sclerophyll Forest on Coastal Floodplains (SSFCF). Small patches of this mixed forest dominated by *Melaleuca quinquenervia* occur in areas adjacent to the Baumea rushland where it is inferred that catchment surface flows lower the soil salinity sufficiently to give *Melaleuca quinquenervia* a competitive advantage over *Melaleuca ericifolia.* This vegetation community occupies approximately 1 hectare.


N
1:12,000 Approximate at A4
0 100 200 300 400 500 m
Original plan produced in A4 colour. Plan for indicative purposes only. Not for detailed measurement.
Survey locations are approximate and have not been fixed by land survey. *Subject Site boundary subject to final survey.
Legend
Subject Site Boundary
2.1m AHD Flood Line
Swamp Oak Floodplain Forest
Coastal Saltmarsh
Swamp Sclerophyll Forest on Coastal Floodplains
conacher environmental group
ABN: 62 274 841 042
PO Box 360
369 Mann Street
Gosford NSW 2250
Ph: (02) 4324 7888
Fax: (02) 4324 7899
cegconsult@bigpond.com
Figure 3.1
Location of Endangered Ecological Communities
Riverside, Tea Gardens
Source: Aerial © Department of Lands (2007)

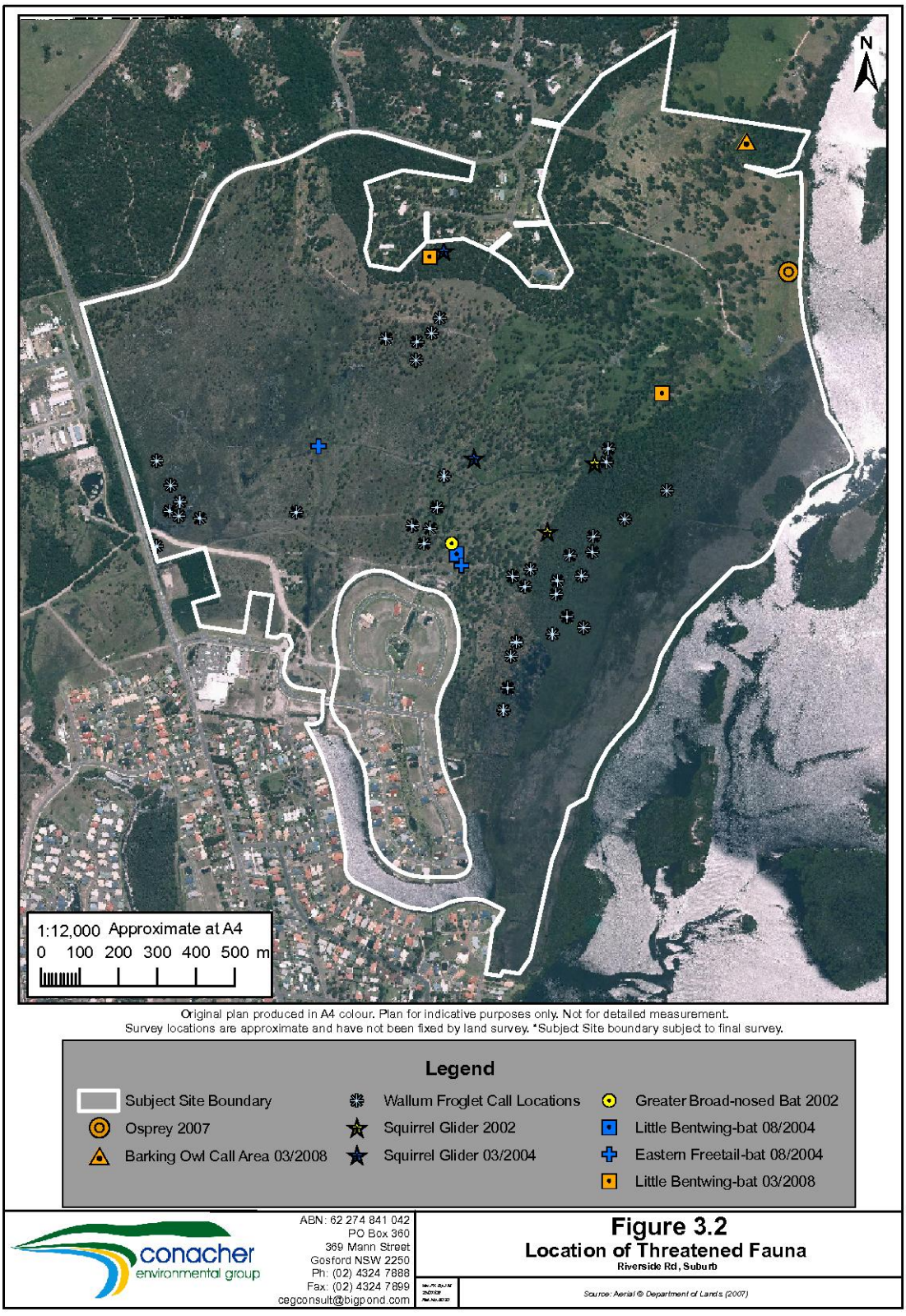

N
1:12,000 Approximate at A4
0 100 200 300 400 500 m
Original plan produced in A4 colour. Plan for indicative purposes only. Not for detailed measurement.
Survey locations are approximate and have not been fixed by land survey. *Subject Site boundary subject to final survey.
Legend
Subject Site Boundary
Osprey 2007
Barking Owl Call Area 03/2008
Wallum Froglet Call Locations
Squirrel Glider 2002
Squirrel Glider 03/2004
Greater Broad-nosed Bat 2002
Little Bentwing-bat 08/2004
Eastern Freetail-bat 08/2004
Little Bentwing-bat 03/2008
conacher environmental group
ABN: 62 274 841 042
PO Box 360
369 Mann Street
Gosford NSW 2250
Ph: (02) 4324 7888
Fax: (02) 4324 7899
cegconsult@bigpond.com
Figure 3.2
Location of Threatened Fauna
Riverside Rd, Suburb
Source: Aerial © Department of Lands (2007)

TABLE 3.1 FLORA SPECIES OBSERVED ON THE SUBJECT SITE		
Family	**Scientific Name**	**Common Name**
TREES		
Acanthaceae	*Avicennia marina* var. *australasica*	Grey Mangrove
Arecaceae	*Livistona australis*	Cabbage Palm
Casuarinaceae	*Allocasuarina littoralis*	Black Sheoak
Casuarinaceae	*Allocasuarina torulosa*	Forest Oak
Casuarinaceae	*Casuarina glauca*	Swamp Oak
Elaeocarpaceae	*Elaeocarpus reticulatus*	Blueberry Ash
Euphorbiaceae	*Glochidion ferdinandii*	Cheese Tree
Fabaceae	*Acacia schinoides*	Green Cedar Wattle
Lauraceae	*Cinnamomum camphora**	Camphor Laurel
Lauraceae	*Endiandra sieberi*	Hard Corkwood
Meliaceae	*Synoum glandulosum subsp. glandulosum*	Scentless Rosewood
Mimosaceae	*Acacia irrorata* subsp. *irrorata*	Green Wattle
Moraceae	*Ficus rubiginosa*	Port Jackson Fig
Moraceae	*Ficus sp. (Seedling)*	A Fig
Myoporaceae	*Myoporum acuminatum*	Mangrove Boobialla
Myrsinaceae	*Aegiceras corniculatum*	River Mangrove
Myrsinaceae	*Aegiceras corniculatum*	River Mangrove
Myrtaceae	*Acmena smithii*	Lillypilly
Myrtaceae	*Angophora costata*	Smooth-barked Apple
Myrtaceae	*Corymbia gummifera*	Red Bloodwood
Myrtaceae	*Corymbia maculata*	Spotted Gum
Myrtaceae	*Eucalyptus canaliculata*	Large-fruited Grey Gum
Myrtaceae	*Eucalyptus capitellata*	Brown Stringybark
Myrtaceae	*Eucalyptus eugenioides*	Thin-leaved Stringybark
Myrtaceae	*Eucalyptus fergusonii*	-
Myrtaceae	*Eucalyptus globoidea*	White Stringybark
Myrtaceae	*Eucalyptus microcorys*	Tallowwood
Myrtaceae	*Eucalyptus paniculata subsp. paniculata*	Grey Ironbark
Myrtaceae	*Eucalyptus pilularis*	Blackbutt
Myrtaceae	*Eucalyptus propinqua* var. *propinqua*	Small Fruited Grey Gum
Myrtaceae	*Eucalyptus punctata*	Grey Gum
Myrtaceae	*Eucalyptus resinifera subsp. resinifera*	Red Mahogany
Myrtaceae	*Eucalyptus robusta*	Swamp Mahogany

TABLE 3.1 (Cont.) FLORA SPECIES OBSERVED ON THE SUBJECT SITE		
Family	**Scientific Name**	**Common Name**
TREES (Cont.)		
Myrtaceae	*Eucalyptus siderophloia*	Northern Grey Ironbark
Myrtaceae	*Eucalyptus signata*	Northern Scribbly Gum
Myrtaceae	*Eucalyptus tereticornis*	Forest Red Gum
Myrtaceae	*Eucalyptus umbra*	Broad-leaved White Mahogany
Myrtaceae	*Melaleuca linariifolia*	Snow in Summer
Myrtaceae	*Melaleuca quinquenervia*	Broad-leaved Paperbark
Myrtaceae	*Melaleuca stypheloides*	Prickly-leaved Tea Tree
Oleaceae	*Notelaea venosa*	Veined Mock Olive
Pinaceae	*Pinus elliottii**	Slash Pine
Pittosporaceae	*Pittosporum undulatum*	Sweet Pittosporum
Proteaceae	*Banksia serrata*	Old-man Banksia
Santalaceae	*Exocarpos cupressiformis*	Native Cherry
SHRUBS		
Apiaceae	*Platysace ericoides*	Heathy Platysace
Apiaceae	*Platysace lanceolata*	Native Parsnip
Apiaceae	*Platysace lanceolata*	Lance-leaf Platysace
Apiaceae	*Platysace linearifolia*	Narrow-leafed Platysace
Apocynaceae	*Gomphocarpus fruticosus**	Narrow-leaved Cotton Bush
Araliaceae	*Polyscias sambucifolia subsp. sambucifolia*	Elderberry Panax
Asteraceae	*Chrysanthemoides monilifera* subsp. *monilifera**	Bitou Bush
Asteraceae	*Chrysanthemoides monilifera subsp. rotundata*	Bitou Bush
Asteraceae	*Olearia elliptica*	-
Asteraceae	*Ozothamnus diosmifolius*	Ball Everlasting
Cactaceae	*Opuntia stricta var. stricta**	Common Prickly Pear
Cesalpinioideae	*Senna pendula* var. *glabrata**	-
Dilleniaceae	*Hibbertia linearis*	-
Dilleniaceae	*Hibbertia obtusifolia*	-
Dilleniaceae	*Hibbertia serpyllifolia*	-
Dilleniaceae	*Hibbertia* sp aff. *Riparia*	-
Epacridaceae	*Epacris microphylla*	Coral Heath
Epacridaceae	*Epacris obtusifolia*	-
Epacridaceae	*Leucopogon ericoides*	-
Epacridaceae	*Leucopogon lanceolatus*	Lance-leaf Beard-heath
Epacridaceae	*Monotoca scoparia*	Prickly Broom-heath

TABLE 3.1 (Cont.) FLORA SPECIES OBSERVED ON THE SUBJECT SITE		
Family	**Scientific Name**	**Common Name**
SHRUBS (Cont.)		
Ericaceae	*Epacris pulchella*	NSW Coral Heath
Ericaceae	*Leucopogon juniperinus*	Prickly Beard-heath
Ericaceae	*Lissanthe strigosa*	Peach Heath
Ericaceae	*Monotoca elliptica*	Tree Broom-heath
Euphorbiaceae	*Amperea xiphoclada*	Broom Spurge
Euphorbiaceae	*Breynia oblongifolia*	Coffee Bush
Euphorbiaceae	*Micrantheum ericoides*	-
Euphorbiaceae	*Omalanthus populifolius*	Bleeding Heart
Euphorbiaceae	*Phyllanthus hirtellus*	Thyme Spurge
Euphorbiaceae	*Ricinocarpos pinifolius*	Wedding Bush
Fabaceae	*Bossiaea rhombifolia*	-
Fabaceae	*Daviesia ulicifolia*	Gorse Bitter Pea
Fabaceae	*Daviesia ulicifolia* subsp, *stenophylla*	Gorse Bitter Pea
Fabaceae	*Gompholobium latifolium*	Broad-leaf Wedge-pea
Fabaceae	*Mirbelia speciosa*	-
Fabaceae	*Platylobium formosum* subsp. *parviflorum*	Handsome Flat-pea
Fabaceae	*Pultenaea blakelyi*	-
Fabaceae	*Pultenaea daphnoides*	Large-leaf Bush Pea
Fabaceae	*Pultenaea elliptica*	-
Fabaceae	*Pultenaea paleacea* var. *paleacea*	-
Fabaceae	*Pultenaea retusa*	-
Fabaceae	*Pultenaea rosmarinifolia*	-
Fabaceae	*Pultenaea villosa*	-
Fabaceae	*Viminaria juncea*	Native Broom
Fabaceae	*Bossiaea heterophylla*	Variable Bossiaea
Fabaceae	*Dillwynia retorta var. retorta*	Heathy Parrot Pea
Fabaceae	*Platylobium formosum*	Handsome Flat-pea
Faboideae	*Aotus lanigera*	-
Faboideae	*Phyllota phylicoides*	Heath Phyllota
Goodeniaceae	*Goodenia ovata*	Hop Goodenia
Lamiaceae	*Clerodendrum tomentosum*	Hairy Clerodendrum
Mimosaceae	*Acacia binervia*	Coast Myall
Mimosaceae	*Acacia elongata*	-
Mimosaceae	*Acacia falcata*	Sickle Wattle
Mimosaceae	*Acacia implexa*	Hickory
Mimosaceae	*Acacia longifolia* var. *longifolia*	Sydney Golden Wattle

TABLE 3.1 (Cont.) FLORA SPECIES OBSERVED ON THE SUBJECT SITE		
Family	**Scientific Name**	**Common Name**
SHRUBS (Cont.)		
Mimosaceae	*Acacia longifolia* var. *sophorae*	-
Mimosaceae	*Acacia myrtifolia*	Red Stem Wattle
Mimosaceae	*Acacia suaveolens*	Sweet Scented Wattle
Mimosaceae	*Acacia terminalis*	Sunshine Wattle
Mimosaceae	*Acacia ulicifolia*	Prickly Moses
Myrsinaceae	*Rapanea variabilis*	Muttonwood
Myrtaceae	*Babingtonia pluriflora*	-
Myrtaceae	*Callistemon citrinus*	Crimson Bottlebrush
Myrtaceae	*Callistemon linearis*	Narrow-leaved Bottlebrush
Myrtaceae	*Callistemon pachyphyllus*	Wallum Bottlebrush
Myrtaceae	*Callistemon pinifolius*	Pine-leaved Bottlebrush
Myrtaceae	*Callistemon salignus*	Willow Bottlebrush
Myrtaceae	*Kunzea ambigua*	Tick Bush
Myrtaceae	*Leptospermum juniperinum*	Prickly Tea-tree
Myrtaceae	*Leptospermum laevigatum*	Coast Tea Tree
Myrtaceae	*Leptospermum liversidgei*	-
Myrtaceae	*Leptospermum polygalifolium*	Lemon Scented Tea-tree
Myrtaceae	*Leptospermum trinervium*	Flaky-barked Tea-tree
Myrtaceae	*Melaleuca ericifolia*	Swamp Paperbark
Myrtaceae	*Melaleuca nodosa*	Ball Honeymyrtle
Myrtaceae	*Melaleuca sieberi*	-
Myrtaceae	*Melaleuca thymifolia*	Thyme Honey Myrtle
Oleaceae	*Notelaea longifolia*	Large Mock-olive
Oleaceae	*Notelaea ovata*	-
Phytolaccaceae	*Phytolacca octandra**	Inkweed
Pittosporaceae	*Pittosporum revolutum*	Rough Fruit Pittosporum
Polygalaceae	*Comesperma ericinum*	Matchheads
Proteaceae	*Banksia aemula*	Wallum Banksia
Proteaceae	*Banksia ericifolia* var. *ericifolia*	Heath-leaved Banksia
Proteaceae	*Banksia integrifolia* subsp. *integrifolia*	Coast Banksia
Proteaceae	*Banksia oblongifolia*	Fern-leaved Banksia
Proteaceae	*Banksia robur*	Wallum Banksia
Proteaceae	*Banksia spinulosa* var. *collina*	Hairpin Banksia
Proteaceae	*Banksia spinulosa* var. *spinulosa*	-
Proteaceae	*Hakea dactyloides*	Broad-leaved Hakea
Proteaceae	*Hakea sericea*	Needlebush
Proteaceae	*Hakea teretifolia*	Dagger Hakea
Proteaceae	*Persoonia lanceolata*	Lance Leaf Geebung

TABLE 3.1 (Cont.) FLORA SPECIES OBSERVED ON THE SUBJECT SITE		
Family	**Scientific Name**	**Common Name**
SHRUBS (Cont.)		
Proteaceae	*Persoonia levis*	Broad-leaved Geebung
Proteaceae	*Persoonia linearis*	Narrow-leaved Geebung
Rosaceae	*Rubus moluccanus*	Broad-leaf Bramble
Rubiaceae	*Opercularia aspera*	Common Stinkweed
Rubiaceae	*Opercularia diphylla*	-
Rutaceae	*Boronia pinnata*	Pinnate Boronia
Rutaceae	*Nematolepis squamea subsp. squamea*	Satinwood
Rutaceae	*Zieria smithii*	Sandfly Zieria
Santalaceae	*Leptomeria acida*	Sour Currant Bush
Sapindaceae	*Dodonaea triquetra*	Large-leaf Hop-bush
Solanaceae	*Duboisia myoporoides*	Corkwood
Solanaceae	*Solanum mauritianum**	Wild Tobacco Bush
Verbenaceae	*Lantana camara**	Lantana
Zamiaceae	*Macrozamia communis*	Burrawang
Zamiaceae	*Macrozamia pauli-guilielmi*	-
GROUNDCOVERS		
Acanthaceae	*Pseuderanthemum variabile*	Pastel Flower
Adiantaceae	*Adiantum aethiopicum*	Common Maidenhair
Aizoaceae	*Tetragonia tetragonioides*	New Zealand Spinach
Amaranthaceae	*Alternanthera denticulata*	Lesser Joyweed
Anthericaceae	*Caesia parviflora* var. *parviflora*	Pale Grass Lily
Anthericaceae	*Thysanotus tuberosus*	Common Fringe-lily
Anthericaceae	*Tricoryne elatior*	Yellow Autumn-lily
Apiaceae	*Centella asiatica*	Pennywort
Apiaceae	*Hydrocotyle bonariensis**	Kurnell Curse / Pennywort
Apiaceae	*Hydrocotyle peduncularis*	Pennywort
Apiaceae	*Xanthosia pilosa*	Woolly Xanthosia
Asparagaceae	*Asparagus aethiopicus**	Asparagus Fern
Asteraceae	*Actinotus helianthi*	Flannel Flower
Asteraceae	*Ageratina adenophorum**	Crofton Weed
Asteraceae	*Aster subulatus**	Wild Aster
Asteraceae	*Bidens pilosa**	Cobbler's Pegs
Asteraceae	*Centipeda minima*	Spreading Sneezeweed
Asteraceae	*Cirsium vulgare**	Spear Thistle
Asteraceae	*Conyza bonariensis**	Flaxleaf Fleabane
Asteraceae	*Conyza* sp.*	-

TABLE 3.1 (Cont.) FLORA SPECIES OBSERVED ON THE SUBJECT SITE		
Family	**Scientific Name**	**Common Name**
GROUNDCOVERS (Cont.)		
Asteraceae	*Conyza sumatrensis**	Tall fleabane
Asteraceae	*Cotula coronopifolia**	Waterbuttons
Asteraceae	*Crassocephalum crepidioides**	Thickhead
Asteraceae	*Epaltes australis*	Spreading Nut-heads
Asteraceae	*Erechtites valerianifolia**	Brazilian Fireweed
Asteraceae	*Euchiton involucratus*	Star Cudweed
Asteraceae	*Euchiton sphaericus*	Cudweed
Asteraceae	*Hypochaeris radicata**	Flatweed
Asteraceae	*Lagenifera stipitata*	Blue Bottle-daisy
Asteraceae	*Senecio diaschides*	-
Asteraceae	*Senecio lautus* ssp. *dissectifolius*	Fireweed
Asteraceae	*Senecio lautus* subsp. *maritimus*	-
Asteraceae	*Senecio madagascariensis**	Fireweed
Asteraceae	*Sigesbeckia orientalis subsp. orientalis*	Indian Weed
Asteraceae	*Sonchus oleraceus**	Common Sow-thistle
Asteraceae	*Taraxacum officinale**	Dandelion
Asteraceae	*Vernonia cinerea var. cinerea*	-
Baueraceae	*Bauera rubioides*	Dog Rose
Bignoniaceae	*Pandorea pandorana*	Wonga Wonga Vine
Blandfordiaceae	*Blandfordia grandiflora*	Christmas Bell
Blechnaceae	*Blechnum cartilagineum*	Gristle Fern
Blechnaceae	*Blechnum indicum*	Swamp Water Fern
Blechnaceae	*Doodia aspera*	Prickly Rasp Fern
Brassicaceae	*Capsella bursa-pastoris**	Shepherds purse
Campanulaceae	*Wahlenbergia gracilis*	Australian Bluebell
Campanulaceae	*Wahlenbergia stricta* subsp. *stricta*	Austral Bluebell
Carophyllaceae	*Cerastium glomeratum**	Mouse-ear Chickweed
Caryophyllaceae	*Stellaria media**	Common Chickweed
Chenopodiaceae	*Einadia hastata*	Berry Saltbush
Chenopodiaceae	*Einadia polygonoides*	-
Chenopodiaceae	*Sarcocornia quinqueflora*	Glasswort
Clusiaceae	*Hypericum gramineum*	Small St Johns Wort
Clusiaceae	*Hypericum japonicum*	-
Clusiaceae	*Hypericum perforatum**	St Johns Wort
Colchicaceae	*Burchardia umbellata*	Milkmaids
Commelinaceae	*Commelina cyanea*	Native Wandering Jew
Commelinaceae	*Murdannia graminea*	-

TABLE 3.1 (Cont.) FLORA SPECIES OBSERVED ON THE SUBJECT SITE		
Family	**Scientific Name**	**Common Name**
GROUNDCOVERS (Cont.)		
Convolvulaceae	*Dichondra repens*	Kidney Weed
Convolvulaceae	*Polymeria calycina*	Polymeria
Cyperaceae	*Baumea arthrophylla*	White Fruited Twig Rush
Cyperaceae	*Baumea articulata*	Jointed Twig-rush
Cyperaceae	*Baumea juncea*	-
Cyperaceae	*Baumea rubignosa*	Twig Rush
Cyperaceae	*Baumea teretifolia*	A Twigrush
Cyperaceae	*Bolboschoenus fluviatilis*	Marsh Clubrush
Cyperaceae	*Carex appressa*	Tall Sedge
Cyperaceae	*Caustis flexuosa*	Curly Sedge
Cyperaceae	*Chorizandra cymbaria*	Heron Bristle Rush
Cyperaceae	*Chorizandra sphaerocephala*	Round-headed Bristle Rush
Cyperaceae	*Cyperus aggregatus**	-
Cyperaceae	*Cyperus brevifolius**	-
Cyperaceae	*Cyperus difformis*	-
Cyperaceae	*Cyperus eragrostis**	Umbrella Sedge
Cyperaceae	*Cyperus gracilis*	Slender Flat-sedge
Cyperaceae	*Cyperus polystachyos*	A Sedge
Cyperaceae	*Cyperus sesquiflorus**	-
Cyperaceae	*Eleocharis pusilla*	-
Cyperaceae	*Fimbristylis dichotoma*	Common Fringe-sedge
Cyperaceae	*Gahnia aspera*	Rough Saw-sedge
Cyperaceae	*Gahnia clarkei*	Tall Saw-sedge
Cyperaceae	*Gahnia sieberiana*	Red-fruit Saw-sedge
Cyperaceae	*Isolepis inundata*	Swamp Clubrush
Cyperaceae	*Isolepis nodosa*	Knobby Club-rush
Cyperaceae	*Lepidosperma elatius*	Tall Sword-sedge
Cyperaceae	*Lepidosperma laterale*	Variable Sword-sedge
Cyperaceae	*Ptilothrix deusta*	-
Cyperaceae	*Schoenus apogon*	Fluke Bogrush
Cyperaceae	*Schoenus brevifolius*	A Bog Rush
Cyperaceae	*Schoenus ericetorum*	A Bog Rush
Cyperaceae	*Schoenus melanostachys*	Black Bog Rush
Dennstaedtiaceae	*Histiopteris incisa*	Bat's Wing Fern
Dennstaedtiaceae	*Hypolepis muelleri*	Harsh Ground Fern
Dennstaedtiaceae	*Pteridium esculentum*	Bracken
Dicksoniaceae	*Calochlaena dubia*	False Bracken
Dilleniaceae	*Hibbertia acicularis*	Prickly Guinea Flower

TABLE 3.1 (Cont.) FLORA SPECIES OBSERVED ON THE SUBJECT SITE		
Family	**Scientific Name**	**Common Name**
GROUNDCOVERS (Cont.)		
Dilleniaceae	*Hibbertia aspera*	Rough Guinea Flower
Dilleniaceae	*Hibbertia empetrifolia* subsp. *uncinata*	-
Dilleniaceae	*Hibbertia fasciculata*	-
Dilleniaceae	*Hibbertia vestita*	-
Dilleniaceae	*Hibbertia virgata subsp. virgata*	-
Droseraceae	*Drosera peltata*	Pygmy Sundew
Droseraceae	*Drosera pygmaea*	Pygmy Sundew
Droseraceae	*Drosera spatulata*	Common Sundew
Elaeocarpaceae	*Tetratheca thymifolia*	Black-eyed Susan
Eriocaulaceae	*Eriocaulon scariosum*	Salt Pipewort, Button Grass
Euphorbiaceae	*Phyllanthus tenellus**	-
Euphorbiaceae	*Poranthera microphylla*	
Fabaceae	*Acacia brownii*	Heath Wattle
Fabaceae	*Bossiaea prostrata*	-
Fabaceae	*Gompholobium pinnatum*	Pinnate Wedge Pea
Fabaceae	*Lotus uliginosus**	Birds-foot Trefoil
Fabaceae	*Trifolium repens**	White Clover
Gentianaceae	*Centaurium erythraea**	Pink Stars
Geraniaceae	*Geranium homeanum*	Northern Cranesbill
Geraniaceae	*Geranium solanderi*	Cutleaf Cranesbill
Gleicheniaceae	*Gleichenia dicarpa*	Pouched Coral Fern
Goodeniaceae	*Dampiera stricta*	Blue Damperia
Goodeniaceae	*Goodenia bellidifolia subsp. bellidifolia*	Daisy-leaved Goodenia
Goodeniaceae	*Goodenia heterophylla subsp. heterophylla*	Variable-leaved Goodenia
Goodeniaceae	*Goodenia paniculata*	Swamp Goodenia
Goodeniaceae	*Goodenia stelligera*	-
Goodeniaceae	*Scaevola ramosissima*	Purple Fan Flower
Haemodoraceae	*Haemodorum planifolium*	Bloodroot
Haloragaceae	*Gonocarpus micranthus* subsp. *micranthus*	-
Haloragaceae	*Gonocarpus micranthus subsp. ramosissimus*	-
Haloragaceae	*Gonocarpus tetragynus*	Poverty Raspwort
Haloragaceae	*Gonocarpus teucrioides*	Raspwort
Haloragaceae	*Haloragis heterophylla*	-
Haloragaceae	*Myriophyllum propinquum*	Common Water Milfoil

TABLE 3.1 (Cont.) FLORA SPECIES OBSERVED ON THE SUBJECT SITE		
Family	**Scientific Name**	**Common Name**
GROUNDCOVERS (Cont.)		
Hypoxidaceae	*Hypoxis hygrometrica*	Golden Weather-grass
Iridaceae	*Crocosmia X crocosmiiflora**	Montbretia
Iridaceae	*Patersonia glabrata*	Leafy Purple-flag
Iridaceae	*Patersonia sericea*	Silky Purple-Flag
Juncaceae	*Juncus cognatus**	-
Juncaceae	*Juncus continuus*	A Rush
Juncaceae	*Juncus krausii*	Sea Rush
Juncaceae	*Juncus kraussii*	Sea Rush
Juncaceae	*Juncus planifolius*	Broad Rush
Juncaceae	*Juncus polyanthemus*	-
Juncaceae	*Juncus prismatocarpus*	Branching Rush
Juncaceae	*Juncus usitatus*	Common Rush
Juncaginaceae	*Triglochin striata*	Streaked Arrow-grass
Lamiaceae	*Stachys arvensis**	Stagger Weed
Lentibulariaceae	*Utricularia dichotoma*	Fairy aprons
Lindsaeaceae	*Lindsaea linearis*	Screw Fern
Lindsaeaceae	*Lindsaea microphylla*	Lacy Wedge Fern
Lobeliaceae	*Lobelia alata*	Angled Lobelia
Lobeliaceae	*Pratia purpurascens*	Whiteroot
Loganiaceae	*Mitrasacme paludosa*	-
Loganiaceae	*Mitrasacme polymorpha*	-
Lomandraceae	*Lomandra confertifolia*	-
Lomandraceae	*Lomandra confertifolia* subsp. *rubiginosa*	-
Lomandraceae	*Lomandra confertifolia var. pallida*	-
Lomandraceae	*Lomandra cylindrica*	-
Lomandraceae	*Lomandra filiformis* var. *filiformis*	Wattle Mat-rush
Lomandraceae	*Lomandra glauca subsp. glauca*	Pale Mat-rush
Lomandraceae	*Lomandra longifolia*	Spiny-headed Mat-rush
Lomandraceae	*Lomandra multiflora subsp. multiflora*	Many-flowered Mat-rush
Lomandraceae	*Lomandra obliqua*	Twisted Mat-rush
Lycopodiaceae	*Lycopodium laterale*	Slender Clubmoss
Lythraceae	*Lythrum hyssopifolia*	Loosestrife
Malvaceae	*Sida rhombifolia**	Paddy's Lucerne
Menyanthaceae	*Villarsia exaltata*	Yellow Marsh Flower
Orchidaceae	*Acianthus fornicatus*	Pixie Caps

TABLE 3.1 (Cont.) FLORA SPECIES OBSERVED ON THE SUBJECT SITE		
Family	**Scientific Name**	**Common Name**
GROUNDCOVERS (Cont.)		
Orchidaceae	*Caladenia alba*	Finger Orchid
Orchidaceae	*Calochilus campestris*	Copper Beards
Orchidaceae	*Chiloglottis sp.*	-
Orchidaceae	*Cryptostylis erecta*	Bonnet Orchid
Orchidaceae	*Cryptostylis Sp. (Leaf only)*	A Tongue Orchid
Orchidaceae	*Cryptostylis subulata*	Large Tongue Orchid
Orchidaceae	*Pterostylis longifolia*	-
Orchidaceae	*Pterostylis pedunculata*	-
Orchidaceae	*Thelymitra purpurata*	Sun Orchid
Oxalidaceae	*Oxalis corniculata**	Yellow Wood Sorrel
Oxalidaceae	*Oxalis exilis*	Slender xalis
Oxalidaceae	*Oxalis sp.*	-
Phormiaceae	*Dianella caerulea* var. *assera*	Flax Lily
Phormiaceae	*Dianella caerulea var. caerulea*	Blue Flax lily
Phormiaceae	*Dianella caerulea var. producta*	Blue Flax lily
Phylydraceae	*Phylidrum lanuginosum*	Woolly Frogsmouth
Plantaginaceae	*Plantago lanceolata**	Ribwort
Plantaginaceae	*Plantago major**	Large Plantain
Poaceae	*Andropogon virginicus**	Whisky Grass
Poaceae	*Anisopogon avenaceus*	Oat Speargrass
Poaceae	*Aristida benthamii*	Wire Grass
Poaceae	*Aristida sp.*	Three-awn Speargrass
Poaceae	*Aristida vagans*	Threeawn Speargrass
Poaceae	*Austrodanthonia sp.*	Wallaby Grass
Poaceae	*Austrodanthonia tenuior*	-
Poaceae	*Austrostipa scabra subsp. scabra*	A Speargrass
Poaceae	*Axonopus affinis**	Narrow-leaved Carpet Grass
Poaceae	*Axonopus fissifolius**	Narrow-leaved Carpet Grass
Poaceae	*Briza maxima**	Quaking Grass
Poaceae	*Chloris gayana**	Rhodes Grass
Poaceae	*Chloris truncata**	Windmill Grass
Poaceae	*Cortaderia selloana**	Pampas Grass
Poaceae	*Cymbopogon refractus*	Barbed Wire Grass
Poaceae	*Cynodon dactylon*	Common Couch
Poaceae	*Dichelachne micrantha*	Shorthair Plumegrass
Poaceae	*Dichelachne rara*	-

TABLE 3.1 (Cont.) FLORA SPECIES OBSERVED ON THE SUBJECT SITE		
Family	**Scientific Name**	**Common Name**
GROUNDCOVERS (Cont.)		
Poaceae	*Digitaria parviflora*	Small-flowered Finger Grass
Poaceae	*Digitaria sanguinalis**	Crab Grass
Poaceae	*Echinopogon caespitosus var. caespitosus*	Tufted Hedgehog Grass
Poaceae	*Echinopogon ovatus*	Forest Hedgehog Grass
Poaceae	*Ehrharta erecta**	Panic Veldtgrass
Poaceae	*Entolasia marginata*	Bordered Panic
Poaceae	*Entolasia stricta*	Wiry Panic
Poaceae	*Eragrostis brownii*	Brown's Lovegrass
Poaceae	*Eragrostis curvula**	African Lovegrass
Poaceae	*Eragrostis leptostachya*	Paddock Lovegrass
Poaceae	*Hemarthria uncinata var. uncinata*	Matgrass
Poaceae	*Imperata cylindrica* var. *major*	Blady Grass
Poaceae	*Isachaemum australe* var. *australe*	-
Poaceae	*Leersia hexandra*	Swamp Ricegrass
Poaceae	*Microlaena stipoides* var. *stipoides*	Weeping Rice Grass
Poaceae	*Oplismenus aemulus*	Basket Grass
Poaceae	*Oplismenus imbecillis*	-
Poaceae	*Panicum effusum*	Hairy Panic
Poaceae	*Panicum simile*	Two-colour Panic
Poaceae	*Paspalidium distans*	-
Poaceae	*Paspalum dilatatum**	Paspalum
Poaceae	*Paspalum distichum*	Water Couch
Poaceae	*Paspalum orbiculare*	Ditch Millet
Poaceae	*Paspalum urvillei**	Vasey Grass
Poaceae	*Paspalum wettsteinii**	Broad-leaved Paspalum
Poaceae	*Pennisetum alopecuroides**	Swamp Foxtail
Poaceae	*Pennisetum clandestinum**	Kikuyu Grass
Poaceae	*Phalaris aquatica**	Phalaris
Poaceae	*Phragmites australis*	Common Reed
Poaceae	*Poa affinis*	-
Poaceae	*Poa poiformis*	Coast Tussock Grass
Poaceae	*Setaria pumila**	Pale Pigeon Grass
Poaceae	*Sporobolus creber*	Slender Rat's Tail Grass
Poaceae	*Sporobolus virginicus*	Sand Couch
Poaceae	*Stenotaphrum secundatum**	Buffalo Grass

TABLE 3.1 (Cont.) FLORA SPECIES OBSERVED ON THE SUBJECT SITE		
Family	**Scientific Name**	**Common Name**
GROUNDCOVERS (Cont.)		
Poaceae	*Themeda australis*	Kangaroo Grass
Polygonaceae	*Persicaria decipiens*	Slender Knotweed
Polygonaceae	*Rumex bidens*	Mud Dock
Portulacaceae	*Portulaca oleracea*	Purslane
Primulaceae	*Anagallis arvensis var. arvensis**	Scarlet Pimpernel
Primulaceae	*Anagallis arvensis var. caerulea**	Blue Pimpernel
Proteaceae	*Lomatia silaifolia*	Crinkle Bush
Ranunculaceae	*Ranunculus inundatus*	River Buttercup
Ranunculaceae	*Ranunculus sp.*	-
Restionaceae	*Baloskion pallens*	-
Restionaceae	*Baloskion tetraphyllum subsp. meiostachyum*	-
Restionaceae	*Empodisma minus*	Spreading Rope-rush
Restionaceae	*Leptocarpus tenax*	Slender Twine-rush
Restionaceae	*Lepyrodia muelleri*	Scale Rush
Restionaceae	*Lepyrodia scariosa*	Scale Rush
Rubiaceae	*Galium propinquum*	Maori Bedstraw
Rubiaceae	*Opercularia varia*	Variable Stinkweed
Rubiaceae	*Pomax umbellata*	Pomax
Scrophulariaceae	*Veronica plebia*	Creeping Speedwell
Selaginellaceae	*Selaginella uliginosa*	Swamp Selaginella
Solanaceae	*Solanum nigrum**	Black-berry Nightshade
Stackhousiae	*Stackhousia viminea*	-
Stylidiaceae	*Stylidium graminifolium*	Grass Triggerplant
Theophrastaceae	*Samolus repens*	Creeping Brookweed
Thymelaeaceae	*Pimelea linifolia* subsp. *linifolia*	Slender Rice Flower
Typhaceae	*Typha orientalis*	Cumbungi
Verbenaceae	*Verbena bonariensis**	Purpletop
Verbenaceae	*Verbena rigida**	Veined Verbena
Violaceae	*Hybanthus monopetalus*	Slender Violet-bush
Violaceae	*Viola banksii*	-
Violaceae	*Viola hederacea*	Ivy-leaved Violet
Xanthorrhoaceae	*Xanthorrhoea latifolia* subsp. *latifolia*	-
Xanthorrhoaceae	*Xanthorrhoea minor* subsp. *minor*	-
Xanthorrhoeaceae	*Xanthorrhoea fulva*	Swamp Grasstree
Xanthorrhoeaceae	*Xanthorrhoea macronema*	-
Xyridaceae	*Xyris complanata*	-

TABLE 3.1 (Cont.) FLORA SPECIES OBSERVED ON THE SUBJECT SITE		
Family	**Scientific Name**	**Common Name**
GROUNDCOVERS (Cont.)		
Xyridaceae	*Xyris gracilis*	Slender Yellow-eye
Xyridaceae	*Xyris operculata*	Tall Yellow-eye
EPIPHYTES		
Loranthaceae	*Amyema congener*	A mistletoe
Orchidaceae	*Cymbidium suave*	Native Cymbidium
CLIMBERS		
Apocynaceae	*Parsonsia straminea*	Common Silkpod
Asclepiadaceae	*Marsdenia rostrata*	Common Milk Vine
Asclepiadaceae	*Marsdenia suaveolens*	Scented Marsdenia
Dilleniaceae	*Hibbertia scandens*	Climbing Guinea Flower
Fabaceae	*Desmodium brachypodum*	Large Tick-trefoil
Fabaceae	*Desmodium varians*	-
Fabaceae	*Glycine clandestina*	Twining Glycine
Fabaceae	*Hardenbergia violacea*	False Sarsparilla
Fabaceae	*Kennedia rubicunda*	Dusky Coral Pea
Fabaceae	*Desmodium gunnii*	Slender tick trefoil
Fabaceae	*Desmodium rhytidophyllum*	-
Fabaceae	*Glycine microphylla*	-
Fabaceae	*Glycine tabacina*	-
Lauraceae	*Cassytha glabella* forma *glabella*	Slender Devil's Twine
Lauraceae	*Cassytha pubescens*	Common Devil's Twine
Luzuriagaceae	*Eustrephus latifolius*	Wombat Berry
Luzuriagaceae	*Geitonoplesium cymosum*	Scrambling Lily
Menispermaceae	*Sarcopetalum harveyanum*	Pearl Vine
Menispermaceae	*Stephania japonica var. discolor*	Snake Vine
Pittosporaceae	*Billardiera scandens*	Appleberry
Ranunculaceae	*Clematis aristata*	Old Man's Beard
Smilacaceae	*Smilax australis*	Lawyer Vine
Smilacaceae	*Smilax glyciphylla*	Sweet Sarsparilla
Vitaceae	*Cayratia clematidea*	Slender Grape
Species name^{TS} = Threatened Species * = Introduced Species		

3.1.2 Flora Species

The flora species identified on the subject site are listed in Table 3.1. This list is a combination of all flora surveys conducted on the subject site by different botanists over the last 15 years. No specific quadrat based data is available for the pre 2008 surveys. The results of the transect and quadrat based survey following the DEC Draft Guidelines (DEC 2004) for the 2008 surveys are also provided in Annexure 1.

3.1.3 Local and Regional Connectivity of Vegetation

The subject site is bordered to the west by the Myall Road, disturbed grasslands with scattered trees, industrial and residential development; to the south, by predominately existing residential and commercial development; to the east, by the Myall River; and to the north, by a mixture of open forest vegetation communities, areas of isolated residential development and agricultural lands.

The majority of the vegetation of the site forms a mosaic of highly disturbed woodland with scattered trees and woodland/open forest communities. However, the eastern portion of the subject site is dominated by a large remnant of naturally vegetated Swamp Forests, Heaths and Estuarine vegetation communities associated with the low lying areas adjoining the Myall River. This remnant is largely isolated from adjoining vegetation to the south by existing residential development and to the north of the site by an area of cleared agricultural land. Connectivity of vegetation within the remnant is generally provided by the isolated canopies of the trees present which form a woodland to open forest canopy.

The northern areas of the subject site are dominated by a mixture of open forest vegetation communities and adjoin areas of isolated rural-residential development. There exists some connectivity between the sites eastern remnant vegetation and the areas of remnant open forest to the north, via a mosaic of disturbed woodland and open forest vegetation communities and scattered trees occupying the north-eastern areas of the site. However these vegetation communities provide only limited terrestrial connectivity as they have been significantly impacted by a history of agricultural use and grazing, resulting in a sparse understorey layer.

3.1.4 Endangered Ecological Communities

Three Endangered Ecological Communities have been identified within the subject site. These are:

- Coastal Saltmarsh;
- Swamp Sclerophyll Forest on Coastal Floodplains;
- Swamp Oak Floodplain Forest.

The Coastal Saltmarsh (29 hectares) and Swamp Oak Floodplain Forest (one hectare) are located in the eastern parts of the site within the areas predominantly proposed to be retained within the Conservation Zones with proposed removal of .027ha for constriction of modification to the existing outlet drain to Myall River from the existing detention dam.

The Swamp Sclerophyll Forest on Coastal Floodplains is predominantly located within the eastern parts of the site with small areas occurring in localised depressions within the central and northern parts of the site.

Figure 3.1 shows distribution of these Endangered Ecological Communities within the subject site.

3.2 FAUNA

3.2.1 Fauna Habitats Present

A range of fauna habitats are present within the subject site reflecting the diversity in the vegetation communities present. The majority of the site is, however, of decreased habitat quality due to the large amount of disturbance through removal and modification of the groundcover and shrublayer through grazing and slashing and previous clearing of much of the site for a pine plantation.

The following fauna habitats are present on the site and on land adjacent to the site:

- Flower, nectar, fruit and seed producing tree and shrub species;
- Occasional hollow-bearing trees;
- Cleared areas;
- Pasture areas;
- Semi-aquatic habitats associated with low lying areas and intermittent ponds and drains;
- Dense understorey areas;
- Leaf litter;
- Aquatic areas associated with the Myall River foreshore and wetland areas.

The flower, nectar, seed and fruit producing tree and shrub species within the site provide a seasonal foraging resource for a range of fauna species, particularly bird and arboreal mammal species. The site contains a relatively low number of hollow-bearing trees with mostly small hollows. These hollows contain potential den, roost and breeding hollows for bird, arboreal mammal, and microchiropteran bat and reptile species.

Much of the site consists predominantly of disturbed vegetation types with a modified shrublayer and areas with groundcover dominated by pasture grasses. As such the habitat values are decreased for small terrestrial mammal, bird and reptile species. The lack of cover however does increase foraging opportunities for raptor and other bird species. The open grassed areas contain suitable habitat for macropod species, particularly the Eastern Grey Kangaroo and Red-necked Wallaby.

Areas of the subject site are prone to ponding after rain providing suitable habitat for a range of amphibian species. The drainage depressions associated with tracks and land depressions contain suitable foraging and breeding habitat for these locally occurring amphibian species.

The denser, less disturbed vegetation types associated with the Myall River wetlands provide higher quality habitat due to the increased density and diversity of the various structural layers. These less disturbed habitats provide increased foraging, refuge and breeding opportunities for mammal, bird, reptile and amphibian species. This is reflected in the species richness of these vegetation types in comparison to the majority of the site containing the disturbed vegetation communities. These higher quality vegetation and habitat types will be retained as part of the proposed development.

3.2.2 Fauna Species on Site

A list of fauna species recorded within the subject site during surveys is provided in Table 3.2.

TABLE 3.2 FAUNA SPECIES OBSERVED ON THE SITE AND ADJOINING AREAS					
Species List		**Species Locations**			
Common name	**Scientific Name**	**Riverside prior to 2007 Surveys**	**Riverside Surveys 2007/2008**	**Myall River Downs**	**Hawks Nest North**
Ampibians					
Common Eastern Froglet	*Crinia signifera*	X	X	X	X
Wallum Froglet [TS]	*Crinia tinnula*	X	X	X	X
Dainty Tree Frog	*Litoria gracilenta*	X	X	X	
Smooth Toadlet	*Uperoleia laevigata*	X	X		
Dusky Toadlet	*Uperoleia fusca*	X	X		
Dwarf Tree Frog	*Litoria fallax*	X	X	X	
Heath Frog	*Litoria jervisiensis*		X	X	
Broad-palmed Frog	*Litoria latopalmata*	X			
Rocket Frog	*Litoria nasuta*	X	X	X	
Laughing Tree Frog	*Litoria tyleri*			X	
Peron's Tree Frog	*Litoria peronii*		X	X	
Haswell's Tree Frog	*Paracrinia haswellii*	X		X	
Striped Marsh Frog	*Limnodynastes peronii*	X	X	X	
Ornate Burrowing Frog	*Limnodynastes ornatus*	X			
Spotted Marsh Frog	*Limnodynastes tasmaniensis*	X	X	X	
Red-backed Toadlet	*Pseudophryne coriacea*	X			
Bibrons Toadlet	*Pseudophryne bibronii*	X	X		
Freycinet's Frog	*Litoria freycineti*	X			
Green Tree Frog	*Litoria caerulea*			X	
Eastern Banjo Frog	*Limnodynastes dumerilii dumerilii*		X	X	
Bleating Tree Frog	*Litoria dentata*	X		X	
Whistling Tree Frog	*Litoria verreauxii*	X		X	
Reptiles					
Jacky Lizard	*Amphibolurus muricatus*	X		X	
Eastern Water Dragon	*Physignathus lesueurii*		X		
Lace Monitor	*Varanus varius*	X		X	
Striped Skink	*Ctenotus robustus*	X			
Copper-tailed Skink	*Ctenotus taeniolatus*				X
Land Mullet	*Egernia major*		X	X	
Eastern Water Skink	*Eulamprus quoyii*	X		X	
Dark-flecked Garden Sunskink	*Lampropholis delicata*	X	X	X	
Pale-flecked Garden Sunskink	*Lampropholis guichenoti*	X	X		
Weasel Skink	*Saproscincus mustelina*	X			
Eastern Blue Tongue	*Tiliqua scincoides*	X		X	
Diamond Python	*Morelia spilota*	X			
Golden-crowned Snake	*Cacophis squamulosus*	X			
Red-bellied Black Snake	*Pseudechis porphyriacus*	X	X	X	
Eastern Brown Snake	*Pseudonaja textilis*	X			
Black-bellied Swamp Snake	*Hemiaspis signata*	X			
Green Tree Snake	*Dendrelaphis punctulata*			X	
Long-necked Tortoise	*Chelodina longicollis*			X	

TABLE 3.2 (Cont.) FAUNA SPECIES OBSERVED ON THE SITE AND ADJOINING AREAS					
Species List		**Species Locations**			
Common name	**Scientific Name**	**Riverside prior to 2007 Surveys**	**Riverside Surveys 2007/2008**	**Myall River Downs**	**Hawks Nest North**
Birds					
Brown Quail	*Coturnix ypsilophora*	X		X	
Black Swan	*Cygnus atratus*	X	X	X	
Chestnut Teal	*Anas castanea*	X	X	X	
Pacific Black Duck	*Anas superciliosa*	X	X	X	X
Hardhead	*Aythya australis*			X	
Australian Wood Duck	*Chenonetta jubata*	X	X	X	
Australasian Gannet	*Morus serrator*			X	
Little Pied Cormorant	*Phalacrocorax melanoleucos*	X		X	
Little Black Cormorant	*Phalacrocorax sulcirostris*	X	X	X	
Great Cormorant	*Phalacrocorax carbo*	X		X	
Pied Cormorant	*Phalacrocorax varius*			X	
Darter	*Anhinga melanogaster*			X	
Australian Pelican	*Pelecanus conspicillatus*	X	X	X	X
Australasian Grebe	*Tachybaptus novaehollandiae*			X	
White-necked Heron	*Ardea pacifica*	X		X	
White-faced Heron	*Egretta novaehollandiae*	X	X	X	
Striated Heron	*Butorides striatus*	X			
Little Egret	*Egretta garzetta*			X	
Intermediate Egret	*Ardea intermedia*	X			
Great Egret	*Ardea alba*	X	X	X	
Cattle Egret	*Ardea ibis*	X	X	X	
Australian White Ibis	*Threskiornis molucca*	X	X	X	X
Straw-necked Ibis	*Threskiornis spinicollis*	X		X	
Royal Spoonbill	*Platalea regia*	X	X	X	
Black Bittern	*Ixobrychus flavicollis*	X			
Black-necked Stork [TS]	*Ephippiorhynchus asiaticus*			X	
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	X	X	X	X
Wedge-tailed Eagle	*Aquila audax*	X		X	
Little Eagle	*Hieraaetus morphnoides*			X	
Swamp Harrier	*Circus approximans*	X	X	X	
Whistling Kite	*Haliastur sphenurus*	X	X	X	X
Black-shouldered Kite	*Elanus axillaris*	X			
Grey Goshawk	*Accipiter novaehollandiae*			X	
Osprey [TS]	*Pandion haliaetus*	X	X	X	X
Australian Hobby	*Falco longipennis*		X		
Brown Falcon	*Falco berigora*	X		X	X
Nankeen Kestrel	*Falco cenchroides*			X	
Pied Oystercatcher [TS]	*Haematopus fuliginosus*			X	X
Sooty Oystercatcher [TS]	*Haematopus fluiginosus*			X	
Black-fronted Dotterel	*Elseyornis melanops*	X		X	
Black-winged Stilt	*Himantopus himantopus*	X			
Eastern Curlew	*Numenius madagascariensis*	X			
Whimbrel	*Numenius phaeopus*	X			
Latham's Snipe	*Gallinago hardwickii*	X			

TABLE 3.2 (Cont.) FAUNA SPECIES OBSERVED ON THE SITE AND ADJOINING AREAS					
Species List		**Species Locations**			
Common name	**Scientific Name**	**Riverside prior to 2007 Surveys**	**Riverside Surveys 2007/2008**	**Myall River Downs**	**Hawks Nest North**
Masked Lapwing	*Vanellus miles*	X	X	X	X
Silver Gull	*Larus novaehollandiae*	X		X	
Common Tern	*Sterna hirundo*	X		X	
Crested Tern	*Sterna bergii*	X			
Spotted Turtle-Dove *	*Streptopelia chinensis*	X		X	
Crested Pigeon	*Ocyphaps lophotes*	X	X	X	X
Peaceful Dove	*Geopelia striata*	X		X	
Brown Cuckoo-Dove	*Macropygia amboinensis*	X	X		
Common Bronzewing	*Phaps chalcoptera*	X		X	
Bar-shouldered Dove	*Geopelia humeralis*	X	X	X	
White-headed Pigeon	*Columba leucomela*	X	X	X	
Wonga Pigeon	*Leucosarciamelanoleuca*	X	X	X	
Emerald Dove	*Chalcophaps indica*			X	
Glossy Black-cockatoo TS	*Calyptorhynchus lathami*				X?
Sulphur-crested Cockatoo	*Cacatua galerita*	X	X	X	
Yellow-tailed Black-Cockatoo	*Calyptorhynchus funereus*	X	X	X	X
Long-billed Corella	*Cacatua tenuirostris*			X	
Galah	*Cacatua roseicapilla*	X	X	X	
Rainbow Lorikeet	*Trichoglossus haematodus*	X	X		
Scaly-breasted Lorikeet	*Trichoglossus chlorolepidotus*	X	X	X	X
Little Lorikeet	*Glossopsitta pusilla*		X		
Musk Lorikeet	*Glossopsitta porphyrocephala*	X	X	X	
Eastern Rosella	*Platycercus eximius*	X	X	X	
Channel-billed Cuckoo	*Scythrops novaehollandiae*		X	X	
Common Koel	*Eudynamys scolopacea*	X		X	
Pallid Cuckoo	*Cuculus pallidus*	X		X	
Fan-tailed Cuckoo	*Cacomantis flabelliformis*	X		X	
Pheasant Coucal	*Centropus phasianinus*	X	X	X	
Powerful Owl TS	*Ninox strenua*			X	
Barking Owl TS	*Ninox connivens*		X		
Barn Owl	*Tyto alba*			X	
Southern Boobook	*Ninox novaeseelandiae*	X	X	X	
Masked Owl	*Tyto novaehollandiae*				X
Tawny Frogmouth	*Podargus strigoides*	X	X	X	X
Fork-tailed Swift	*Apus pacificus*	X		X	
White-throated Needletail	*Hirundapus caudacutus*	X		X	
Azure Kingfisher	*Alcedo azurea*		X		
Laughing Kookaburra	*Dacelo novaeguineae*	X	X	X	X
Sacred Kingfisher	*Todiramphus sanctus*	X		X	X
Rainbow Bee-eater	*Merops ornatus*	X		X	
Dollarbird	*Eurystomus orientalis*			X	
White-throated Treecreeper	*Climacteric picumnus*	X	X	X	
Superb Fairy-wren	*Malurus cyaneus*	X	X	X	X
Variegated Fairy-wren	*Malurus lamberti*	X	X	X	

TABLE 3.2 (Cont.) FAUNA SPECIES OBSERVED ON THE SITE AND ADJOINING AREAS					
Species List		**Species Locations**			
Common name	**Scientific Name**	**Riverside prior to 2007 Surveys**	**Riverside Surveys 2007/2008**	**Myall River Downs**	**Hawks Nest North**
Southern Emu-wren	*Stipiturus malachurus*	X		X	
Spotted Pardalote	*Pardalotus punctatus*		X	X	
Striated Pardalote	*Pardalotus striatus*	X		X	
Southerrn Emu-wren	*Stipiturus malachurus*			X	
White-browed Scrubwren	*Sericornis frontalis*	X	X	X	
White-throated Gerygone	*Gerygone olivacea*	X	X	X	X
Brown Gerygone	*Gerygone mouki*	X		X	
Brown Thornbill	*Acanthiza pusilla*	X	X	X	
Buff-rumped Thornbill	*Acanthiza reguloides*	X			
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*	X		X	
Yellow Thornbill	*Acanthiza lineata*	X		X	
Stirated Thornbill	*Acanthiza chrysorrhoa*	X		X	
Red Wattlebird	*Anthochaera carunculata*	X	X	X	X
Little Wattlebird	*Anthochaera chrysoptera*	X	X	X	X
Little Friarbird	*Philemon citreogularis*				X
Noisy Friarbird	*Philemon corniculatus*	X	X	X	X
Blue-faced Honeyeater	*Entomyzon cyanotis*	X	X	X	
Noisy Miner	*Manorina melanocephala*	X	X	X	X
Lewin's Honeyeater	*Meliphaga lewinii*	X	X	X	X
Yellow-faced Honeyeater	*Lichenostomus chrysops*	X	X	X	
Brown Honeyeater	*Lichmera indistincta*			X	
Brown-headed Honeyeater	*Melithreptus brevirostris*			X	
Fuscous Honeyeater	*Lichenostomus flavescens*			X	
New Holland Honeyeater	*Phylidonyris novaehollandiae*	X		X	X
Scarlet Honeyeater	*Myzomela sanguinolenta*	X	X	X	
White-naped Honeyeater	*Melithreptus lunatus*			X	
White-cheeked Honeyeater	*Phylidonyris nigra*	X	X	X	X
Eastern Spinebill	*Acanthorhynchus tenuirostris*	X	X	X	X
Eastern Yellow Robin	*Eopsaltria australis*	X	X	X	
Eastern Whipbird	*Psophodes olivaceus*	X	X	X	X
Varied Sittella	*Daphoenositta chrysoptera*	X	X	X	
Jacky Winter	*Microeca fascinans*	X		X	
Crested Shrike-tit	*Falcunculus frontatus*			X	
Rufous Whistler	*Pachycephala rufiventris*	X	X	X	
Golden Whister	*Pachycephala pectoralis*	X	X	X	
Grey Shirke-thrush	*Colluricincla harmonica*	X		X	
Mistletoebird	*Dicaeum hirundinaceum*	X		X	
Grey Fantail	*Rhipidura fuliginosa*	X	X	X	
Rufous Fantail	*Rhipidura rufifrons*		X		
Leaden Flycatcher	*Myiagra rubecula*	X	X	X	
Willie Wagtail	*Rhipidura leucophrys*	X	X	X	X
Magpie-lark	*Grallina cyanoleuca*	X	X	X	X
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*	X	X	X	X
White-winged Triller	*Lalage sueurii*			X	
Olive-backed Oriole	*Oriolus sagittatus*		X	X	
Figbird	*Sphecotheres viridis*			X	

TABLE 3.2 (Cont.) FAUNA SPECIES OBSERVED ON THE SITE AND ADJOINING AREAS					
Species List		**Species Locations**			
Common name	**Scientific Name**	**Riverside prior to 2007 Surveys**	**Riverside Surveys 2007/2008**	**Myall River Downs**	**Hawks Nest North**
White-breasted Woodswallow	*Artamus leucorynchus*		X	X	
Dusky Woodswallow	*Artamus cyanopterus*	X	X	X	
White-winged Chough	*Corcorax melanorhamphos*	X	X	X	
Satin Bowerbird	*Ptilonorhynchus violaceus*	X		X	
Richards Pipit	*Anthus novaeseelandiae*			X	
Grey Butcherbird	*Cracticus torquatus*	X	X	X	
Pied Butcherbird	*Cracticus nigrogularis*	X	X	X	X
Australian Magpie	*Gymnorhina tibicen*	X	X	X	X
Spangled Drongo	*Dicrurus bracteatus*			X	
Pied Currawong	*Strepera graculina*	X	X	X	X
Torresian Crow	*Corvus orru*	X	X	X	X
Australian Raven	*Corvus coronoides*	X	X	X	X
Red-browed Finch	*Neochmia temporalis*	X	X	X	
Double-barred Finch	*Taeniopygia bichenovii*	X			
Golden-headed Cisticola	*Cisticola exilis*	X		X	
Little Grassbird	*Megalurus gramineus*	X			
Welcome Swallow	*Hirundo neoxena*	X	X	X	X
Fairy Martin	*Hirundo ariel*	X			
Silvereye	*Zosterops lateralis*	X	X	X	X
House Sparrow *	*Passer domesticus*	X		X	
Common Starling *	*Sturnus vulgaris*	X			
Common Myna *	*Acridotheres tristis*	X		X	
Mammals					
Echidna	*Tahyglossus aculeatus*	X			
Eastern Grey Kangaroo	*Macropus giganteus*	X	X	X	
Red-necked Wallaby	*Macropus rufogriseus*	X	X	X	
Swamp Wallaby	*Macropus bicolor*	X		X	
Northern Brown Bandicoot	*Isoodon macrourus*	X		X	
Long-nosed Bandicoot	*Parameles nasuta*	X			
Common Brushtail Possum	*Trichosurus vulpecula*	X	X	X	X
Common Ringtail Possum	*Pseudocheirus peregrinus*	X		X	
Koala [TS]	*Phascolartos cinereus*	X		X	X
Squirrel Glider [TS]	*Petaurus norfolcensis*	X		X	
Sugar Glider	*Petaurus breviceps*	X		X	
Feathertail Glider	*Acrobates pygmaeus*	X		X	
Eastern Pygmy-possum [TS]	*Cercartetus nanus*			X	
Yellow-footed Antechinus	*Antechinus flavipes*				X
Brown Antechinus	*Antechinus stuartii*	X	X	X	X
Common Dunnart	*Sminthopsis murina*	X			
Grassland Melomys	*Melomys burtoni*			X	
Grey-headed Flying-fox [TS]	*Pteropus poliocephalus*	X	X	X	
Little Red Flying-fox	*Pteropus scapulatus*		X		
Common Blossom-bat [TS]	*Syconycteris australis*	X			X
Gould's Wattled Bat	*Chalinolobus gouldii*	X	X	X	

TABLE 3.2 (Cont.) FAUNA SPECIES OBSERVED ON THE SITE AND ADJOINING AREAS					
Species List		**Species Locations**			
Common name	**Scientific Name**	**Riverside prior to 2007 Surveys**	**Riverside Surveys 2007/2008**	**Myall River Downs**	**Hawks Nest North**
Chocolate Wattled Bat	*Chalinolobus morio*	X	X	X	
Eastern Freetail-bat [TS]	*Mormopterus norfolkensis*	X		X	
Freetail-bat	*Mormopterus species 2.*			X	
Eastern Bentwing-bat [TS]	*Miniopterus schreibersii oceanensis*	X			
Little Bentwing-bat [TS]	*Miniopterus australis*	X	X	X	
Large-footed Myotis [TS]	*Myotis adversus*	X			
Gould's Long-eared Bat	*Nyctophilus gouldii*			X	
Lesser Long-eared Bat	*Nyctophilus geoffroyi*	X		X	
Long-eared Bat	*Nyctophilus sp.*		X	X	
White-striped Freetail-bat	*Nyctinomus australis*			X	
Greater Broad-nosed Bat [TS]	*Scoteanax rueppelli*	X		X	X
Eastern Broad-nosed Bat	*Scotorepens orion*			X	
Large Forest Bat	*Vespadelus darlingtoni*	X			
Little Forest Bat	*Vespadelus vulturnus*	X	X	X	
Eastern Forest Bat	*Vespadelus pumilus*	X	X		
Southern Forest Bat	*Vespadelus regulus*	X		X	
Bush Rat	*Rattus fuscipes*	X	X	X	X
Swamp Rat	*Rattus lutreolus*	X		X	
Black Rat *	*Rattus rattus*	X			
House Mouse *	*Mus musculus*	X		X	
New Holland Mouse	*Pseudomys novaehollandiae*				X
Eastern Chestnut Mouse [TS]	*Pseudomys gracilicaudatus*			X	
Dog *	*Canis familiaris*	X		X	
Dingo	*Canis lupus*	X			X
European Red Fox *	*Vulpes vulpes*	X		X	
Cat *	*Felis cattus*	X		X	X
Rabbit *	*Oryctolagus cuniculus*	X	X	X	
Brown Hare *	*Lepus lepus*	X	X	X	
Horse *	*Equus caballus*		X		
Goat *	*Capra hircus*	X			
Cow *	*Bos taurus*	X	X	X	
Fish					
Plague Minnow *	*Gambusia holbrooki*	X	X	X	
Crustean					
Blue-claw Crayfish	*Cherax destructor*	X	X	X	
[TS] Threatened species	* Introduced species		X? unconfirmed record		

Birds

A total of 78 bird species were recorded within the subject site during the surveys conducted in 2007/2008. A full list of bird species recorded within the local area is provided in Table 3.2.

Two threatened bird species, the Barking Owl and Osprey, as listed in Schedule 2 (vulnerable) of the *TSC Act* (1995), were recorded within the subject site during surveys conducted in 2007/2008.

Diurnal Birds

A total of 75 diurnal bird species were recorded within the subject site during surveys conducted in 2007/2008.

Of these, 16 species are considered to be dependant on aquatic habitats for foraging. Some water bird species, such as ducks, herons, egrets, spoonbills and the ibis, occur in greater numbers in coastal regions during high rainfall periods especially when inland areas are in drought. However, within the local area, these species appear to be resident for most of the year, regardless of rainfall, due to the presence of permanent water bodies associated with the Myall River estuary.

Six diurnal raptor species were recorded within the subject site during the surveys conducted 2007/2008. One threatened raptor species, the Osprey, as listed in Schedule 2 (vulnerable) of the *TSC Act* (1995), was recorded flying over the subject site.

Nocturnal Birds

A total of 3 nocturnal species were recorded within the subject site during surveys conducted in 2007/2008 of which one species the Barking Owl *(Ninox connivens)* is listed on Schedule 2 (vulnerable) of the TSC Act 1995. A further 4 nocturnal bird species have been recorded within 10km of the subject site including the Powerful Owl *(Ninox strenua)* and the Masked Owl *(Tyto novaehollandiae)* both listed in Schedule 2 (vulnerable) of the TSC Act 1995 (NPWS 2008).

Mammals

A total of 9 mammal species (excluding bats) were recorded within the subject site during the surveys conducted in 2007/2008. One of these species (Squirrel Glider) is listed in Schedule 2 (vulnerable) of the *TSC Act* (1995).

Five exotic mammal species were recorded within the subject site during surveys conducted in 2007/2008, of which 3 are considered pest species.

Two species the Eastern Pygmy-possum and Eastern Chestnut Mouse, as listed in Schedule 2 (vulnerable) of the *TSC Act* (1995) have been recorded within 5 kilometres of the site.

Arboreal Mammals

Suitable foraging and shelter habitat for arboreal mammals was observed within the subject site. One arboreal mammal species was recorded during the surveys conducted in 2007/2008. A full list of arboreal mammal species recorded within the local area is provided in Table 3.2.

Terrestrial Mammals

Suitable habitat for terrestrial mammals was observed within the subject site. *Macropod* species were common within the cleared areas, and smaller *Rattus* species in the forested areas. A total of 8 terrestrial mammal species were recorded within the subject site during surveys conducted in 2007/2008.

A full list of terrestrial mammal species recorded within the local area is provided in Table 3.2.

Bats

Suitable foraging habitat megachiropteran and microchiroptera bats are present within the subject site. Suitable roosting habitat is present only for those species that roost in tree hollows or under bark.

A total of 8 bat species were recorded within the subject site during surveys conducted in 2007/2008. The following threatened bat species as listed within the *TSC Act* (1995) were identified on the site:

- Grey-headed Flying-fox;
- Little Bentwing-bat;
- Eastern Freetail-bat;
- Greater Broad-nosed Bat.

Frogs

A total of 13 frog species were observed within the subject site during surveys conducted in 2007/2208, including 1 threatened species, the Wallum Froglet, as listed in Schedule 2 (vulnerable) of the *TSC Act* (1995). All other observed species are considered relatively common in the local area.

Targeted Wallum Froglet surveys were carried out to determine its distribution within the subject site. This species was heard calling during both diurnal and nocturnal surveys, and on most visits to the site.

The Plague Minnow (*Gambusia hoolbrooki*), which predates on tadpoles, is abundant in all permanent fresh water bodies across the subject site. Tadpole predation by Plague Minnow is a listed Threatening Process within Schedule 3 of the *TSC Act* (1995).

A full list of frog species recorded within the local area is provided within the Table 3.2.

A total of 20 frog species have been recorded within 10km of the subject site (NPWS 2008).

Reptiles

A total of 5 reptile species were observed within the subject site during surveys conducted in 2007/2008. No threatened reptile species were recorded.

The subject site contains suitable reptile habitat in the form of wet areas, fallen logs and hollow bearing trees within forested areas. Drainage lines provide suitable foraging and shelter habitat for skinks, dragons, pythons and elapid snake species such as the Black-bellied Swamp Snake and the Red-bellied Black Snake.

A full list of reptile species recorded within the local area is provided within the Appendices.

Aquatic Species

Two aquatic species were recorded during the fauna surveys within the subject site. These species are Plague Minnow and the Blue-claw Crayfish.

3.2.3 Threatened Fauna Species

The detailed seasonal surveys undertaken during 2007/08 identified the following threatened fauna species within the subject site.

- Wallum Froglet (*Crinia tinnula*);
- Osprey (*Pandion haliaetus*);
- Barking Owl (*Ninox connivens*);
- Little Bentwing-bat (*Miniopterus australis*);
- Grey-headed Flying-fox (*Pteropus poliocephalus).*

Additionally the following species have previously been recorded on the subject site.

- Squirrel Glider (*Petaurus australis*).
- Koala (*Phascolarctos cinereus*);
- Common Blossom-bat (*Syconycteris australis*).
- Eastern Freetail-bat (*Mormopterus norfolkensis*);
- Greater Broad-nosed Bat (*Scoteanax rueppellii*);
- Eastern Bentwing-bat (*Minipterus schreibersii oceanensis*).

Figure 3.2 shows the location of threatened species observed within the subject site during recent surveys undertaken during 2007 and 2008.
The detailed surveys completed for the subject site have identified several threatened fauna species utilising habitats present for foraging purposes. Details of these species and other threatened fauna species with suitable habitat present are provided below.

Wallum Froglet (*Crinia tinnula)*
This species is usually found in association with wetlands and vegetation communities occurring on low nutrient sandy soils, including coastal freshwater swamps and lakes, wet heath and nearby eucalypt/forest woodland. Water bodies this species breeds in are usually nutrient poor and acidic wallum areas (pH<6.0).

This species was observed calling within a number of areas of the subject site during surveys. The higher quality, less disturbed vegetation and habitat types for this species within the subject site will be retained by the proposed development. The Management Plan to be implemented for the site will detail strategies for the control of water quality and maintenance of hydrological conditions.

Green and Golden Bell Frog (*Litoria aurea*)
The Green and Golden Bell Frog is largely aquatic and is found among vegetation within or at the edges of permanent water. It is frequently active during the day and can be found under debris on low, frequently flooded river flats.

The subject site contains some suitable habitat for this species within the wetter vegetation types associated with the farm dams. This species was not detected within the subject site during surveys.

Green-thighed Frog (*Litoria brevipalmata*)
The Green-thighed Frog has been found in mostly terrestrial habitats including along the grassy margins of semi-permanent and permanent ponds in late spring and rainforests, moist open forest (Robinson 1993), drier open forest and woodland (Nattrass & Ingram 1993), coastal swamp forest and along the perimeter of flooded paddocks (Barker & Grigg 1977).

The subject site contains some suitable habitat for this species within the wetter vegetation types associated with the farm dams.

Magpie Goose (*Anseranas semipalmata*)
Magpie Geese inhabit terrestrial wetlands live in shallow swamps and associated grasslands, feeding on seeds or tubers and green grass. They occur across northern Australia and throughout eastern Australia including parts of western NSW (Garnett & Crowley 2000).

The subject contains suitable foraging habitat for this species. This species was not observed within the subject site during surveys.

Osprey (*Pandion haliaetus*)
The Osprey is generally found in association with waterbodies including coastal waters, inlets, lakes, estuaries, beaches, off shore islands and sometimes along inland rivers (Schodde and Tidemann 1986; Clancy 1991; Olsen 1995). These habitat locations usually have a sufficient supply of fish for food and possible nesting sites (Clancy 1991). Osprey may nest on the ground on sea cliffs or in trees (Olsen 1995). Ospreys generally prefer emergent trees, often dead or partly dead with a broken off crown (Olsen 1995). Nests are large and built of sticks, roughly lined with grass and seaweed (Schodde and Tidemann 1986).

The subject site contains suitable roosting habitat for this species adjacent to suitable foraging areas within the Myall River. This species was detected flying over the site but was not detected roosting within the subject site during surveys. This species has previously been recorded utilising a nest site within the Tea Gardens township.

Bush Stone-curlew (*Burhinus grallarius*)
The Bush Stone-curlew has been located in dry open woodland closely associated with grassy areas, occasionally near beaches. It prefers to forage in areas with fallen timber, leaf litter, and little undergrowth and where the grass is short and patchy (Environment Australia 2000). Marchant and Higgins 1993; Johnson and Baker-Gabb 1994). It is occasionally recorded on dune scrubs, in savanna areas, the fringes of mangroves and even on golf courses and open forest farmland (Marchant and Higgins 1993). The Bush Stone-curlew roosts on ground among leaf-litter, often among clumps or thickets of trees in, or adjacent to, more open habitat; within day-shelters, percentage cover of fallen tree debris is higher; there is more bare ground, lower grass and less disturbance (Environment Australia 2000).

The subject site contains some suitable habitat for this species. This species was not detected within the subject site during surveys.

Black-necked Stork (*Ephipiorhynchus asiaticus*)
The Black-necked Stork occurs throughout tropical and warm temperate terrestrial wetlands, estuarine and littoral habitats and occasionally in grassland and wooded lands (Marchant and Higgans 1990). This species utilises a range of waterbodies including extensive sheets of shallow water over grassland and sedgeland, shallow swamps with small emergent vegetation and abundant aquatic life, permanent billabongs and pools on floodplains, freshwater meadows, wet heathland, seepage fern springs, semi-permanent swamps with tall emergent vegetation and occasionally in small artificial waterbodies such as farm dams, irrigation storages and sewage ponds (Marchant and Higgans 1990).

The subject contains suitable foraging habitat for this species. This species was not observed within the subject site during surveys. There is a local recent record for this species to the south-west of the subject site (*Conacher Travers* 2006) at Myall River Downs.

Square-tailed Kite (*Lophoictinia isura*)
The Square-tailed Kite occurs typically in forested and wooded lands of tropical and temperate Australia (Marchant and Higgins 1993). The species may be recorded inland along timbered watercourses, but are often absent from waterless areas (NPWS 1999).

The subject site contains suitable roosting habitat for this species adjacent to suitable foraging areas. This species was not detected within the subject site during surveys.

Glossy Black-Cockatoo (*Calyptorhynchus lathami*)
The Glossy Black-Cockatoo inhabits mountain forests, coastal woodland, open forest and trees bordering watercourses where there are substantial stands of casuarinas. Foraging within Casuarinas tends to be concentrated on trees with greater crops of cones (Clout 1989). This species nests in large trees with large hollows (dead and alive). The Glossy Black-Cockatoo usually forages close to the nest but is capable of traveling up to 20km away thus requiring a water source (DEH 2000).

The subject contains suitable foraging habitat for this species within the Allocasuarina tree species present. This species was not observed within the subject site during surveys.

Swift Parrot *(Polytelis swainsonii)*
This species feeds mainly on nectar and lerp from eucalypt flowers, particularly Blue Gum (*Eucalyptus globulus*). On the mainland, the Swift Parrot congregates where winter flowering species such as Red Ironbark (*Eucalyptus sideroxylon*), White Box (*Eucalyptus albens*), Yellow Gum (*Eucalyptus leucoxylon*) and Swamp Gum (*Eucalyptus ovata*) (Brown, 1989). The Swift Parrot is a migratory species that breeds in Tasmania and its offshore islands in summer (Shepherd, 1994). In late March almost the entire population migrates to mainland Australia (Schodde and Tidemann, 1986).

The subject site contains some suitable foraging habitat for this species within the winter flowering *Eucalyptus robusta* however it was not detected during surveys.

Turquoise Parrot (*Neophema pulchella*)
The Turquoise Parrot is a sedentary species inhabiting the foothills of the Great Divide, including steep rocky ridges and gullies, rolling hills, valleys and river-flats, sometimes nearby plains. This species feeds on the ground among seeding grasses or weeds usually beneath trees. Endemic to eastern Australia, from south east Queensland through eastern New South Wales to north east Victoria (Higgins 1999).

The subject site contains some suitable foraging habitat for this species however it was not detected during surveys.

Powerful Owl (*Ninox strenua*)
The Powerful Owl inhabits mature rainforest and wet and dry eucalypt forest (Schodde and Tidemann 1986). Large trees with hollows at least 0.5m deep are required for shelter and breeding (Schodde et al. 1980; SWC Consultancy 1993). Estimates of the home range of this species vary greatly but territories are thought to be a minimum of 800 hectares (Kavanagh 1988). It is suggested that Powerful Owls forage by concentrating their activities in pockets of their large home range until they reduce their population of preferred prey below limits where it becomes difficult to catch the remaining animals (Kavanagh, 1988).

This species has been recorded within the local area (*PPK* 2000, *Conacher Travers* 2006). However, despite extensive surveys, this species has not been recorded within the subject site. The subject site contains suitable foraging habitat for this species. No hollows of a suitable size for roosting or breeding have been identified within the subject site.

Barking Owl *(Ninox connivens)*
The Barking Owl utilises dry sclerophyll forests and woodlands of tropical, temperate and semi-arid zones, often dominated by eucalypts, and containing many large trees suitable for roosting or breeding. This species is both carnivorous and insectivorous, taking mainly insects outside breeding season and more birds and mammals when breeding (Higgins, 1999).

The subject site contains suitable foraging habitat for this species. No hollows of a suitable size for roosting or breeding have been identified within the subject site. This species was recorded within the subject site during surveys.

Masked Owl (*Tyto novaehollandiae*)
The Masked Owl is widespread though forests and woodlands, utilising caves for shelter in treeless country. The Masked Owl is known to utilise forest margins and isolated stands of trees within agricultural land (Hollands 1991; Hyem 1979). This species is often found in heavily disturbed forest where its prey of small and medium sized mammals can be readily obtained (Kavanagh and Peake 1993). The Masked Owl requires old mature trees with large hollows for breeding and as diurnal roosting sites, being dependent upon hollow bearing trees all year round rather than only during the breeding season (Hyem, 1979).

This species has been recorded within the local area (*ERM Mitchell McCotter* 1998, *Conacher Travers* 2006). However, despite extensive surveys, this species has not been recorded within the subject site. The subject site contains suitable foraging habitat for this species. No hollows of a suitable size for roosting or breeding have been identified within the subject site.

Regent Honeyeater (*Xanthomyza phrygia*)
The Regent Honeyeater inhabits temperate eucalypt woodland and open forest including forest edges, wooded farmland and urban areas with mature eucalypts. This species is also known to utilise riparian forests of River Oak (*Casuarina cunnighamiana*) (Garnett 1993). The Regent Honeyeater relies on locally abundant nectar sources, especially flowering eucalypts that occur mainly in dry open woodland.

The subject site contains some suitable foraging habitat for this species within the winter flowering *Eucalyptus robusta* however it was not detected during surveys.

Black-chinned Honeyeater *(Melithreptis gularis gularis*)
The Brown Treecreeper can be found in eucalypt woodland over much of eastern Australia. They prefer drier forests/woodlands with fallen branches and its distribution is known to coincide with that of River Red Gums and other eucalypts bordering river courses but it prefers rough-barked trees, especially the boxes and peppermints (Longmore, 1991; Pizzey and Knight, 1997). Hollows in trees are known to be important for Brown Treecreepers. They provide nesting chambers, roosting sites, refuges from predators and sources of food (Longmore, 1991).

The subject site contains some suitable foraging habitat for this species however it was not detected during surveys.

Koala (*Phascolarctos cinereus)*
Koalas inhabit forested areas with acceptable Eucalypt food trees, also utilising non-Eucalypt species as a food source. Koalas inhabit both wet and dry Eucalypt forest that contains a canopy cover of approximately 10 to 70% (Reed *et al.* 1991) growing on high nutrient soils.

The subject site contains some suitable foraging and refuge/shelter habitat for this species within tree species present however it was not detected during surveys. The most recent record for this species within the subject site is from 1995 (NPWS 2008).

Squirrel Glider *(Petaurus norfolcensis)*
The Squirrel Glider is an arboreal, tree dwelling mammal that feeds on nectar, pollen, eucalypt sap, *Acacia* gum, honeydew and arthropods (Quin 1993). The Squirrel Glider feeds on sugary exudates to obtain its energy requirements and arthropods for protein (Smith 2002). The Squirrel Glider feeds on nectar of flowering tree species, honeydew and by gleaning arthropods from vegetation. This species also feeds on sap flows by incising the bark of trees. The Squirrel Glider uses tree hollows for den sites either alone or communally.

The subject site contains suitable foraging and den/refuge habitat for this species. This species was observed within the subject site during surveys in 2002 and 2004.

Eastern Pygmy-possum (*Cercatetus nanus*)
The Eastern Pygmy-possum is found from rainforest through sclerophyll forest to tree heath. Banksia and myrtaceous shrubs and trees are favoured (Turner and Ward, 1995). An important determinant of habitat quality may be the proportion of the year in which pollen is available and the species is usually associated with floristically diverse shrub community, especially those including *Banksia* species. However populations also occur in box-ironbark associations where the understorey is sparse but relatively diverse (Menkhorst, 1996).This species has a preference for hollows with a small entrance (Environment Australia, 1999).

The subject site contains suitable foraging and den/refuge habitat for this species. This species was not observed within the subject site during surveys. The Eastern Pygmy-possum is known from two recent locations within the Tea Gardens area (*Conacher Travers* 2006; M. Bell *pers. comm*. 2006).

Brush-tailed Phascogale (*Phascogale tapoatafa*)
The principle habitat of the Brush-tailed Phascogale are dry open forest and woodlands containing various associations of bloodwood, messmate, box, stringybark and ironbark trees (Cuttle 1982, 1992; Traill 1991; Traill and Coates 1993) with an understorey varying between acacias, grasses and low herbs and dense leaf litter (Cuttle 1982). Tree hollows are used for shelter and nesting which can be shared by several individuals.

The subject site contains some suitable habitat for this species however it was not detected during surveys.

Common Planigale (*Planigale maculata*)
The Common Planigale has been detected in habitats ranging from rainforest to dry hardwood forest, grasslands, marshlands, rocky areas and on the fringes of urban areas (Braithwaite 1988).

The subject site contains some suitable habitat for this species however it was not detected during surveys.

Long-nosed Potoroo (*Potorous tridactylus*)
The Long-nosed Potoroo occupies a wide range of habitats, from heath to dry and moist hardwood forests usually where rainfall exceeds 760mm. It requires thick groundcover and may be commoner on light sandy soils (Newsome and Catling, 1979). Schlager (1981) proposed that warm, temperate rainforest provides the 'backbone' of the distribution of this species with surrounding moist hardwood forests as the supplementary habitat.

The subject site contains some suitable habitat for this species however it was not detected during surveys.

Eastern Chestnut Mouse (*Pseudomys gracilicaudatus*)
The Eastern Chestnut Mouse has been recorded in open woodlands with a grassy understorey but is more often found in heathland and most common in dense wet heath swampy areas (Fox 1988). Nests are constructed from grass and are located either above ground or in a tunnel system (Fox1988). Optimal habitat for this species is provided by regenerating vegetation (Fox 1988). Disturbance by wildfire appears to favour an increase in populations (Fox 1988, 1990; Fox et al. 1985) with substantial increases having been reported in coastal heathland in the second to fourth regeneration years after fire (Fox 1990).

The subject site contains suitable habitat for this species. This species was not observed within the subject site during surveys. The Eastern Chestnut Mouse is known from one recent location within the Tea Gardens area (PPK 2000).

Grey-headed Flying-fox (*Pteropus poliocephalus*)
The Grey-headed Flying-fox is found in a variety of habitats including rainforest, mangroves, paperbark swamps, wet and dry sclerophyll forests and cultivated areas (Churchill, 1998). Grey-headed Flying-foxes congregate in large camps of up to 200,000 individuals, depending on availability of surrounding blossoming plants, from early until late summer (Churchill, 1998). Camps are commonly formed in gullies, typically not far from water and in vegetation with a dense canopy. Roost sites are and important resource where mating, birth and rearing of young occurs as well as providing refuge (Strahan, 1995).

The subject site provides suitable foraging habitat for this species, however no colonies or camp sites were located on the subject site during surveys. The Grey-headed Flying-fox has been detected within the subject site on several occasions.

Common Blossom-bat (*Synconycteris australis*)
The Common Blossom-bat is found in the coastal regions from Cape York Peninsula to Northern NSW. In tropical Australia, the Common Blossom-bat roosts among rainforest foliage and feeds on nectar and pollen from a variety of rainforest trees. (Law & Spencer 1995). At the southern limits of its range, heathland and Melaleuca swamps are critical feeding habitats: *Banksia, Melaleuca, Callistemon* and certain eucalypts are favoured sources of food in these areas (Law & Spencer 1995).

Large-eared Pied Bat (*Chalinolobus dwyeri*)
The Large-eared Pied Bat forages for insects below the forest canopy. During the day these bats may roost in caves, mine tunnels and the abandoned nests of Fairy Martins (Dwyer, 1991). The Large-eared Pied Bat may also utilise tree hollows (Schultz *et. al.* 1994). The Large-eared Pied Bat is mainly found in drier habitat including dry sclerophyll and woodland, east and west of the Great Dividing Ranges. However Hoye and Dwyer (1995) suggest that from records of the species in subalpine woodland, moist eucalypt forest and near rainforest, it may tolerate a greater range of habitats. The distribution of this bat ranges from inland and south-eastern Queensland to central-eastern and north-eastern NSW (Parnaby 1992).

The subject site contains suitable foraging and roosting habitat for this species however it was not detected during surveys.

Large-footed Myotis (*Myotis adversus*)
The Large-footed Myotis inhabits cool temperate, temperate, sub tropical and tropical rainforests and wet and dry sclerophyll forests (Richards 1995b). This species roost in colonies in caves, mines, tunnels, under bridges and buildings, in dense foliage in tropical areas (Richards 1995b) and in tree hollows (Menkhorst 1995). Colonies are always found near water bodies as the species feeds predominantly over water.

Little Bentwing-bat (*Miniopterus australis*)
The Little Bentwing-bat is generally found in forested areas where it forages below the tree canopy (Dwyer 1995). This species roosts in caves, old mines, stormwater channels, tree hollows, buildings and in bunches of bananas, using different roosting sites depending on seasonal needs, age and reproductive status (Dwyer 1995, Hulm 1994).

The subject site contains suitable foraging and roosting habitat for this species. The Little Bentwing-bat was observed within the subject site during recent surveys.

Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*)
The Eastern Bentwing-bat forages above and below the canopy within open forests and woodlands, feeding on small insects (Dwyer 1995a). The Esatern Bentwing-Bat is known to roost in a range of habitats including stormwater channels, under bridges, occasionally in buildings, old mines and, in particular, caves (Dwyer 1995a).

The subject site contains suitable foraging habitat for this species. The Eastern Bentwing-bat was observed within the subject site during surveys conducted by *Ecotone Ecological Consultants* in 1995 and *Conacher Travers* in 2001, 2002 and 2004.

Greater Broad-nosed Bat (*Scoteanax rueppellii*)
The Greater Broad-nosed Bat inhabits open forests and woodlands, foraging throughout these forest types and also along creeks and small river systems (Hoye & Richards, 1995). This species roosts in tree hollows and occasionally old buildings (Hoye & Richards, 1995).

The subject site contains suitable foraging and roosting habitat for this species. The Greater Broad-nosed Bat was observed within the subject site during surveys conducted by *Ecotone Ecological Consultants* in 1995 and *Conacher Travers* in 2002.

Eastern Freetail-bat (*Mormopterus norfolkensis*)
The Eastern Freetail-bat feeds on insects, flying above the canopy or in clearings along the edge of the forest (Allison, 1988). The Eastern Freetail-bat is generally found in rainforests, open forests and woodland (*AMBS* 1995). Colonies have been found roosting under loose bark, in tree hollows (Allison 1988), within the roofs of houses and in other modified habitats.

The subject site contains suitable foraging and roosting habitat for this species. The Eastern Freetail-bat has been observed during surveys conducted within the subject site by Conacher Travers in 2004.

Eastern False Pipistrelle (*Falsistrellus tasmaniensis*)
The Eastern False Pipistrelle inhabits warm to cool temperate moist and dry open forests (Strahan 1988). Little is known about the biology of this species although it has been recorded in logged and unlogged areas, preferring open areas for foraging (O'Neill &Taylor 1986). The Eastern False Pipistrelle roosts mainly in tree hollows, occasionally utilising caves and abandoned buildings (Parnaby 1992, Phillips *et al.* 1985).

The subject site contains suitable foraging and roosting habitat for this species however it was not detected during surveys.

Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*)
The Yellow-bellied Sheathtail Bat inhabits open country, mallee, eucalypt forests, rainforests, heathland and waterbodies. It roosts in tree hollows and has been found inhabiting the abandoned nests of Sugar Gliders (Richards 1988).

The subject site contains suitable foraging and roosting habitat for this species however it was not detected during surveys.

3.2.4 Fish Species

A total of 15 fish species have been identified within the Riverside Lake since fish surveys were commenced in 1998. The latest survey by AMBS and Harris Research Pty Ltd (2007) identified 11 species occurring within the lake. The fish species observed in the lake are listed in Table 3.3.

TABLE 3.3
FISH SPECIES OBERVED WITHIN THE LAKE

Gambusia holbrooki	Eastern gambusia
Psuedomugil signifier	Pacific blue-eye
Mugil cephalus	Striped (or 'sea') mullet
Myxus elongates	Sand mullet
Acanthopagrus australis	Yellow-finned Bream
Gerres subfasciatus	Silver Biddy
Philypnodon grandiceps	Flathead gudgeon
Philypnodon sp.	Dwarf flathead gudgeon
Afurcagobius tamarensis	Blue spot goby
Amoya bifrenatus	Tamar River goby
Favonigobius exquisitus	Exquisite sand goby
Galaxias maculatus	Common jollytail
Gobiopterus semivestitus	Glass goby
Mugilogobius paludis	Mangrove goby

Annexure 1 – 2008 Flora Survey Data

Family	Scienfic Name	Common Name	Q1	T1	Q2	T2	Q3	T3	Q4	T4	Q5	T5	Q6	T6	Q7	T7	Q8	T8	Q9	T9	Q10	T10	Q11	T11	Form	Status	Caps
Anthericaceae	*Caesia parviflora var. parviflora*	-	1	x																					g	u	7183
Anthericaceae	*Thysanotus tuberosus*	Common Fringe-lily																							g	u	3574
Anthericaceae	*Tricoryne elatior*	lily																							g	u	7355
Apiaceae	*Centella asiatica*	Pennywort		x													1	x			2	x			g	u	1106
Apiaceae	*Hydrocotyle bonariensis**	A Pennywort			1	x								x											g	u	1123
Apiaceae	*Hydrocotyle peduncularis*	-	1	x	2	x	2	x	2	x			2	x			2	x	1	x					g	u	1130
Apiaceae	*Platysace ericoides*	-																							g	u	1143
Apiaceae	*Platysace lanceolata*	Native Parsnip																					2	x	s	u	1144
Apiaceae	*Platysace linearifolia*	Narrow-leafed Platysace																							s	u	1145
Apocynaceae	*Gomphocarpus fruticosus**	Narrow-leaved Cotton Bush												x											s	u	1227
Apocynaceae	*Parsonsia straminea*	Common Silkpod																							v	u	1185
Araliaceae	*Polyscias sambucifolia subsp.sambucifolia*	-						x		x	1														s	u	12373
Arecaceae	*Livistona australis*	Cabbage Palm	1				1		1																t	P13	1221
Asparagaceae	*Asparagus aethiopicus**	Asparagus Fern							1																g	u	11784
Asteraceae	*Bidens pilosa**	Cobbler's Pegs	1	x	4	x	1	x	1	x	2	x	1	x	2	x									g	u	1283
Asteraceae	*monilifera subsp. rotundata*	Bitou Bush		x																			1		s	u	8686
Asteraceae	*Cirsium vulgare**	Spear Thistle											2	x	1	x									g	u	1400
Asteraceae	*Conyza bonariensis**	Flaxleaf Fleabane	1	x	2	x			1	x	2	x	1	x	1	x									g	u	1404
Asteraceae	*Conyza sumatrensis**	Tall fleabane			1	x					1	x	2	x	2	x									g	u	10442
Asteraceae	*Crassocephalum crepidioides**	Thickhead			1	x	1	x					1												g	u	1421
Asteraceae	*Epaltes australis*	Spreading Nut-heads															1	x							g	u	7425
Asteraceae	*Hypochaeris radicata**	Catsear	2	x	2	x			2	x	2	x			1	x	1	x	1	x					g	u	8788
Asteraceae	*Lagenifera stipitata*	Blue Bottle-daisy	1	x													1	x							g	u	1551
Asteraceae	*Senecio diaschides*	-	1	x																					g	u	7914
Asteraceae	*Senecio madagascariensis**	Fireweed	1	x		x						x	1	x	2	x	1	x					1	x	g	u	6465
Asteraceae	*Sigesbeckia orientalis subsp. orientalis*	Indian Weed																							g	u	8789

Family	Scienfic Name	Common Name	Q1	T1	Q2	T2	Q3	T3	Q4	T4	Q5	T5	Q6	T6	Q7	T7	Q8	T8	Q9	T9	Q10	T10	Q11	T11	Form	Status	Caps
Asteraceae	*Taraxacum officinale**	Dandelion							2	x			2	x	1	x							1	x	g	u	1698
Asteraceae	*Vernonia cinerea var. cinerea*	-		x	1	x															1	x			g	u	9254
Baueraceae	*Bauera rubioides*	Dog Rose																							g	u	2268
Bignoniaceae	*Pandorea pandorana*	Wonga Wonga Vine					1	x	1	x															g	u	1740
Blechnaceae	*Blechnum indicum*	Swamp Water Fern											1	x											g	u	8057
Blechnaceae	*Doodia aspera*	Prickly Rasp Fern																							f	u	8064
Cactaceae	*Opuntia stricta var. stricta**	Common Prickly Pear																							s	u	7659
Campanulaceae	*Wahlenbergia gracilis*	Australian Bluebell			1	x				x				x											g	u	1934
Caryophyllaceae	*Stellaria media**	Common Chickweed	1	x											1										g	u	2006
Casuarinaceae	*Allocasuarina littoralis*	Black Sheoak																							t	u	2012
Clusiaceae	*Hypericum gramineum*	Small St John's Wort																	1	x					g	u	7240
Clusiaceae	*Hypericum japonicum*	-																							g	u	2203
Commelinaceae	*Commelina cyanea*	Native Wandering Jew	2	x	1	x	2	x	1	x				x											g	u	2209
Convolvulaceae	*Dichondra repens*	Kidney Weed		x													2	x							g	u	2222
Convolvulaceae	*Polymeria calycina*	Polymeria															1	x							g	u	2231
Cyperaceae	*Baumea articulata*	Jointed Twig-rush																							g	u	2296
Cyperaceae	*Baumea rubiginosa*	-																			1	x			g	u	2302
Cyperaceae	*Baumea teretifolia*	A Twigrush																							g	u	2303
Cyperaceae	*Carex appressa*	Tall Sedge	1	x				x					1	x											g	u	2310
Cyperaceae	*Chorizandra cymbaria*	Heron Bristle Rush																			1	x			g	u	2344
Cyperaceae	*Cyperus aggregatus**	-							1	x			1	x	1	x									g	u	8845
Cyperaceae	*brevifolius**	-																							g	u	2353
Cyperaceae	*Cyperus difformis*	-																							g	u	7143
Cyperaceae	*Cyperus eragrostis**	Umbrella Sedge								x				x										x	g	u	2364
Cyperaceae	*Cyperus gracilis*	Slender Flat-sedge							2	x															g	u	2374
Cyperaceae	*Cyperus polystachyos*	A Sedge	2	x	1	x			1	x			1	x	1	x									g	u	8483
Cyperaceae	*Cyperus sesquiflorus**	-	1	x																					g	u	2398
Cyperaceae	*Eleocharis pusilla*	-																									

Family	Scienfic Name	Common Name	Q1	T1	Q2	T2	Q3	T3	Q4	T4	Q5	T5	Q6	T6	Q7	T7	Q8	T8	Q9	T9	Q10	T10	Q11	T11	Form	Status	Caps
Cyperaceae	*Fimbristylis dichotoma*	Common Fringe-sedge	1	x														x	2	x	2	x			g	u	7435
Cyperaceae	*Gahnia aspera*	Rough Saw-sedge	1	x																					g	u	2431
Cyperaceae	*Gahnia clarkei*	Tall Saw-sedge																							g	u	2432
Cyperaceae	*Gahnia sieberiana*	Red-fruit Saw-sedge									1		3	x	1	x	1	x		x			1	x	g	P13	2442
Cyperaceae	*Isolepis inundata*	Swamp Clubrush																							g	u	2454
Cyperaceae	*Isolepis nodosa*	Knobby Club-rush				x															1	x			g	u	2457
Cyperaceae	*Juncus usitatus*	-	1	x		x					1	x	1	x		x							1	x	g	u	3350
Cyperaceae	*Lepidosperma laterale*	Variable Sword-sedge		x													1	x					2	x	g	u	6402
Cyperaceae	*Ptilothrix deusta*	-																							g	u	8956
Cyperaceae	*Schoenus apogon*	Fluke Bogrush																	1	x	2	x			g	u	2491
Cyperaceae	*Schoenus brevifolius*	A Bog Rush																	1		1	x	1	x	g	u	2492
Cyperaceae	*Schoenus ericetorum*	A Bog Rush																							g	u	2495
Dennstaedtiaceae	*Histiopteris incisa*	Bat's Wing Fern																							g	u	7271
Dennstaedtiaceae	*Pteridium esculentum*	Bracken			3	x	4	x	4	x	2	x	4	x	3	x	2	x					3	x	f	P13	6403
Dicksoniaceae	*Calochlaena dubia*	Dicksoniaceae																							f	P13	8341
Dilleniaceae	*Hibbertia acicularis*	Prickly Guinea Flower																							g	u	2526
Dilleniaceae	*Hibbertia aspera*	Rough Guinea Flower															1			x					g	u	2527
Dilleniaceae	*Hibbertia linearis*	-							1	x													1	x	s	u	2539
Dilleniaceae	*obtusifolia*	-					1																		s	u	2542
Dilleniaceae	*Hibbertia scandens*	Climbing Guinea Flower	1	x	2	x	2	x	1	x	1	x	2	x	1	x								x	v	u	2548
Dilleniaceae	*Hibbertia vestita*	-																					1	x	g	u	2551
Dilleniaceae	*Hibbertia virgata subsp. virgata*	-																							g	u	9398
Droseraceae	*Drosera peltata*	Pygmy Sundew																		x	2	x			g	u	2559
Droseraceae	*Drosera spatulata*	Sundew																	1	x					g	u	2561
Elaeocarpaceae	*Elaeocarpus reticulatus*	Blueberry Ash																					1	x	t	u	2574
Elaeocarpaceae	*Tetratheca thymifolia*	Black-eyed Susan																					1	x	g	u	6214
Ericaceae	*Epacris microphylla*	-																							g	u	2599
Ericaceae	*Epacris pulchella*	NSW Coral Heath													1	x			2	x		x			s	u	2605
Ericaceae	*Leucopogon juniperinus*	Prickly Beard-heath																						x	s	u	2623

Family	Scienfic Name	Common Name	Q1	T1	Q2	T2	Q3	T3	Q4	T4	Q5	T5	Q6	T6	Q7	T7	Q8	T8	Q9	T9	Q10	T10	Q11	T11	Form	Status	Caps
Ericaceae	*Leucopogon lanceolatus*	-					1	x	1	x			1	x	1	x					1	x	1	x	s	u	2624
Ericaceae	*Lissanthe strigosa*	Peach Heath					1	x													1	x			s	u	2642
Ericaceae	*Monotoca elliptica*	heath					3	x	1	x															s	u	2647
Ericaceae	*Monotoca scoparia*	-																							s	u	2649
Euphorbiaceae	*oblongifolia*	Coffee Bush	1	x			1	x															1	x	s	u	2695
Euphorbiaceae	*Glochidion ferdinandi var. ferdinandi*	Cheese Tree	1	x	1		1	x																	t	u	9360
Euphorbiaceae	*hirtellus*	-					1	x																	g	u	8216
Euphorbiaceae	*Phyllanthus tenellus**	-																							g	u	2751
Euphorbiaceae	*Ricinocarpos pinifolius*	Wedding Bush																							s	u	2759
Fabaceae (Faboideae)	*Bossiaea heterophylla*	Variable Bossiaea																							s	u	2780
Fabaceae (Faboideae)	*Bossiaea prostrata*	-	1	x																					g	u	2786
Fabaceae (Faboideae)	*Desmodium gunnii*	Slender tick trefoil						x																	v	u	6621
Fabaceae (Faboideae)	*Desmodium rhytidophyllum*	-			1	x			1	x															v	u	2839
Fabaceae (Faboideae)	*Dillwynia retorta var. retorta*	Heathy Parrot Pea																							s	u	11736
Fabaceae (Faboideae)	*Glycine clandestina*	-	2	x	2	x			2	x							2	x					2	x	v	u	2860
Fabaceae (Faboideae)	*Glycine microphylla*	-	1	x																					v	u	7208
Fabaceae (Faboideae)	*Glycine tabacina*	-															1	x							v	u	2861
Fabaceae (Faboideae)	*Gompholobium pinnatum*	Pinnate Wedge Pea																							g	u	2868
Fabaceae (Faboideae)	*Hardenbergia violacea*	False Sarsaparilla	1	x	1	x			1	x	2	x					2	x						x	v	u	2873
Fabaceae (Faboideae)	*Kennedia rubicunda*	Dusky Coral-pea								x	1	x	1	x										x	g	u	2898
Fabaceae (Faboideae)	*Lotus uliginosus**	Birds-foot Trefoil							1	x	1	x	1	x	1	x									g	u	8928
Fabaceae (Faboideae)	*Platylobium formosum*	Handsome Flat-pea																							s	u	2961
Fabaceae (Faboideae)	*Pultenaea blakelyi*	-	1	x																					s	u	2977
Fabaceae (Faboideae)	*Pultenaea daphnoides*	Large-leaf Bush-pea																							s	u	2985
Fabaceae (Faboideae)	*paleacea var. paleacea*	-	1	x															1	x					s	u	7545

Family	Scienfic Name	Common Name	Q1	T1	Q2	T2	Q3	T3	Q4	T4	Q5	T5	Q6	T6	Q7	T7	Q8	T8	Q9	T9	Q10	T10	Q11	T11	Form	Status	Caps
Fabaceae (Faboideae)	*Pultenaea villosa*	-	1	x			2	x		x							1	x			1		1	x	s	u	3023
Fabaceae (Faboideae)	*Trifolium repens**	White Clover	2	x	3	x			2	x	4	x	3	x	4	x									g	u	3085
Fabaceae (Mimosoideae)	*Acacia brownii*	Heath Wattle																							g	u	3723
Fabaceae (Mimosoideae)	*Acacia falcata*	-																							s	u	3771
Fabaceae (Mimosoideae)	*Acacia implexa*	Hickory Wattle					2	x	1	x															t	u	3792
Fabaceae (Mimosoideae)	*Acacia irrorata subsp. irrorata*	Green Wattle		1			2	x									2	x							t	u	6472
Fabaceae (Mimosoideae)	*Acacia longifolia subsp. longifolia*	Sydney Golden Wattle															1	x	1				1	x	s	u	10790
Fabaceae (Mimosoideae)	*Acacia schinoides*	Green Cedar Wattle																							t	u	3874
Fabaceae (Mimosoideae)	*Acacia suaveolens*	Sweet Wattle																							s	u	3881
Fabaceae (Mimosoideae)	*Acacia terminalis*	Sunshine Wattle																							s	u	3885
Fabaceae (Mimosoideae)	*Acacia ulicifolia*	Prickly Moses	1	x							2	x			1			x					1	x	s	u	3893
Geraniaceae	*Geranium homeanum*	-						x						x											g	u	3148
Goodeniaceae	*Dampiera stricta*	Blue Damperia																							g	u	3174
Goodeniaceae	*Goodenia bellidifolia subsp. bellidifolia*	-																	1		1	x			g	u	8711
Goodeniaceae	*Goodenia heterophylla subsp. heterophylla*	Variable-leaved Goodenia					x										1	x	2	x					g	u	10197
Goodeniaceae	*Goodenia ovata*	Hop Goodenia																x							s	u	3192
Goodeniaceae	*Goodenia paniculata*	-																	3	x	3	x			g	u	7057
Haemodoraceae	*Haemodorum planifolium*	Blood Root																							g	u	3236
Haloragaceae	*Gonocarpus micranthus subsp. ramosissimus*	-																			2	x			g	u	8648
Haloragaceae	*Gonocarpus tetragynus*	-																	2	x					g	u	3247
Haloragaceae	*Gonocarpus teucrioides*	Raspwort	1	x													2	x						x	g	u	3248
Hypoxidaceae	*Hypoxis hygrometrica*	Golden Weather-grass	2	x													1								g	u	3553
Iridaceae	*Crocosmia X crocosmiiflora**	Montbretia																							g	u	10271

Family	Scienfic Name	Common Name	Q1	T1	Q2	T2	Q3	T3	Q4	T4	Q5	T5	Q6	T6	Q7	T7	Q8	T8	Q9	T9	Q10	T10	Q11	T11	Form	Status	Caps
Iridaceae	*Patersonia glabrata*	Leafy Purple-flag																							g	u	3301
Iridaceae	*Patersonia sericea*	Silky Purple-Flag																							g	u	3303
Juncaceae	*Juncus cognatus**	-											1	x											g	u	3325
Juncaceae	*Juncus continuus*	A Rush														x									g	u	3326
Juncaceae	*Juncus prismatocarpus*	Branching Rush							1	x															g	u	3342
Lamiaceae	*Clerodendrum tomentosum*	Hairy Clerodendrum						x																	s	u	6484
Lamiaceae	*Stachys arvensis**	Stagger Weed												x											g	u	3450
Lauraceae	*Cassytha glabella f. glabella*	Slender Devil's Twine																							v	u	3467
Lauraceae	*Cassytha pubescens*	Common Devil's Twine																			1	x	1	x	v	u	3469
Lauraceae	*Cinnamomum camphora**	Camphor Laurel				x																			t	u	3471
Lauraceae	*Endiandra sieberi*	Hard Corkwood			1		2	x	3	x															t	u	3495
Lindsaeaceae	*Lindsaea linearis*	Screw Fern																							f	u	6406
Lindsaeaceae	*Lindsaea microphylla*	Lacy Wedge Fern																							f	u	6401
Lobeliaceae	*Lobelia alata*	Angled Lobelia																	1	x	2	x			g	u	1916
Lobeliaceae	*purpurascens*	Whiteroot	2	x			1	x	1	x			2	x	2	x	2	x	1	x			2	x	g	u	1925
Loganiaceae	*Mitrasacme polymorpha*	-																							g	u	3595
Lomandraceae	*Lomandra filiformis subsp. filiformis*	-	1	x																					g	u	7931
Lomandraceae	*Lomandra glauca subsp. glauca*	Pale Mat-rush																							g	u	6304
Lomandraceae	*Lomandra longifolia*	Spiny-headed Mat-rush			1	x	2	x			2	x	3	x	1	x	3	x		x		x	2	x	g	u	6308
Lomandraceae	*multiflora subsp.*	Many-flowered Mat-rush	3	x			1	x	2	x															g	u	8802
Lomandraceae	*Lomandra obliqua*	Fish Bones																							g	u	6312
Loranthaceae	*Amyema congener*	A mistletoe								x															e	u	3600
Luzuriagaceae	*Eustrephus latifolius*	Wombat Berry					1	x	1	x															v	u	6015
Luzuriagaceae	*Geitonoplesium cymosum*	Scrambling Lily					1	x																	v	u	6016
Malvaceae	*Sida rhombifolia**	Paddy's Lucerne			2	x			2	x			1	x											g	u	3673
Meliaceae	*glandulosum subsp. glandulosum*	Scentless Rosewood					1	x																	t	u	11178
Menispermaceae	*Sarcopetalum harveyanum*	Pearl Vine					1	x																	v	u	3688

Family	Scienfic Name	Common Name	Q1	T1	Q2	T2	Q3	T3	Q4	T4	Q5	T5	Q6	T6	Q7	T7	Q8	T8	Q9	T9	Q10	T10	Q11	T11	Form	Status	Caps
Menispermaceae	*Stephania japonica var. discolor*	Snake Vine					1	x																	v	u	8428
Menyanthaceae	*Villarsia exaltata*	Yellow Marsh Flower											1												g	u	3692
Moraceae	*Ficus sp. (Seedling)*	A Fig								x															t	u	-
Myrtaceae	*Angophora costata*	Smooth-barked Apple					3	x	4	x	4	x		x	2	x		x	3	x					t	u	3970
Myrtaceae	*Babingtonia pluriflora*	-															1	x							s	u	10678
Myrtaceae	*Callistemon citrinus*	Crimson Bottlebrush																		x					s	P13	4004
Myrtaceae	*Callistemon pachyphyllus*	Wallum Bottlebrush																	1	x	2	x			s	P13	4010
Myrtaceae	*Callistemon pinifolius*	Pine-leaved Bottlebrush																	2	x					s	P13	4013
Myrtaceae	*Callistemon salignus*	Willow Bottlebrush		x													2	x							s	P13	4015
Myrtaceae	*Corymbia gummifera*	Red Bloodwood				x	2	x		x	2	x											4	x	t	u	9687
Myrtaceae	*Corymbia maculata*	Spotted Gum	4	x																					t	u	9692
Myrtaceae	*Eucalyptus fergusonii subsp. fergusonii*	-																							t	3KC	8355
Myrtaceae	*Eucalyptus globoidea*	White Stringybark	2	x																					t	u	4097
Myrtaceae	*Eucalyptus microcorys*	Tallowwood						x	3	x							5	x							t	u	4128
Myrtaceae	*Eucalyptus paniculata subsp. paniculata*	Grey Ironbark	3	x																					t	u	4149
Myrtaceae	*Eucalyptus pilularis*	Blackbutt			4	x	4	x					4	x											t	u	4155
Myrtaceae	*Eucalyptus canaliculata*	Large-fruited Grey Gum																							t	u	?
Myrtaceae	*Eucalyptus propinqua*	Small-fruited Grey Gum	2	x																					t	u	4162
Myrtaceae	*Eucalyptus resinifera subsp. resinifera*	Red Mahogany	2	x														x	2	x			2	x	t	u	9793
Myrtaceae	*Eucalyptus robusta*	Swamp Mahogany								x	4	x	3	x			2	x			3	x	1	x	t	u	4171
Myrtaceae	*Eucalyptus signata*	Northern Scribbly Gum													5	x									t	u	4183
Myrtaceae	*Eucalyptus umbra*	Broad-leaved White Mahogany	1	x							1														t	u	4196
Myrtaceae	*Leptospermum liversidgei*	-													1	x			1	x	2	x			s	u	4224

Family	Scienfic Name	Common Name	Q1	T1	Q2	T2	Q3	T3	Q4	T4	Q5	T5	Q6	T6	Q7	T7	Q8	T8	Q9	T9	Q10	T10	Q11	T11	Form	Status	Caps
Myrtaceae	*Leptospermum polygalifolium subsp. polygalifolium*	Yellow Tea-tree		x							2	x							1	x	1	x	1	x	s	u	8197
Myrtaceae	*Melaleuca ericifolia*	Swamp Paperbark																			1	x			s	P13	6391
Myrtaceae	*Melaleuca linariifolia*	Snow-in-Summer															1	x							t	u	4257
Myrtaceae	*Melaleuca nodosa*	Ball Honeymyrtle		x						x	2	x			1	x			1	x					s	u	4258
Myrtaceae	*Melaleuca quinquenervia*	Broad-leaved Paperbark									1	x		x						x					t	u	4260
Myrtaceae	*Melaleuca sieberi*	-									1	x							4	x	2	x			s	u	4261
Myrtaceae	*thymifolia*	-															1	x	2	x	2	x			s	u	4266
Oleaceae	*Notelaea longifolia*	Large Mock-olive			1	x	1	x																	s	u	4318
Oleaceae	*Notelaea ovata*	-																							s	u	4321
Orchidaceae	*fornicatus*	Pixie Caps																							g	u	4353
Orchidaceae	*Cryptostylis Sp. (Leaf only)*	A Tongue Orchid	1																						g	-	-
Oxalidaceae	*Oxalis corniculata**	Creeping Oxalis								x				x			1	x							g	u	4613
Oxalidaceae	*Oxalis exilis*	Slender xalis																							g	u	4615
Phormiaceae	*Dianella caerulea var. caerulea*	Blue Flax lily	1	x					1	x															g	P13	6700
Phormiaceae	*Dianella caerulea var. producta*	Blue Flax lily					2	x			2	x	2	x	1	x	1	x	2	x	1	x	2	x	g	P13	7337
Phylydraceae	*Phylidrum lanuginosum*	Woolly Frogsmouth																									
Pinaceae	*Pinus elliottii**	Slash Pine			1	x																	1	x	t	u	11138
Pittosporaceae	*Billardiera scandens*	Appleberry					1	x									1	x					1	x	v	u	4671
Pittosporaceae	*Pittosporum revolutum*	Rough Fruit Pittosporum															1								s	u	4683
Pittosporaceae	*Pittosporum undulatum*	Sweet Pittosporum					1	x	1	x															t	u	4685
Poaceae	*Andropogon virginicus**	Whisky Grass											1	x	1	x			1	x			5	x	g	u	4748
Poaceae	*Aristida benthamii*	-				x													3	x					g	u	4755
Poaceae	*Aristida vagans*	Threeawn Speargrass	1	x													1	x							g	u	4773
Poaceae	*Austrodanthonia tenuior*	-																	2	x					g	u	10633
Poaceae	*Austrostipa scabra subsp. scabra*	A Speargrass																					2	x	g	u	10378
Poaceae	*Axonopus fissifolius**	Narrow-leaved Carpet Grass	2	x	3	x			2	x	2	x	3	x	3	x	3	x	3	x	2	x	2	x	g	u	11194
Poaceae	*Chloris gayana**	Rhodes Grass								x	1	x													g	u	4831

Family	Scienfic Name	Common Name	Q1	T1	Q2	T2	Q3	T3	Q4	T4	Q5	T5	Q6	T6	Q7	T7	Q8	T8	Q9	T9	Q10	T10	Q11	T11	Form	Status	Caps
Poaceae	*Chloris truncata**	Windmill Grass												x											g	u	4833
Poaceae	*Cymbopogon refractus*	Barbed Wire Grass				x			1	x							1		1	x					g	u	4841
Poaceae	*Cynodon dactylon*	Common Couch			1	x			1	x	2	x	2	x	2	x	1	x		x					g	u	6540
Poaceae	*Dichelachne micrantha*	Shorthair Plumegrass			1	x						x				x									g	u	4898
Poaceae	*Digitaria parviflora*	Small-flowered Finger Grass					2	x	1	x	1	x	1	x									1	x	g	u	4913
Poaceae	*Digitaria sanguinalis**	Crab Grass			2	x			1	x				x											g	u	6937
Poaceae	*Echinopogon caespitosus var. caespitosus*	Tufted Hedgehog Grass															1	x					1	x	g	u	7593
Poaceae	*Echinopogon ovatus*	Forest Hedgehog Grass	2	x									1	x											g	u	4934
Poaceae	*Ehrharta erecta**	Panic Veldtgrass							1	x			2	x											g	u	4937
Poaceae	*Entolasia marginata*	Bordered Panic	1	x			2	x			1	x											2	x	g	u	4946
Poaceae	*Entolasia stricta*	Wiry Panic	3	x													3	x	1	x	3	x	2	x	g	u	4947
Poaceae	*Eragrostis brownii*	Brown's Lovegrass		x	1	x								x				x	1	x		x		x	g	u	7921
Poaceae	*Eragrostis curvula**	Lovegrass				x						x													g	u	4952
Poaceae	*Eragrostis leptostachya*	Paddock Lovegrass	1	x	1	x			1	x	1	x							2	x	2	x	1	x	g	u	4960
Poaceae	*uncinata*	Matgrass																	3	x	3	x			g	u	5001
Poaceae	*Imperata cylindrica var. major*	Blady Grass	2	x	3	x	3	x	2	x					2	x	3	x	1	x	2	x	2	x	g	u	8511
Poaceae	*Ischaemum australe*	-																			1	x			g	u	9278
Poaceae	*Leersia hexandra*	Swamp Ricegrass																							g	u	5024
Poaceae	*stipoides var. stipoides*	-	2	x	1	x			2	x			1	x			2	x		x			3	x	g	u	7707
Poaceae	*Oplismenus aemulus*	-					1	x	1	x				x			2	x							g	u	5044
Poaceae	*Oplismenus imbecillis*	-					1	x																	g	u	5045
Poaceae	*Panicum simile*	Two-colour Panic		x	1	x											1	x	1	x	1	x	2	x	g	u	5066
Poaceae	*distans*	-	2	x	1	x	2	x							1	x									g	u	7172
Poaceae	*Paspalum dilatatum**	Paspalum	1	x	2	x			2	x	2	x	2	x	3	x	2	x	2	x	2	x			g	u	5086
Poaceae	*distichum*	Water Couch																							g	u	5087
Poaceae	*Paspalum orbiculare*	Ditch Millet							1	x	1	x													g	u	5089
Poaceae	*Paspalum urvillei**	Vasey Grass		x	1	x										x					1	x			g	u	5093
Poaceae	*Paspalum wettsteinii**	Broad-leaved Paspalum							2	x	1	x	1	x				x							g	u	8715

Family	Scienfic Name	Common Name	Q1	T1	Q2	T2	Q3	T3	Q4	T4	Q5	T5	Q6	T6	Q7	T7	Q8	T8	Q9	T9	Q10	T10	Q11	T11	Form	Status	Caps
Poaceae	*Pennisetum alopecuroides**	Swamp Foxtail				x			1	x									1		1	x			g	u	5094
Poaceae	*Pennisetum clandestinum**	Kikuyu Grass			3	x			3	x	3	x	2	x	2	x									g	u	5096
Poaceae	*Setaria pumila**	Pale Pigeon Grass			3	x			3	x	5	x			2	x					1	x			g	u	7842
Poaceae	*Sporobolus creber*	Slender Rat's Tail Grass							2	x					1	x									g	u	5179
Poaceae	*Stenotaphrum secundatum**	Buffalo Grass																							g	u	5185
Poaceae	*Themeda australis*	Kangaroo Grass	1	x			1				1	x			1	x	1	x	2	x	2	x			g	u	5219
Polygonaceae	*decipiens*	Knotweed																x							w	u	7568
Polygonaceae	*Rumex bidens*	Mud Dock																									
Portulacaceae	*Portulaca oleracea*	Purslane																									
Proteaceae	*Banksia oblongifolia*	Fern-leaved Banksia																							s	P13	5345
Proteaceae	*Banksia serrata*	Old-man Banksia			2																				t	u	5348
Proteaceae	*Banksia spinulosa var. spinulosa*	-																							s	P13	7488
Proteaceae	*Lomatia silaifolia*	Crinkle Bush																							g	P13	5445
Proteaceae	*Persoonia lanceolata*	Lance Leaf Geebung																							s	P13	5460
Proteaceae	*Persoonia levis*	Broad-leaved Geebung																						x	s	P13	5462
Proteaceae	*Persoonia linearis*	Narrow-leaved Geebung																							s	P13	5463
Ranunculaceae	*Clematis aristata*	Old Man's Beard					1	x																	v	u	5493
Restionaceae	*Baloskion tetraphyllum subsp. meiostachyum*	-							2	x	2	x	3	x	2	x							1	x	g	u	10614
Restionaceae	*Empodisma minus*	Spreading Rope-rush															1	x			1	x			g	u	5532
Restionaceae	*Leptocarpus tenax*	-																			2	x			g	u	5534
Restionaceae	*Lepyrodia muelleri*	Scale Rush																	1	x		x			g	u	5540
Restionaceae	*Lepyrodia scariosa*	Scale Rush																	3	x	3	x			g	u	5541
Rubiaceae	*Galium propinquum*	Maori Bedstraw																							g	u	5688
Rubiaceae	*Opercularia diphylla*	-															1	x		x					g	u	5698
Rubiaceae	*Opercularia varia*	Variable Stinkweed																							g	u	5701
Rubiaceae	*Pomax umbellata*	Pomax			2	x	4	x	3	x	2	x	3	x									3	x	g	u	5703
Rutaceae	*Boronia pinnata*	-																							g	P13	5750
Rutaceae	*Nematolepis squamea subsp. squamea*	Satinwood					1																		s	u	10742

Family	Scienfic Name	Common Name	Q1	T1	Q2	T2	Q3	T3	Q4	T4	Q5	T5	Q6	T6	Q7	T7	Q8	T8	Q9	T9	Q10	T10	Q11	T11	Form	Status	Caps
Rutaceae	*Zieria smithii*	Sandfly Zieria															1								s	u	5847
Santalaceae	*Leptomeria acida*	Sour Currant Bush																							s	u	5865
Sapindaceae	*Dodonaea triquetra*	Large-leaf Hop-bush					1	x									2	x					2	x	s	u	5911
Scrophulariaceae	*Veronica plebeia*	Trailing Speedwell	1	x																					g	u	6009
Selaginellaceae	*Selaginella uliginosa*	Swamp Selaginella																	1	x	2	x			g	u	8187
Smilacaceae	*Smilax australis*	Lawyer Vine						x																	v	u	7592
Smilacaceae	*Smilax glyciphylla*	Sweet Sarsparilla							2	x	1	x											3	x	v	u	6022
Solanaceae	*Solanum mauritianum**	Wild Tobacco Bush																							s	u	6090
Solanaceae	*Solanum nigrum**	Black-berry Nightshade	1										1	x											g	u	6091
Stylidiaceae	*Stylidium graminifolium*	Grass Triggerplant																							g	u	6157
Thymelaeaceae	*Pimelea linifolia subsp. linifolia*	Slender Rice-flower																							g	u	6814
Verbenaceae	*Lantana camara**	Lantana			1	x	1	x	1	x			1												s	u	6248
Verbenaceae	*Verbena bonariensis**	Purpletop									1	x				x									g	u	6256
Violaceae	*Hybanthus monopetalus*	Slender Violet-bush																							g	u	6266
Violaceae	*Viola banksii*	-	1	x				x	1					x											g	u	11863
Vitaceae	*clematidea*	Slender Grape						x																	v	u	6281
Xanthorrhoeaceae	*Xanthorrhoea fulva*	Grasstree									2	x													g	u	8771
Xanthorrhoeaceae	*Xanthorrhoea latifolia subsp. latifolia*	-																			3	x			g	u	9309
Xanthorrhoeaceae	*Xanthorrhoea macronema*	-																							g	P13	6318
Xyridaceae	*Xyris complanata*	-																							g	u	7247
Zamiaceae	*Macrozamia communis*	Burrawang					1	x																	s	P13	6327

Family	Scienfic Name	Common Name	Q12	T12	Q13	T13	Q14	T14	Q15	T15	Q16	T16	Q17	T17	Q18	T18	Q19	T19	Q20	T20	Q21	T21	Form	Status	Caps
Anthericaceae	*Caesia parviflora var. parviflora*	-																				x	g	u	7183
Anthericaceae	*Thysanotus tuberosus*	Common Fringe-lily		x																			g	u	3574
Anthericaceae	*Tricoryne elatior*	lily	1	x	2	x																	g	u	7355
Apiaceae	*Centella asiatica*	Pennywort					2	x															g	u	1106
Apiaceae	*Hydrocotyle bonariensis**	A Pennywort																					g	u	1123
Apiaceae	*Hydrocotyle peduncularis*	-	2	x			1				2	x											g	u	1130
Apiaceae	*Platysace ericoides*	-							3	x					2	x							g	u	1143
Apiaceae	*Platysace lanceolata*	Native Parsnip													3	x	1	x				x	s	u	1144
Apiaceae	*Platysace linearifolia*	Narrow-leafed Platysace			2	x													x				s	u	1145
Apocynaceae	*Gomphocarpus fruticosus**	Narrow-leaved Cotton Bush																					s	u	1227
Apocynaceae	*Parsonsia straminea*	Common Silkpod																					v	u	1185
Araliaceae	*sambucifolia subsp. sambucifolia*	-			1	x	1				1	x	1	x									s	u	12373
Arecaceae	*Livistona australis*	Cabbage Palm									1							x					t	P13	1221
Asparagaceae	*Asparagus aethiopicus**	Asparagus Fern									1												g	u	11784
Asteraceae	*Bidens pilosa**	Cobbler's Pegs					1	x			1		1	x									g	u	1283
Asteraceae	*monilifera subsp. rotundata*	Bitou Bush									1												s	u	8686
Asteraceae	*Cirsium vulgare**	Spear Thistle																	x				g	u	1400
Asteraceae	*Conyza bonariensis**	Flaxleaf Fleabane											1	x					x			x	g	u	1404
Asteraceae	*Conyza sumatrensis**	Tall fleabane						x						x									g	u	10442
Asteraceae	*Crassocephalum crepidioides**	Thickhead																					g	u	1421
Asteraceae	*Epaltes australis*	Spreading Nut-heads																					g	u	7425
Asteraceae	*Hypochaeris radicata**	Catsear			1	x	1	x					2	x					2	x	2	x	g	u	8788
Asteraceae	*Lagenifera stipitata*	Blue Bottle-daisy		x	1	x	1	x			1	x											g	u	1551
Asteraceae	*Senecio diaschides*	-																					g	u	7914

Family	Scienfic Name	Common Name	Q12	T12	Q13	T13	Q14	T14	Q15	T15	Q16	T16	Q17	T17	Q18	T18	Q19	T19	Q20	T20	Q21	T21	Form	Status	Caps
Asteraceae	*Senecio madagascariensis**	Fireweed							1		1		2	x								x	g	u	6465
Asteraceae	*Sigesbeckia orientalis subsp. orientalis*	Indian Weed															1	x					g	u	8789
Asteraceae	*Taraxacum officinale**	Dandelion					2	x		x							1	x	x				g	u	1698
Asteraceae	*Vernonia cinerea var. cinerea*	-										x											g	u	9254
Baueraceae	*Bauera rubioides*	Dog Rose								x													g	u	2268
Bignoniaceae	*Pandorea pandorana*	Wonga Wonga Vine									2	x											g	u	1740
Blechnaceae	*Blechnum indicum*	Swamp Water Fern															3	x					g	u	8057
Blechnaceae	*Doodia aspera*	Prickly Rasp Fern									1	x											f	u	8064
Cactaceae	*Opuntia stricta var. stricta**	Common Prickly Pear																					s	u	7659
Campanulaceae	*Wahlenbergia gracilis*	Australian Bluebell		x		x																	g	u	1934
Caryophyllaceae	*Stellaria media**	Common Chickweed																	x			x	g	u	2006
Casuarinaceae	*Allocasuarina littoralis*	Black Sheoak									1	x	1	x									t	u	2012
Clusiaceae	*Hypericum gramineum*	Small St John's Wort																	2	x			g	u	7240
Clusiaceae	*Hypericum japonicum*	-					1																g	u	2203
Commelinaceae	*Commelina cyanea*	Native Wandering Jew																					g	u	2209
Convolvulaceae	*Dichondra repens*	Kidney Weed		x			2	x											1	x			g	u	2222
Convolvulaceae	*Polymeria calycina*	Polymeria					1	x															g	u	2231
Cyperaceae	*Baumea articulata*	Jointed Twig-rush																					g	u	2296
Cyperaceae	*Baumea rubiginosa*	-	1	x											1	x		x					g	u	2302
Cyperaceae	*Baumea teretifolia*	A Twigrush		x													2	x					g	u	2303
Cyperaceae	*Carex appressa*	Tall Sedge					1	x							1	x	1	x					g	u	2310
Cyperaceae	*Chorizandra cymbaria*	Heron Bristle Rush	2	x			1	x															g	u	2344
Cyperaceae	*Cyperus aggregatus**	-																					g	u	8845
Cyperaceae	*brevifolius**	-																					g	u	2353
Cyperaceae	*Cyperus difformis*	-																					g	u	7143
Cyperaceae	*Cyperus eragrostis**	Umbrella Sedge																	x				g	u	2364
Cyperaceae	*Cyperus gracilis*	Slender Flat-sedge																					g	u	2374
Cyperaceae	*Cyperus polystachyos*	A Sedge						x															g	u	8483
Cyperaceae	*Cyperus sesquiflorus**	-																					g	u	2398

Family	Scienfic Name	Common Name	Q12	T12	Q13	T13	Q14	T14	Q15	T15	Q16	T16	Q17	T17	Q18	T18	Q19	T19	Q20	T20	Q21	T21	Form	Status	Caps
Cyperaceae	*Eleocharis pusilla*	-																	2	x	1	x			
Cyperaceae	*Fimbristylis dichotoma*	Common Fringe-sedge					1	x											2	x	1	x	g	u	7435
Cyperaceae	*Gahnia aspera*	Rough Saw-sedge																					g	u	2431
Cyperaceae	*Gahnia clarkei*	Tall Saw-sedge						x			1		2				2	x					g	u	2432
Cyperaceae	*Gahnia sieberiana*	Red-fruit Saw-sedge	2	x					2	x						x							g	P13	2442
Cyperaceae	*Isolepis inundata*	Swamp Clubrush						x															g	u	2454
Cyperaceae	*Isolepis nodosa*	Knobby Club-rush																	3	x	2	x	g	u	2457
Cyperaceae	*Juncus usitatus*	-																					g	u	3350
Cyperaceae	*Lepidosperma laterale*	Variable Sword-sedge			1	x					2	x											g	u	6402
Cyperaceae	*Ptilothrix deusta*	-													1	x							g	u	8956
Cyperaceae	*Schoenus apogon*	Fluke Bogrush	1	x												x	1	x			3	x	g	u	2491
Cyperaceae	*Schoenus brevifolius*	A Bog Rush	2	x													2	x	2	x			g	u	2492
Cyperaceae	*Schoenus ericetorum*	A Bog Rush													1	x	1						g	u	2495
Dennstaedtiaceae	*Histiopteris incisa*	Bat's Wing Fern																					g	u	7271
Dennstaedtiaceae	*Pteridium esculentum*	Bracken					1	x	3	x	2	x	3	x		x						x	f	P13	6403
Dicksoniaceae	*Calochlaena dubia*	Dicksoniaceae																					f	P13	8341
Dilleniaceae	*Hibbertia acicularis*	Prickly Guinea Flower													1	x							g	u	2526
Dilleniaceae	*Hibbertia aspera*	Rough Guinea Flower	2	x	2	x					1	x											g	u	2527
Dilleniaceae	*Hibbertia linearis*	-																					s	u	2539
Dilleniaceae	*obtusifolia*	-																					s	u	2542
Dilleniaceae	*Hibbertia scandens*	Climbing Guinea Flower									1	x	1										v	u	2548
Dilleniaceae	*Hibbertia vestita*	-	2	x			1	x	1			x	2	x									g	u	2551
Dilleniaceae	*Hibbertia virgata subsp. virgata*	-													3	x							g	u	9398
Droseraceae	*Drosera peltata*	Pygmy Sundew														x			2	x			g	u	2559
Droseraceae	*Drosera spatulata*	Sundew							1	x	2	x			1	x					2	x	g	u	2561
Elaeocarpaceae	*Elaeocarpus reticulatus*	Blueberry Ash																					t	u	2574
Elaeocarpaceae	*Tetratheca thymifolia*	Black-eyed Susan									1										3	x	g	u	6214
Ericaceae	*Epacris microphylla*	-	1	x											1								g	u	2599
Ericaceae	*Epacris pulchella*	NSW Coral Heath	2	x	2	x		x	2	x	1	x	1	x	2	x	2	x					s	u	2605

Family	Scienfic Name	Common Name	Q12	T12	Q13	T13	Q14	T14	Q15	T15	Q16	T16	Q17	T17	Q18	T18	Q19	T19	Q20	T20	Q21	T21	Form	Status	Caps
Ericaceae	*Leucopogon juniperinus*	Prickly Beard-heath						x														x	s	u	2623
Ericaceae	*Leucopogon lanceolatus*	-			1	x	1		2	x			1	x	1	x		x					s	u	2624
Ericaceae	*Lissanthe strigosa*	Peach Heath																					s	u	2642
Ericaceae	*Monotoca elliptica*	heath													1	x	1						s	u	2647
Ericaceae	*Monotoca scoparia*	-													2	x							s	u	2649
Euphorbiaceae	*oblongifolia*	Coffee Bush									1		2	x									s	u	2695
Euphorbiaceae	*Glochidion ferdinandi var. ferdinandi*	Cheese Tree		x			2	x				x	2	x									t	u	9360
Euphorbiaceae	*hirtellus*	-			2	x	2	x			2	x	2	x								x	g	u	8216
Euphorbiaceae	*Phyllanthus tenellus**	-													1	x							g	u	2751
Euphorbiaceae	*Ricinocarpos pinifolius*	Wedding Bush													1	x							s	u	2759
Fabaceae (Faboideae)	*Bossiaea heterophylla*	Variable Bossiaea													1	x							s	u	2780
Fabaceae (Faboideae)	*Bossiaea prostrata*	-									1												g	u	2786
Fabaceae (Faboideae)	*Desmodium gunnii*	Slender tick trefoil																					v	u	6621
Fabaceae (Faboideae)	*Desmodium rhytidophyllum*	-																					v	u	2839
Fabaceae (Faboideae)	*Dillwynia retorta var. retorta*	Heathy Parrot Pea							1	x					2	x							s	u	11736
Fabaceae (Faboideae)	*Glycine clandestina*	-		x	2	x	1	x			2	x											v	u	2860
Fabaceae (Faboideae)	*Glycine microphylla*	-									1	x											v	u	7208
Fabaceae (Faboideae)	*Glycine tabacina*	-			1	x	1	x			1												v	u	2861
Fabaceae (Faboideae)	*Gompholobium pinnatum*	Pinnate Wedge Pea															1	x					g	u	2868
Fabaceae (Faboideae)	*Hardenbergia violacea*	False Sarsaparilla					1	x			2	x	1	x									v	u	2873
Fabaceae (Faboideae)	*Kennedia rubicunda*	Dusky Coral-pea															1	x					g	u	2898
Fabaceae (Faboideae)	*Lotus uliginosus**	Birds-foot Trefoil																	x				g	u	8928
Fabaceae (Faboideae)	*Platylobium formosum*	Handsome Flat-pea									1	x											s	u	2961
Fabaceae (Faboideae)	*Pultenaea blakelyi*	-																					s	u	2977
Fabaceae (Faboideae)	*Pultenaea daphnoides*	Large-leaf Bush-pea									1	x											s	u	2985
Fabaceae (Faboideae)	*Pultenaea paleacea var. paleacea*	-	1	x	2	x	1	x			1	x											s	u	7545

Family	Scienfic Name	Common Name	Q12	T12	Q13	T13	Q14	T14	Q15	T15	Q16	T16	Q17	T17	Q18	T18	Q19	T19	Q20	T20	Q21	T21	Form	Status	Caps
Fabaceae (Faboideae)	*Pultenaea villosa*	-		x			1	x		x	1						2	x					s	u	3023
Fabaceae (Faboideae)	*Trifolium repens**	White Clover						x					1	x									g	u	3085
Fabaceae (Mimosoideae)	*Acacia brownii*	Heath Wattle									1	x											g	u	3723
Fabaceae (Mimosoideae)	*Acacia falcata*	-										x											s	u	3771
Fabaceae (Mimosoideae)	*Acacia implexa*	Hickory Wattle																					t	u	3792
Fabaceae (Mimosoideae)	*Acacia irrorata subsp. irrorata*	Green Wattle		x							1	x	1	x									t	u	6472
Fabaceae (Mimosoideae)	*Acacia longifolia subsp. longifolia*	Sydney Golden Wattle	3	x			1		1	x	1	x	1	x			1	x					s	u	10790
Fabaceae (Mimosoideae)	*Acacia schinoides*	Green Cedar Wattle																					t	u	3874
Fabaceae (Mimosoideae)	*Acacia suaveolens*	Sweet Wattle							1				1	x									s	u	3881
Fabaceae (Mimosoideae)	*Acacia terminalis*	Sunshine Wattle							1	x						x							s	u	3885
Fabaceae (Mimosoideae)	*Acacia ulicifolia*	Prickly Moses			2	x					1	x	2	x	1	x	1	x					s	u	3893
Geraniaceae	*Geranium homeanum*	-																					g	u	3148
Goodeniaceae	*Dampiera stricta*	Blue Damperia														x	2	x					g	u	3174
Goodeniaceae	*Goodenia bellidifolia subsp. bellidifolia*	-	1	x															2	x	2	x	g	u	8711
Goodeniaceae	*Goodenia heterophylla subsp. heterophylla*	Variable-leaved Goodenia						x			1	x											g	u	10197
Goodeniaceae	*Goodenia ovata*	Hop Goodenia																					s	u	3192
Goodeniaceae	*Goodenia paniculata*	-	1	x			1	x	1	x							2	x	2	x	2	x	g	u	7057
Haemodoraceae	*Haemodorum planifolium*	Blood Root															1	x					g	u	3236
Haloragaceae	*Gonocarpus micranthus subsp. ramosissimus*	-							2	x			1	x	2	x	2	x					g	u	8648
Haloragaceae	*Gonocarpus tetragynus*	-																					g	u	3247
Haloragaceae	*Gonocarpus teucrioides*	Raspwort	2	x			3	x		x			2	x							2	x	g	u	3248
Hypoxidaceae	*Hypoxis hygrometrica*	Golden Weather-grass	1	x			1	x															g	u	3553
Iridaceae	*Crocosmia X crocosmiiflora**	Montbretia																					g	u	10271

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Iridaceae	*Patersonia glabrata*	Leafy Purple-flag			1	x																	g	u	3301
Iridaceae	*Patersonia sericea*	Silky Purple-Flag													2	x		x					g	u	3303
Juncaceae	*Juncus cognatus**	-																					g	u	3325
Juncaceae	*Juncus continuus*	A Rush																					g	u	3326
Juncaceae	*Juncus prismatocarpus*	Branching Rush																					g	u	3342
Lamiaceae	*Clerodendrum tomentosum*	Hairy Clerodendrum																					s	u	6484
Lamiaceae	*Stachys arvensis**	Stagger Weed																					g	u	3450
Lauraceae	*Cassytha glabella f. glabella*	Slender Devil's Twine															2	x					v	u	3467
Lauraceae	*Cassytha pubescens*	Common Devil's Twine																					v	u	3469
Lauraceae	*Cinnamomum camphora**	Camphor Laurel																					t	u	3471
Lauraceae	*Endiandra sieberi*	Hard Corkwood																					t	u	3495
Lindsaeaceae	*Lindsaea linearis*	Screw Fern		x			1			x													f	u	6406
Lindsaeaceae	*Lindsaea microphylla*	Lacy Wedge Fern									1	x											f	u	6401
Lobeliaceae	*Lobelia alata*	Angled Lobelia						x								x		x					g	u	1916
Lobeliaceae	*Pratia purpurascens*	Whiteroot	2	x	2	x	2	x		x	3	x							2	x	2	x	g	u	1925
Loganiaceae	*Mitrasacme polymorpha*	-															1	x					g	u	3595
Lomandraceae	*Lomandra filiformis subsp. filiformis*	-			3	x			1	x	3	x											g	u	7931
Lomandraceae	*Lomandra glauca subsp. glauca*	Pale Mat-rush							2	x					2	x							g	u	6304
Lomandraceae	*Lomandra longifolia*	Spiny-headed Mat-rush		x	2	x	2	x	3	x	2	x	3	x	1	x	2	x			2	x	g	u	6308
Lomandraceae	*multiflora subsp.*	Many-flowered Mat-rush			1	x	1	x															g	u	8802
Lomandraceae	*Lomandra obliqua*	Fish Bones					1				1	x	1	x									g	u	6312
Loranthaceae	*Amyema congener*	A mistletoe																					e	u	3600
Luzuriagaceae	*Eustrephus latifolius*	Wombat Berry		x			1				2	x	1										v	u	6015
Luzuriagaceae	*Geitonoplesium cymosum*	Scrambling Lily					1						1										v	u	6016
Malvaceae	*Sida rhombifolia**	Paddy's Lucerne																					g	u	3673
Meliaceae	*Synoum glandulosum subsp. glandulosum*	Scentless Rosewood																					t	u	11178

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Menispermaceae	*Sarcopetalum harveyanum*	Pearl Vine																					v	u	3688
Menispermaceae	*Stephania japonica var. discolor*	Snake Vine																					v	u	8428
Menyanthaceae	*Villarsia exaltata*	Yellow Marsh Flower															2	x		x			g	u	3692
Moraceae	*Ficus sp. (Seedling)*	A Fig																					t	u	-
Myrtaceae	*Angophora costata*	Smooth-barked Apple	4	x				x	4	x	2	x		x									t	u	3970
Myrtaceae	*Babingtonia pluriflora*	-									1	x	2										s	u	10678
Myrtaceae	*Callistemon citrinus*	Crimson Bottlebrush																					s	P13	4004
Myrtaceae	*Callistemon pachyphyllus*	Wallum Bottlebrush						x								x			2	x			s	P13	4010
Myrtaceae	*Callistemon pinifolius*	Pine-leaved Bottlebrush											2	x					1	x	1	x	s	P13	4013
Myrtaceae	*Callistemon salignus*	Willow Bottlebrush	2	x	1	x					2	x	2	x									s	P13	4015
Myrtaceae	*Corymbia gummifera*	Red Bloodwood	3	x					3	x	2	x			3	x		x					t	u	9687
Myrtaceae	*Corymbia maculata*	Spotted Gum			5	x																	t	u	9692
Myrtaceae	*Eucalyptus fergusonii subsp. fergusonii*	-			2	x							2										t	3KC	8355
Myrtaceae	*Eucalyptus globoidea*	White Stringybark									3	x											t	u	4097
Myrtaceae	*Eucalyptus microcorys*	Tallowwood					3	x			2	x	5	x									t	u	4128
Myrtaceae	*Eucalyptus paniculata subsp. paniculata*	Grey Ironbark																					t	u	4149
Myrtaceae	*Eucalyptus pilularis*	Blackbutt																					t	u	4155
Myrtaceae	*Eucalyptus canaliculata*	Large-fruited Grey Gum											1										t	u	?
Myrtaceae	*Eucalyptus propinqua*	Small-fruited Grey Gum			2	x																	t	u	4162
Myrtaceae	*Eucalyptus resinifera subsp. resinifera*	Red Mahogany	4	x			4	x										x			4	x	t	u	9793
Myrtaceae	*Eucalyptus robusta*	Swamp Mahogany															4	x					t	u	4171
Myrtaceae	*Eucalyptus signata*	Northern Scribbly Gum																					t	u	4183
Myrtaceae	*Eucalyptus umbra*	Broad-leaved White Mahogany			2	x					3	x											t	u	4196

Family	Scienfic Name	Common Name	Q12	T12	Q13	T13	Q14	T14	Q15	T15	Q16	T16	Q17	T17	Q18	T18	Q19	T19	Q20	T20	Q21	T21	Form	Status	Caps
Myrtaceae	*Leptospermum liversidgei*	-													2	x			3	x	2	x	s	u	4224
Myrtaceae	*Leptospermum polygalifolium subsp. polygalifolium*	Yellow Tea-tree					2	x	1	x	2	x	3	x					4	x	2	x	s	u	8197
Myrtaceae	*Melaleuca ericifolia*	Swamp Paperbark																					s	P13	6391
Myrtaceae	*Melaleuca linariifolia*	Snow-in-Summer	2	x													1	x			2	x	t	u	4257
Myrtaceae	*Melaleuca nodosa*	Ball Honeymyrtle	2	x	1	x			2	x			1		1	x	2	x					s	u	4258
Myrtaceae	*Melaleuca quinquenervia*	Broad-leaved Paperbark		x									2									x	t	u	4260
Myrtaceae	*Melaleuca sieberi*	-	3	x			2	x	1	x					1	x	1	x		x	2	x	s	u	4261
Myrtaceae	*thymifolia*	-					1	x		x					2	x		x	3	x			s	u	4266
Oleaceae	*Notelaea longifolia*	Large Mock-olive																					s	u	4318
Oleaceae	*Notelaea ovata*	-									1	x											s	u	4321
Orchidaceae	*Acianthus fornicatus*	Pixie Caps									2	x											g	u	4353
Orchidaceae	*Cryptostylis Sp. (Leaf only)*	A Tongue Orchid																					g	-	-
Oxalidaceae	*Oxalis corniculata**	Creeping Oxalis					1																g	u	4613
Oxalidaceae	*Oxalis exilis*	Slender xalis									1	x											g	u	4615
Phormiaceae	*Dianella caerulea var. caerulea*	Blue Flax lily			2	x																	g	P13	6700
Phormiaceae	*Dianella caerulea var. producta*	Blue Flax lily	1	x			2	x	1	x	2	x	1	x			2	x			2	x	g	P13	7337
Phylydraceae	*Phylidrum lanuginosum*	Woolly Frogsmouth																	1	x					
Pinaceae	*Pinus elliottii**	Slash Pine					2	x	1	x	1		1	x		x	1						t	u	11138
Pittosporaceae	*Billardiera scandens*	Appleberry			1	x	2	x			2	x	1	x									v	u	4671
Pittosporaceae	*Pittosporum revolutum*	Rough Fruit Pittosporum					1				1	x											s	u	4683
Pittosporaceae	*Pittosporum undulatum*	Sweet Pittosporum									1	x	1										t	u	4685
Poaceae	*Andropogon virginicus**	Whisky Grass	1	x			2	x	4	x					3	x	2	x	2	x	3	x	g	u	4748
Poaceae	*Aristida benthamii*	-																					g	u	4755
Poaceae	*Aristida vagans*	Threeawn Speargrass		x	1	x	2	x															g	u	4773
Poaceae	*Austrodanthonia tenuior*	-																			3	x	g	u	10633
Poaceae	*Austrostipa scabra subsp. scabra*	A Speargrass																					g	u	10378

Family	Scienfic Name	Common Name	Q12	T12	Q13	T13	Q14	T14	Q15	T15	Q16	T16	Q17	T17	Q18	T18	Q19	T19	Q20	T20	Q21	T21	Form	Status	Caps
Poaceae	*Axonopus fissifolius**	Narrow-leaved Carpet Grass		x			2	x		x			2	x	2	x			2	x	2	x	g	u	11194
Poaceae	*Chloris gayana**	Rhodes Grass																		x		x	g	u	4831
Poaceae	*Chloris truncata**	Windmill Grass																					g	u	4833
Poaceae	*Cymbopogon refractus*	Barbed Wire Grass					2	x															g	u	4841
Poaceae	*Cynodon dactylon*	Common Couch					1	x					2	x					2	x		x	g	u	6540
Poaceae	*Dichelachne micrantha*	Shorthair Plumegrass																					g	u	4898
Poaceae	*Digitaria parviflora*	Small-flowered Finger Grass	1	x																x	1	x	g	u	4913
Poaceae	*Digitaria sanguinalis**	Crab Grass																					g	u	6937
Poaceae	*Echinopogon caespitosus var. caespitosus*	Tufted Hedgehog Grass					3	x															g	u	7593
Poaceae	*Echinopogon ovatus*	Forest Hedgehog Grass																					g	u	4934
Poaceae	*Ehrharta erecta**	Panic Veldtgrass																					g	u	4937
Poaceae	*marginata*	Bordered Panic	3	x			2	x	1	x	2	x	2	x			1	x					g	u	4946
Poaceae	*Entolasia stricta*	Wiry Panic	4	x	2	x	2	x	2	x	2	x	2		2	x	2	x	4	x	4	x	g	u	4947
Poaceae	*Eragrostis brownii*	Brown's Lovegrass		x	1	x				x		x									1	x	g	u	7921
Poaceae	*Eragrostis curvula**	Lovegrass																			1	x	g	u	4952
Poaceae	*Eragrostis leptostachya*	Paddock Lovegrass					2	x	1	x			1	x	2	x	2	x	2	x	1	x	g	u	4960
Poaceae	*uncinata*	Matgrass													1		1	x	3	x	2	x	g	u	5001
Poaceae	*Imperata cylindrica var. major*	Blady Grass	2	x	2	x	3	x	2	x	3	x	2	x			3	x			2	x	g	u	8511
Poaceae	*Ischaemum australe var.*	-																					g	u	9278
Poaceae	*Leersia hexandra*	Swamp Ricegrass						x		x							3	x					g	u	5024
Poaceae	*Microlaena stipoides*	-	2	x	3	x	2	x			2	x	1	x	2	x	1	x					g	u	7707
Poaceae	*Oplismenus aemulus*	-																					g	u	5044
Poaceae	*Oplismenus imbecillis*	-																					g	u	5045
Poaceae	*Panicum simile*	Two-colour Panic					1	x	2	x	1	x	1	x	2	x					1	x	g	u	5066

Family	Scienfic Name	Common Name	Q12	T12	Q13	T13	Q14	T14	Q15	T15	Q16	T16	Q17	T17	Q18	T18	Q19	T19	Q20	T20	Q21	T21	Form	Status	Caps
Poaceae	*distans*	-					1	x					1	x		x		x					g	u	7172
Poaceae	*Paspalum dilatatum**	Paspalum					2	x					2	x			1	x	1	x	2	x	g	u	5086
Poaceae	*distichum*	Water Couch																					g	u	5087
Poaceae	*Paspalum orbiculare*	Ditch Millet																					g	u	5089
Poaceae	*Paspalum urvillei**	Vasey Grass						x						x			2	x	2	x	2	x	g	u	5093
Poaceae	*Paspalum wettsteinii**	Broad-leaved Paspalum												x									g	u	8715
Poaceae	*Pennisetum alopecuroides**	Swamp Foxtail																					g	u	5094
Poaceae	*Pennisetum clandestinum**	Kikuyu Grass												x									g	u	5096
Poaceae	*Setaria pumila**	Pale Pigeon Grass					1	x		x			2	x					1	x			g	u	7842
Poaceae	*Sporobolus creber*	Slender Rat's Tail Grass																					g	u	5179
Poaceae	*Stenotaphrum secundatum**	Buffalo Grass												x									g	u	5185
Poaceae	*Themeda australis*	Kangaroo Grass	1	x	2	x	2	x	1		2	x	2	x				x			1	x	g	u	5219
Polygonaceae	*decipiens*	Knotweed																					w	u	7568
Polygonaceae	*Rumex bidens*	Mud Dock																	1	x					
Portulacaceae	*Portulaca oleracea*	Purslane																	2	x					
Proteaceae	*Banksia oblongifolia*	Fern-leaved Banksia																					s	P13	5345
Proteaceae	*Banksia serrata*	Old-man Banksia																					t	u	5348
Proteaceae	*Banksia spinulosa var. spinulosa*	-	1	x			1																s	P13	7488
Proteaceae	*Lomatia silaifolia*	Crinkle Bush									2	x											g	P13	5445
Proteaceae	*Persoonia lanceolata*	Lance Leaf Geebung															1	x					s	P13	5460
Proteaceae	*Persoonia levis*	Broad-leaved Geebung									1	x				x		x					s	P13	5462
Proteaceae	*Persoonia linearis*	Narrow-leaved Geebung			1	x					2	x											s	P13	5463
Ranunculaceae	*Clematis aristata*	Old Man's Beard																					v	u	5493
Restionaceae	*Baloskion tetraphyllum subsp. meiostachyum*	-							3	x					3	x	2	x					g	u	10614
Restionaceae	*Empodisma minus*	Spreading Rope-rush	2	x			1	x	1	x					2	x							g	u	5532
Restionaceae	*Leptocarpus tenax*	-								x							2	x					g	u	5534

Family	Scienfic Name	Common Name	Q12	T12	Q13	T13	Q14	T14	Q15	T15	Q16	T16	Q17	T17	Q18	T18	Q19	T19	Q20	T20	Q21	T21	Form	Status	Caps
Restionaceae	*Lepyrodia muelleri*	Scale Rush																					g	u	5540
Restionaceae	*Lepyrodia scariosa*	Scale Rush																	3	x	4	x	g	u	5541
Rubiaceae	*propinquum*	Maori Bedstraw									1	x											g	u	5688
Rubiaceae	*diphylla*	-		x			1	x			2	x											g	u	5698
Rubiaceae	*Opercularia varia*	Variable Stinkweed													2	x	2	x					g	u	5701
Rubiaceae	*Pomax umbellata*	Pomax							2	x				x	2	x							g	u	5703
Rutaceae	*Boronia pinnata*	-													1	x							g	P13	5750
Rutaceae	*squamea subsp. squamea*	Satinwood																					s	u	10742
Rutaceae	*Zieria smithii*	Sandfly Zieria																					s	u	5847
Santalaceae	*Leptomeria acida*	Sour Currant Bush			1	x									1	x							s	u	5865
Sapindaceae	*Dodonaea triquetra*	Large-leaf Hop-bush																					s	u	5911
Scrophulariaceae	*Veronica plebeia*	Trailing Speedwell																					g	u	6009
Selaginellaceae	*Selaginella uliginosa*	Swamp Selaginella							3	x					3	x	3	x				x	g	u	8187
Smilacaceae	*Smilax australis*	Lawyer Vine																					v	u	7592
Smilacaceae	*Smilax glyciphylla*	Sweet Sarsparilla								x	2	x	1				1	x					v	u	6022
Solanaceae	*Solanum mauritianum**	Wild Tobacco Bush																					s	u	6090
Solanaceae	*Solanum nigrum**	Black-berry Nightshade																					g	u	6091
Stylidiaceae	*Stylidium graminifolium*	Grass Triggerplant														x							g	u	6157
Thymelaeaceae	*Pimelea linifolia subsp. linifolia*	Slender Rice-flower			1	x	1	x													3	x	g	u	6814
Verbenaceae	*Lantana camara**	Lantana									1												s	u	6248
Verbenaceae	*Verbena bonariensis**	Purpletop																					g	u	6256
Violaceae	*Hybanthus monopetalus*	Slender Violet-bush				x					1	x											g	u	6266
Violaceae	*Viola banksii*	-																					g	u	11863
Vitaceae	*clematidea*	Slender Grape																					v	u	6281
Xanthorrhoeaceae	*Xanthorrhoea fulva*	Swamp Grasstree							1	x			1		1	x							g	u	8771
Xanthorrhoeaceae	*Xanthorrhoea latifolia subsp. latifolia*	-																	3	x			g	u	9309
Xanthorrhoeaceae	*Xanthorrhoea macronema*	-									2	x											g	P13	6318
Xyridaceae	*Xyris complanata*	-							1						1	x	2	x					g	u	7247
Zamiaceae	*Macrozamia communis*	Burrawang																					s	P13	6327

APPENDIX 2

HOLLOW BEARING TREE SURVEY

HOLLOW BEARING TREE SURVEY

CLIENT. Crightons Property Group.....REF NO.8020.....SURVEY DATE.2008.....

SHEET NO.....1.....of.....4.....TREE LOCATIONS SHOWN ON FIGURE 1 SITE SURVEY SHEET COMPLETED Y/N ASSESSOR P.S……..

Tree Tag Number		HT 01	HT 02	HT 03	HT 04	HT 05	HT 06	HT 07	HT 08	HT 09	HT 10	HT 11	HT 12	HT 13
Species		*E. pilularis*	*E. robusta*	*E. robusta*	*E. pilularis*	*E. pilularis*	*C.*	*E.*	*E. fibrosa*	*E. fibrosa*	*E.*	*E.*	*E. robusta*	*E. robusta*
DBH (cm)		50, 90,	40, 60	120	200	45	60, 30	40	35	35	40, 25	35	35, 30	50, 90,
Spread (m)		30	12	12	30	20	15	15	9	7	8	10	6	6
Height (m)		22	15	18	25	30	20	18	12	12	12	15	15	15
Position														
% Health		90	70	60	75	50	80	75	40	30	30	75	40	40
Fauna Use								feral bees				Trunk-		
HOLLOWS														
	S													
I Broken Trunk	M			1					1	1		1	1	
	L													
	S													
II Branch	M	1					1				1			1
	L				1									
	S		1		1	2								
III Trunk	M					1								
	L					2								
	S													
IV Splits	M							1						
	L													
	S													
V Cracked Bark	M													
	L													
Targeted fauna survey														

SIZE OF HOLLOWS: S = < 10cm, M = 10 to 30cm, L = > 30cm
HEALTH: Record % of healthy growth compared to dead limbs.

POSITIONS: Topographical location - ridge, slope, gully etc.
FAUNA USE: Record scats, scratches, feed scars, nests etc.

HOLLOW BEARING TREE ASSESSMENT

CLIENT. Crightons Property Group.....REF NO.8020..... SURVEY DATE.2008.....

SHEET NO.....2.....of.....4.....TREE LOCATIONS SHOWN ON FIGURE 1 SITE SURVEY SHEET COMPLETED Y/N ASSESSOR P.S……..

Tree Tag Number		HT 14	HT 15	HT 16	HT 17	HT 18	HT 19	HT 20	HT 21	HT 22	HT 23	HT 24	HT 25	HT 26
Species		*E. robusta*	*E. pilularis*	*A. costata*	*stag*	*stag*	*E. robusta*	*E. robusta*	*E. robusta*	*E. robusta*	*A. costata*	*E. robusta*	*A. costata*	*E. robusta*
DBH (cm)		50	20, 25	30, 20	40	30		40	40,30, 30	50	30 , 20	45	30, 50	50
Spread (m)		13	2	6	4	2	4	5	6	10	8	4	15	12
Height (m)		15	8	10	1	12	15	15	12	17	18	15	12	15
Position														
% Health		70	10	40			60	65	60	75	75	60	60	75
Fauna Use														
HOLLOWS														
	S	1												
I Broken Trunk	M			1								1	1	1
	L									1	1			
	S													
II Branch	M		1				1	1						
	L													
	S			1	2	1	2		1					
III Trunk	M				1		1							
	L													
	S				2	1								
IV Splits	M							1	1					
	L													
	S													
V Cracked Bark	M			1	2	2								
	L													
Targeted fauna survey														

SIZE OF HOLLOWS: S = < 10cm, M = 10 to 30cm, L = > 30cm
HEALTH: Record % of healthy growth compared to dead limbs.

POSITIONS: Topographical location - ridge, slope, gully etc.
FAUNA USE: Record scats, scratches, feed scars, nests etc.

HOLLOW BEARING TREE ASSESSMENT

CLIENT. Crightons Property Group.....REF NO.8020..... SURVEY DATE.2008.....

SHEET NO.....3.....of.....4.....TREE LOCATIONS SHOWN IN FIGURE 1 SITE SURVEY SHEET COMPLETED Y/N ASSESSOR. P.S……..

Tree Tag Number		HT 27	HT 28	HT 29	HT 30	HT 31	HT 32	HT 33	HT 34	HT 35	HT 36	HT 37	HT 38	HT 39
Species		*A. costata*	*A. costata*	*A. costata*	*E. robusta*	*A. costata*	*C.*	*E.*	*E.*	*E. robusta*	*E. robusta*	*E. robusta*	*E. robusta*	*E. robusta*
DBH (cm)		30	40, 40	45, 20	50,40, 30,	40, 40	30, 25	50	40	50	50	50	40 , 10	35, 10, 5
Spread (m)		5	14	12	9	14	6	14	6	5	9	7	4	3
Height (m)		12	14	14	14	17	12	16	14	15	12	12	10	10
Position														
% Health		5	75	80	60	80	50	60	60	70	80	50	50	30
Fauna Use			scratches										scratches	
HOLLOWS														
	S													
I Broken Trunk	M							1			1			
	L									1			1	1
	S		1	1	2									
II Branch	M	1				1			1					
	L													
	S													
III Trunk	M													
	L													
	S													
IV Splits	M													
	L						1					1		
	S													
V Cracked Bark	M													
	L													
Targeted fauna survey														

SIZE OF HOLLOWS: S = < 10cm, M = 10 to 30cm, L = > 30cm
HEALTH: Record % of healthy growth compared to dead limbs.

POSITIONS: Topographical location - ridge, slope, gully etc.
FAUNA USE: Record scats, scratches, feed scars, nests etc.

HOLLOW BEARING TREE ASSESSMENT

CLIENT. Crightons Property Group.....REF NO.8020..... SURVEY DATE.2008.....

SHEET NO.....4.....of.....4.....TREE LOCATIONS SHOWN ON FIGURE 1 SITE SURVEY SHEET COMPLETED Y/N ASSESSOR P.S……..

Tree Tag Number		HT 40	HT 41	HT 42	HT 43	HT 44	HT 45	HT 46	HT 47	HT 48				
Species		*E. robusta*	*E. robusta*	*E. robusta*	*E. robusta*	*E. robusta*	*E. robusta*	*E. pilularis*	*E. robusta*	*E.*				
DBH (cm)		25	50	25, 10	30	25, 10,40	35	60, 25	50	60				
Spread (m)		2	5	2	5	6	2	8	7	7				
Height (m)		5	8	8	7	12	8	12	12	8				
Position		20	60	60	50	50	10	20	60	60				
% Health														
Fauna Use														
HOLLOWS														
	S							1						
I Broken Trunk	M	1		1			1	1		1				
	L		1											
	S													
II Branch	M				1	1								
	L									1				
	S								1					
III Trunk	M													
	L													
	S													
IV Splits	M													
	L						1		1					
	S													
V Cracked Bark	M													
	L													
Targeted fauna survey														

SIZE OF HOLLOWS: S = < 10cm, M = 10 to 30cm, L = > 30cm
HEALTH: Record % of healthy growth compared to dead limbs.

POSITIONS: Topographical location - ridge, slope, gully etc.
FAUNA USE: Record scats, scratches, feed scars, nests etc.

Original plan produced in A3 colour.

*Subject Site boundary subject to final survey. Plan for indicative purposes only. Not for detailed measurement. Survey locations are approximate and have not been fixed by land survey.

Legend

- Subject Site Boundary
- Surveyed Hollow Bearing Tree Location
- Approximate Identified Hollow Bearing Tree Location

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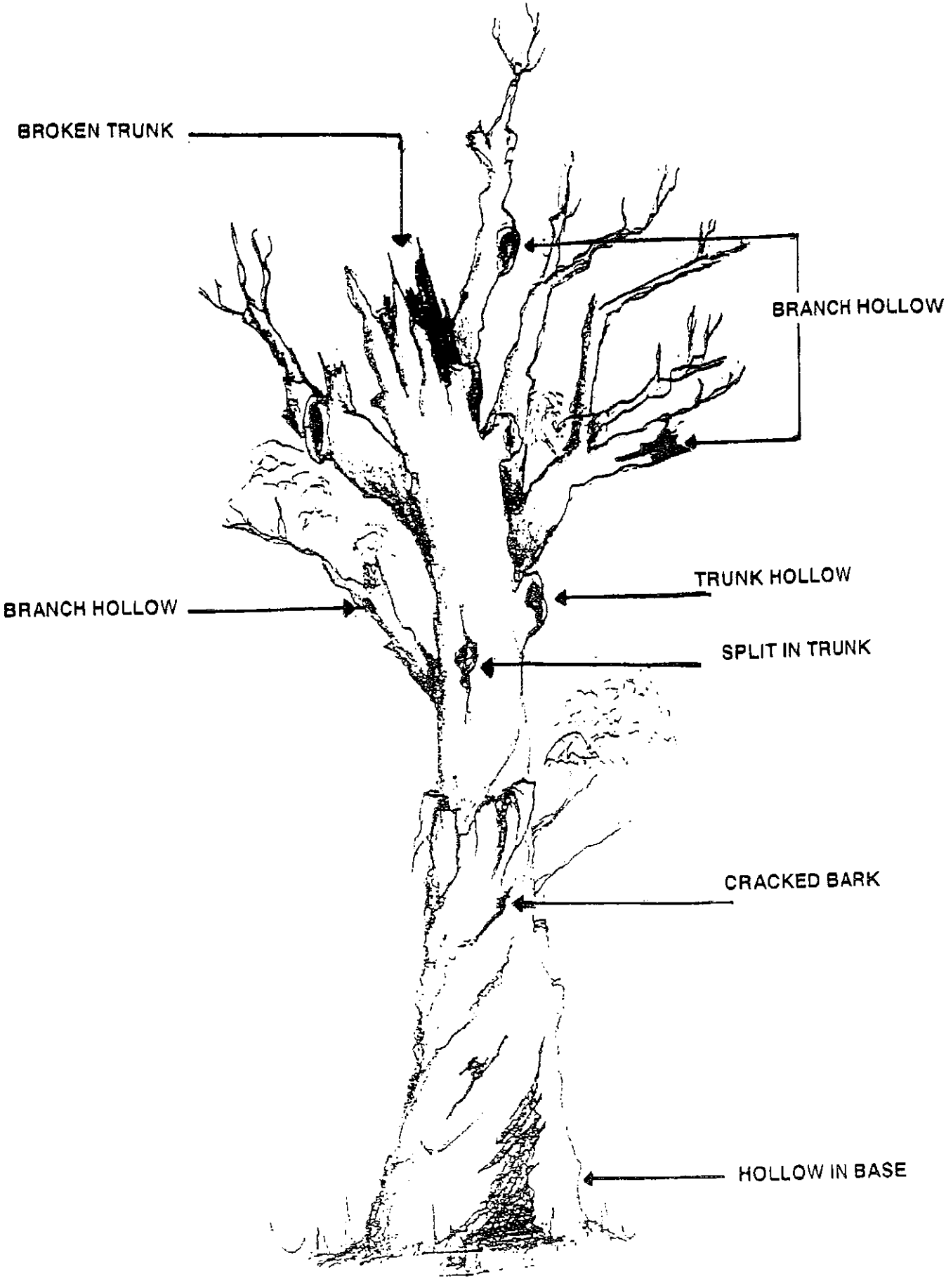
Figure A2.1
Hollow Bearing Tree Locations
Riverside, Tea Gardens

Ver.FX By JM 12/08/08 Ref.No.8020

Source: Surveyed hollow bearing tree location details supplied by Tattersals surveyors 2008.

TYPES OF TREE HOLLOWS TO BE RECORDED ON HABITAT TREE SURVEY



APPENDIX 3

KOALA MANAGEMENT STRATEGY

KOALA MANAGEMENT STRATEGY

RIVERSIDE
TEA GARDENS

AUGUST 2008
(REF: 8020)

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KOALA MANAGEMENT STRATEGY

RIVERSIDE
TEA GARDENS

AUGUST 2008

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PREFACE

This Koala Management Strategy has been prepared to identify and address issues and actions relevant to the protection of Koalas and their habitat within land known herein as Riverside at Tea Gardens. This report has been prepared to accompany an Environmental Assessment to be submitted as part of a development application for the subject site. The Environmental Assessment has been prepared in accordance with the Director Generals Environmental Assessment Requirements (DGEAR's). These DGEARs have been provided in accordance with Part 3A Major Infrastructure and Other Projects of the *Environmental Planning and Assessment Act* (1979).

This report details the assessment of the site in relation to the occurrence of Koala habitat within the site and the Koala within the local area. This report also considers those recovery objectives of the Recovery Plan for the Hawks Nest and Tea Gardens Endangered Koala (*Phascolarctos cinereus*) Population and Draft Recovery Plan for the Koala (*Phascolarctos cinereus*).

As the Koala or evidence of its use of the site was not observed during surveys a Koala Plan of Management in accordance with State Environmental Planning Policy (SEPP) No. 44 Koala Habitat Protection is not required. Additionally, the preparation of a Koala Plan of Management in accordance with SEPP 44 is not part of the planning framework required to be considered within Part 3A Major Projects applications and within the Director Generals Environmental Assessment Requirements for the Concept Plan. However, this Koala Management Strategy has been prepared as a proactive measure in response to the occurrence of potential habitat within the site and known presence of the Koala within the Tea Gardens and Hawks Nest area and also to make contingency for the future potential use of the site and long term protection of this species.

TABLE OF CONTENTS

KOALA MANAGEMENT STRATEGY

SECTION 1

INTRODUCTION

This Koala Management Strategy has been prepared to identify and address issues and actions relevant to the protection of Koalas and their habitat within land known herein as Riverside at Tea Gardens. This report has been prepared to accompany an Environmental Assessment to be submitted as part of a development application for the subject site. The Environmental Assessment has been prepared in accordance with the Director Generals Environmental Assessment Requirements (DGEAR's). These DGEARs have been provided in accordance with Part 3A Major Infrastructure and Other Projects of the *Environmental Planning and Assessment Act* (1979).

For the purposes of this Koala Management Strategy the subject site refers to the area proposed for development within Lots 10 and 34 DP 270100 known herein as Riverside. This includes those areas to be developed for commercial and residential mixed use and those areas to be retained as part of reserve and corridor areas. These areas include land within SEPP 14 wetlands, conservation zoned land, Asset Protection Zone and buffer areas, drainage corridors and wildlife corridors.

1.1 Background

The subject site is within the area bound by the Hawks Nest and Tea Gardens Endangered Koala (*Phascolarctos cinereus*) Population. The area containing the endangered population extends in the south-east to Yacaaba Headland and in the south-west to the peninsula west of Winda Woppa. The population area extends in the west and north-west to the outskirts of the builtup area of Tea Gardens, including the Shearwater Estate, where it is bound by Toonang Drive at the northern boundary of the subject site. The population area extends in the north to an east-west line three kilometres north of the boundary of the Hawks Nest Golf Course. Occasional sightings have been made outside these boundaries. The population is bound in the south and east by the Pacific Ocean (NSW Scientific Committee 2000).

The Koala or signs of its presence were not observed within the subject site during surveys. Extensive fauna surveys and Spot Assessments Techniques were employed within the site however no signs of the presence of the Koala within the site were observed during these surveys. Full details of the surveys for the Koala are contained within Section 1.2.

As the Koala or evidence of its use of the site was not observed during surveys a Koala Plan of Management in accordance with State Environmental Planning Policy No. 44 Koala Habitat Protection is not required. However, this Koala Management Strategy has been prepared due to the known presence of the Koala within the Tea Gardens and Hawks Nest area and to provide environmental management strategies for the future potential use of the site and long term protection of this species. The Hawks Nest and Tea Gardens population of the Koala has been listed as endangered within the *Threatened Species Conservation Act* (1995).

The works and measures detailed within this report in relation to Koala Habitat Management are to be carried out in conjunction with those strategies developed for the Ecological Site Management Strategy (CEG 2008) and Bushfire Protection Assessment (CEG 2008).

1.2 Koala Habitat Assessment

The subject area was assessed for activity by Koalas using the following methods:

vii. A search of the Atlas of NSW Wildlife (DECC 2008, Bionet 2008) was undertaken to identify records of koalas located within 10km of the site.

viii. Review of previous flora and fauna surveys and SEPP 44 assessments undertaken across the site and within the local area.

ix. The site was surveyed on foot with all Koala food trees being inspected for signs of Koala usage. Trees were inspected and identified for presence of Koalas, scratch and claw marks on the trunk and scats around the base of each tree. The proportion of trees showing signs of Koala use was calculated for each transect. Additionally the location and density of droppings if found was documented.

x. Koalas were also targeted during spotlight surveys.

xi. Identification and an assessment of the density of tree species listed as Koala feed trees in State Environmental Protection Policy No. 44 - Koala Habitat Protection was undertaken across the site.

xii. Trees were searched for signs of Koala usage on March 2007 using methodology outlined in the Spot Assessment Technique (Phillips and Callaghan, 1995). No Koala usage of the subject site was observed.

xiii. Spotlighting for the Koala was carried out during 25-26 February, 15 August and 6 & 7 September 2007 and February, March & April 2008.

Parts of the subject site were found to contain *Eucalyptus robusta* (Swamp Mahogany), *Eucalyptus signata* (Scribbly Gum), *Eucalyptus microcorys* (Tallowwood) and *Eucalyptus punctata* (Grey Gum) all identified Koala food tree species listed on Schedule 2 of the State Environmental Planning Policy No. 44 - Koala Habitat Protection. The balance of the trees on the subject site are predominantly *Angophora costata* (Smooth-barked Apple), *Corymbia gummifera* (Red Bloodwood), *Eucalyptus umbra* (Broad-leafed White Mahogany), *Endiandra sieberi* (Corkwood) and *Melaleuca quinquenervia* (Broad-leaved Paperbark). Areas of the subject site contain preferred Koala food trees in densities greater than 15% thus there are occurrences of Potential Koala Habitat within the site.

No Koala or signs of evidence were observed during surveys and Spot Assessments. Further Spot Assessments were completed in 2007. Fourteen census points were sampled. At each of these points 20 trees were inspected for signs of Koala usage, that is, scats at the base or tell tale scratches on the trunk. No evidence of any use of the site by the Koala was observed during these surveys. Locations of Spot Assessments undertaken in 2007 are shown in Figure A3.1.

Records of the Koala within the site consist of a single observation from 1995 (DECC 2008). There are no recent records for this species on the subject site within the Atlas of NSW Wildlife (DECC 2008). There are records for the Koala from recent surveys within land to the north-west of the site that have apparently yielded significant activity levels (*M. Bell pers. comm*.)

The absence of Koalas on the site either as regularly occurring individuals or a breeding colony would indicate that the site provides Potential Koala Habitat but does not form Core Koala Habitat as per the guidelines and definitions set out within SEPP 44.

1.3 Legislative Framework

This Koala Management Strategy has been prepared to identify and address issues and actions relevant to the protection of Koalas and their habitat within Riverside at Tea Gardens. This report has been prepared to accompany an Environmental Assessment to be submitted as part of a development application for the subject site. The Environmental Assessment has been prepared in accordance with the Director Generals Environmental Assessment Requirements (DGEAR's). These DGEARs have been provided in accordance with Part 3A Major Infrastructure and Other Projects of the *Environmental Planning and Assessment Act* (1979).

State Environmental Planning Policy No. 44 Koala Habitat Protection provides a legislative framework for the identification of Koala habitat and implementation of management strategies to protect Koala habitat. Where Core Koala Habitat is identified within an area, SEPP 44 requires a Koala Plan of Management to control and minimise impacts upon Koala habitat. No Core Koala Habitat was identified within the site however as detailed within Section 1.2. As such a Koala Plan of Management in accordance with SEPP 44 is not required.

A Recovery Plan for the Hawks Nest Tea Gardens Endangered Koala Population has been prepared by the NSW *National Parks and Wildlife Service* (2003). The Recovery Plan contains broad objectives and actions to be implemented by the *Department of Environment and Climate Change* and *Great Lakes Council* with the objective of returning the endangered population to a position of viability in nature. The Recovery Plan establishes a framework for ongoing protection and rehabilitation through on-ground works and further planning.

This Koala Management Strategy has been developed due to the known presence of the Koala within the Tea Gardens and Hawks Nest area and to make contingency for the future potential use of the site by this species. Where appropriate this Koala Management Strategy includes details to be consistent with the broader objectives and actions of the Recovery Plan for the Hawks Nest Tea Gardens Endangered Koala Population.

1.4 Proposed Development

The proposed development is for a mixed use commercial and residential development according to the Concept Masterplan provided as separate documentation.

1.5 Site Description

The subject site is bound to the north by bushland, rural residential land and Toonang Drive, to the east by the Mile River, to the south by residential land within the Shearwater Estate and to the west by fragmented bushland and industrial estate development west of Myall Street.