Our Ref: A12045:JT/CM

11 May 2012

Hapido Pty Ltd and TSM Projects Pty Ltd
PO Box 239
WOY WOY NSW 2256

Attention: Mr Terry Moran

Dear Terry,

Re: Updated Fauna Survey
Lot 23 DP 1159704 - 76 Berkeley Road, Fountaindale

Travers bushfire & ecology has undertaken updated fauna survey at the above address in response to Council correspondence which sought more information`.

In particular Council sought advice in relation to the following queries (shown in italics). Each query has been addressed by this firm.

In the course of responding to this request we have decided it is reasonable to provide the survey results from projects undertaken for other clients in the immediate area. In that light we have undertaken extensive survey between 2001 and 2012 (see Attachment 2 Figure 5).

Council matter – Powerful Owl

"(due to a powerful owl observed roosting on the site) a report from an owl specialist to confirm that there is no powerful owl nesting tree within 200m of the proposed dwelling envelopes, or a detailed hollow bearing tree assessment for the entire site that will either identify the nesting tree or confirm it is not on site. I'm prepared to accept these reports after the proposal is submitted to the gateway however it may be wise to confirm the location of the tree now as if it is within 200m of the dwelling envelopes then the rezoning proposal may fail".

Response by *Travers bushfire & ecology*

Powerful Owl surveys within the Site

- Powerful Owl had not been recorded during surveys of the subject site undertaken in 2001, 2009 & 2010 by *Conacher Travers* or *Travers bushfire & ecology*.
- Powerful Owl was observed roosting within the subject site on the 19th May 2011 (see Figures 3 & 4 - Attachment 2) by *Travers bushfire & ecology*. The observation prompted additional fauna survey for nesting activity. No further owl presence was observed.

Powerful Owl Surveys off site

- Powerful Owl was recorded by *Travers bushfire & ecology* responding to call-playback during surveys undertaken adjacent to Bottlebrush Drive, Glenning Valley in 16th March 2009 (see Figure 4).

ABN 64 083 086 677
PO Box 7138
Kariong NSW 2250

38A The Avenue
Mt Penang Parklands
Central Coast Highway
Kariong NSW 2250

t: 02 4340 5331
f: 02 4340 2151
e: info@traversecology.com.au

- *Travers bushfire & ecology* recorded Powerful Owl (by response to call-playback) on the 12th January 2012 during survey along the northern extent of Berkeley Road, approximately 400m north of the subject site (see Figure 4).

In 2010 *John Young Wildlife* were engaged to determine the extent of a known resident Powerful Owl in relation to the possible impact upon that species (pair) from a proposed rezoning at Glenning Valley. JYW concluded that nesting activity was more likely occurring over the ridge to the west in the same valley as Pleasant Valley Road.

Survey undertaken in April 2012

Travers bushfire & ecology fauna specialist Corey Meade undertook searches for suitable Powerful Owl nesting locations and signs of roosting activity within 200m of the proposed dwelling envelope locations on the 24th April 2012.

An image indicating a 200m polygon was uploaded onto a GPS to assist filed accuracy of the 200m radius.

Due to the density of vegetation in some forest areas the search transect was also collected on the GPS so that the area could be efficiently covered with little overlap (see Figure 4 for search area and GPS search transect).

Where possible transects were run parallel so trees could be observed from both directions. As some Swamp Mahogany (*Eucalyptus robusta*) trees were present within the Swamp Sclerophyll Forest to the north, this area was searched also.

Searches were then undertaken in open forest areas containing large eucalypts towards the north in the direction of where the species responded to call playback in January 2012 (see Figure 4 in Attachment 2). Previously identified suitable large hollows on neighbouring lands to the east were also revisited for signs of activity (see Figure 4).

Following diurnal searches nocturnal survey was undertaken. No call-playback was used to prevent disturbance of breeding activity. Eight listening points were selected through the subject site and surrounding locality to listen for calling owls (see Figure 4).

The first listening point was undertaken during the dusk and early dark period. This was at the location where an individual was observed roosting within the site on the 19th May 2011. The remaining six listening points are shown on Figure 4.

Periodic spotlighting was undertaken at the end of listening but this was limited to prevent disturbance. Note: Powerful Owls call relatively regularly during this early breeding time of year, particularly after dusk and just before dawn.

Results

Two (2) trees were identified as being suitable for Powerful Owl nesting within 200m of envelopes (see Figure 4). These trees were considered of low and moderate suitability. One other tree, located just outside of the 200m search area to the south, was considered highly suitable. Notwithstanding this potential none of these three trees showed any evidence of nearby roosting activity indicating breeding activity.

Whitewash indicating an owl roost was located in the south-western portions of the search area. An owl pellet was also found at this location. This pellet contained a high content of

beetle remains which confirmed the pellet and white wash belong to the Southern Boobook (*Ninox novaeseelandiae*).

No other owl activity was recorded within the remaining search areas.

Comment

The survey was based on a 200m radius of the proposed dwellings sites. In addition further areas were surveyed (see Figure 4) which provided a more extensive search for suitable Powerful Owl nest trees.

Given the large areas surveyed it was thought larger trees and trees with large hollows would be expected to occur more frequently, but these were rarely encountered. This is most likely the result of previous logging in the area.

Given the findings from most recent surveys undertaken to determine presence / absence of Powerful Owl, the likelihood of this species nesting in the Pleasant Valley Road area (as per JYW advice 2010) is supported.

Council matter *– updated amphibian, reptile and microbat surveys carried out during the appropriate season.*

Response by *Travers bushfire & ecology*

Updated nocturnal opportunistic amphibian, diurnal opportunistic reptile and microbat survey was undertaken. The table in Attachment 1 provides all survey effort and weather conditions associated with the subject site to date. Recent 2012 survey effort is indicated.

Surveys have now been undertaken in September 2001, July 2007, November 2007, June 2010 and April 2012.

Updated survey recorded in 2012 recorded only non-threatened amphibians including Jervis Bay Tree Frog (*Litoria jervisiensis*), Peron's Tree Frog (*Litoria peroni*), Whistling Tree Frog (*Litoria Vereauxii*) and Common Eastern Froglet (*Crinia signifera*).

No records have been provided to the *Atlas of NSW Wildlife* since 2007 for Wallum Froglet and or Green-thighed Frog. These species have also not been detected during any survey undertaken between 2001 and 2012 by this firm. Therefore the possibility the site containing the two threatened frog species namely Wallum Froglet and Green-thighed Frog is not likely.

The subject site offers no typical breeding habitat for the Wallum Froglet however there is some potential for dispersal into the site from recorded breeding habitat in the locality to the north in the SEPP 14 wetland. The Green-thighed Frog is difficult to detect as it, generally, only calls one or two nights in the year following heavy summer rainfall.

Given that riparian zones, including the buffers, have been retained (see Attachment 3) there is ample landscape for these two species to disperse. Along with the extensive habitat occurring to the north and its linkage to the SEPP 14 wetland and ephemeral swamp forest there is significant habitat for Wallum Froglet and Green-thighed Frog for both breeding and dispersal such that neither of these species is likely to be affected by the proposed development including its asset protection zones if they should enter this ecosystem at some time in the future.

Reptiles

Updated survey in 2012 recorded only one non-threatened reptile the Delicate Skink (*Lampropholis delicata*). There is also unlikely presence of only two threatened reptile species including Pale-headed Snake and Stephen's Banded Snake.

The updated survey is not in the appropriate peak season for nocturnal activity by these species. Neither of these species will be likely affected by the proposed development in existing cleared areas.

Microbats

An additional microbat survey was carried out in 2012. The threatened Little Bentwing-bat and the Eastern Bentwing-bat were recorded. Both of these species were recorded during previous site surveys.

Non-threatened microbat species recorded included Eastern Forest Bat (*Vespadelus pumilus*), Chocolate Wattled Bat (*Chalinolobus morio*), Eastern Horseshoe Bat (*Rhinolophus megaphyllus*), Eastern Freetail Bat (*Mormopterus ridei*) and a Long-eared Bat (*Nyctophilus* sp.).

The survey was undertaken outside of 'peak' months for microbat activity. No new threatened microbat species were recorded. The hollow-dependent Greater Broad-nosed Bat has been recorded during previous surveys within the subject site and other hollow dependent microbats have potential to occur. Despite this there will be no hollow removal as part of the proposal and foraging pathways along forest edges will remain consistent.

Gliders

The threatened Yellow-bellied Glider (Petaurus australis) and Grey-headed Flying-fox (Pteropus poliocephalus) were recorded again during nocturnal surveys.

These were heard up the hill to the south of the southern lot where Yellow-bellied Glider has been heard previously. The Grey-head Flying-fox was also heard foraging in the surrounding locality particularly to the west.

***Council matter** – add to figure 3 for the location of threatened species the date of each record*

Response by *Travers bushfire & ecology*

Figure 3 shows the year and season for each record in the legend. These are colour coded differently so the recorded year on the aerial can be determined.

Updated fauna survey effort and threatened species records from recent 2012 surveys have been included on this figure and provided in Attachment 2.

***Council matter** show riparian corridors in accordance with Office of Water Guidelines for Riparian corridors and justify any variations*

Response by *Travers bushfire & ecology*

One riparian corridor is located on survey plans prepared by *Everitt & Everitt* (2008). We have added a second watercourse to those plans west of Lot 3 (see Attachment 3) which is

mapped as part of a stream on the Wyong 1:25000 topographic map. These watercourse locations are supported by commentary in the flood plan by *Hoolihan Partners Pty Ltd (2012).*

The watercourses are Category 3 riparian corridors as classified by the *Office of Water Guidelines* and they therefore require a 10m core riparian zone and no additional vegetated buffer. The watercourses and their core riparian zones (buffers) have been drawn over the survey plan in Attachment 3.

A minor overland flow path (see photo 1) is also located centrally within Lot 3 but this is not regarded as a watercourse in accordance with the *Water Management (General) Regulation (2011).*

Photo 1 –Picture of the minor overland flow path

In accordance with the definitions contained in the *Water Management (General) Regulation (2011)* a minor stream means:

(a) any stream or part of a stream:
(i) the location of which is represented on any of the topographic maps listed in Part 2 of Schedule 2, and
(ii) that is a first or second order stream, or part of such a stream, as determined in accordance with the system set out in Part 1 of Schedule 2, and
(iii) which does not maintain a permanent flow of water, being a visible flow which occurs on a continuous basis, or which would so occur if there were no artificial abstractions of water or obstruction of flows upstream, and

(iv) which does not at any time carry flows emanating from a third, fourth or higher order stream as determined in accordance with the system set out in Part 1 of Schedule 2, and

(b) any stream or part of a stream the location of which is not represented on a topographic map listed in Part 2 of Schedule 2.

For the purposes of paragraphs (a) (i) and (ii) of the *Water Management (General) Regulation (2011),* the 'streams' are mapped on the topographic maps according to the legend.

The identified overland flow path is not mapped on the topographic map (Wyong 91312N) as a stream and is not mapped as a first or second order stream. The overland flow path fails classification as a minor stream under clause (a)(i) & (ii). The overland flow path does not have a defined channel for the passage of water with no evidence of bank formation. It is therefore not classed as a minor stream or watercourse of any nature. A similar situation can occur with any deformity in the landscape in that it can direct or deflect overland flow but this in itself is not a cause to determine it as being a stream or a watercourse with a 'bed and bank'.

I hope the above information resolves the matters of concern however should you have any queries or require further information, please do not hesitate to contact me.

Yours faithfully,

John Travers
Managing Director
Travers bushfire & ecology

Attachment 1:

FAUNA SURVEY EFFORT

Fauna group	Date	Weather conditions	Survey method	Survey effort / time (24hr)
Diurnal birds	17/09/01	Fine 21°C,2/8 cloud no rain, wind 5kmph	Bird census, Opportunistic observation	1hr 3.00-4.00pm
	18/09/01	Fine 21°C,0/8 cloud no rain, wind 5kmph	Bird census, Opportunistic observation	1hr 8.00-9.00am
	19/09/01	Fine 20°C,7/8 cloud no rain, wind 5kmph	Bird census, Opportunistic observation	1hr 8.00-9.00am
	20/09/01	Fine 19°C,0/8 cloud no rain, wind 5kmph	Bird census, Opportunistic observation	1hr 8.00-9.00am
	09/07/07	8/8 cloud, light SE wind, showers, 15°C	Opportunistic observation	4hrs 13:50 - 17:50
	10/07/07	0/8 cloud, light W wind, no rain, 12-16°C	Opportunistic observation	2hrs 15min 8:30 – 10:45
	11/07/07	0/8 cloud, no wind, no rain, 13-18°C	Opportunistic observation	2hrs 30min 8:35 – 11:05
	12/07/07	0/8 cloud, no wind, no rain, 9-14°C	Opportunistic observation	2hrs 20min 8:35 – 10:55
	13/07/07	0/8 cloud, no wind, no rain, 9.5-18°C	Opportunistic observation	2hrs 25min 8:40 – 11:05
	20/11/07	0/8 cloud, light NE wind, no rain, 26°C	Bird census, Opportunistic observation	2hrs 18:00 – 20:00
	21/11/07	8/8 cloud, Nil wind, nil, 24°C	Bird census, Opportunistic observation	1hrs 40min 18:20 – 20:00
	29/06/10	0/8 cloud, no wind, no rain, temp 13°C	Diurnal opportunistic	3hrs 25mins 1350 - 1715
Nocturnal birds	19/09/01	Fine 18°C,0/8 cloud, no rain, 5kmph wind	Spotlighting, Owl Call Playback	1hour 6.00pm-7.00pm.
	20/09/01	Fine 17° C, 5/8 cloud, no rain, no wind	Spotlighting, Owl Call Playback	1hour 6.00pm-7.00pm
	10/07/07	2/8 cloud, no wind, no rain, 10°C	Spotlighting, Owl Call Playback	2hrs 30min 17:30 – 20:00
	12/07/07	0/8 cloud, no wind, no rain, 10°C	Spotlighting, Owl Call Playback	3hrs 17:45 – 20:45
	20/11/07	0/8 cloud, light NE wind, no rain, 20°C	Owl and Bush Stone-Curlew Call Playback	40min 20:20 – 21:00
	21/11/07	8/8 cloud, Nil wind, nil (storm @ 21:00), 17°C	Owl Call Playback	45min 20:15 – 21:00
	17/06/10	0/8 cloud, no wind, no rain, 2/4 moon, temp 12°C-11°C	Call playback	2hrs 18.25 – 20.25
	29/06/10	0/8 cloud, no wind, no rain, late 4/4 moon, temp 9°C	Call playback (Section 2.4.2 species) & listening spotlighting	1hr 10mins 1740 - 1850
				1hr 30mins 1720 - 1850
	19/05/11	0/8 cloud, no wind, no rain, late 4/4 moon, temp 15°C	Powerful Owl target searches	1hr 45mins 1645 - 1830
	24/04/12	0/8 cloud, no wind, no rain, temp 16-22°C	Powerful Owl diurnal searches	9hr 5min 0840 - 1745
		0/8 cloud, no wind, no rain, temp 17-16°C	Powerful Owl nocturnal listening & spotlighting	2hrs 50min 1745 - 2035
Arboreal mammals	17/09/01	Fine 21°C,2/8 cloud no rain, wind 5kmph	3 transects of 5 Elliot traps (5 type A)	15 trap nights
	18/09/01	Fine 21°C,0/8 cloud no rain, wind 5kmph	3 transects of 5 Elliot traps (5 type A)	15 trap nights
	19/09/01	Fine 20°C,7/8 cloud no rain, wind 5kmph	3 transects of 5 Elliot traps (5 type A) Spotlighting	15 trap nights Not sourced
	20/09/01	Fine 19°C,0/8 cloud no rain, wind 5kmph	3 transects of 5 Elliot traps (5 type A) Spotlighting.	15 trap nights Not sourced
	09/07/07	0/8 cloud, light W wind, no rain, 12°C	5 transects of 5 Elliot traps (3 type A, 2 type A & B)	25 trap nights
	10/07/07	0/8 cloud, no wind, no rain, 13°C	5 transects of 5 Elliot traps (3 type A, 2 type A & B) Spotlighting	25 trap nights 2hrs 30min 17:30 – 20:00
		2/8 cloud, no wind, no rain, 10°C		
	11/07/07	0/8 cloud, no wind, no rain, 9°C	5 transects of 5 Elliot traps (3 type A, 2 type A & B)	25 trap nights
	12/07/07	0/8 cloud, no wind, no rain, 9.5°C	5 transects of 5 Elliot traps (3 type A, 2 type A & B) Spotlighting	25 trap nights 3hrs 17:45 – 20:45
		0/8 cloud, no wind, no rain, 10°C		
	20/11/07	0/8 cloud, light NE wind, no rain, 26°C	Koala / Squirrel Glider / Yellow-bellied Spotlighting	2hrs 5min 20:05 – 22:10
	21/11/07	8/8 cloud, Nil wind, nil (storm @ 21:00), 17°C	Spotlighting	45min 20:15 – 21:00
	19/05/10	0-8/8 cloud, no wind, pos showers, 1/4 moon, 9°C min	Elliot B trapping: (3 lines)	15 trap nights

Fauna group	Date	Weather conditions	Survey method	Survey effort / time (24hr)
	20/05/10	0/8 cloud, no wind, no rain, 1/2 moon, 9°C min	Elliot B trapping: (3 lines)	15 trap nights
	24/05/10	8/8 cloud, no wind, later rain, 3/4 moon, 12°C min	Elliot B trapping: (3 lines)	15 trap nights
	25/05/10	8/8 cloud, no wind, later rain, 3/4 moon, 11°C min	Elliot B trapping: (3 lines)	15 trap nights
	29/06/10	0/8 cloud, no wind, no rain, late 4/4 moon, temp 9°C	Spotlighting	1hr 30mins 1720 - 1850
	29/06/10	0/8 cloud, no wind, no rain, late 4/4 moon, temp 9°C	Call playback (Section 2.4.3 species) & listening	1hr 10mins 1740 - 1850
	29/06/10	0/8 cloud, no wind, no rain, late 4/4 moon, temp 9°C	Stag-watching	25mins 1715 - 1740
Terrestrial mammals	17/09/01	Fine 21°C,2/8 cloud no rain, wind 5kmph	3 transects of 5 Elliot traps (5 type B)	15 trap nights
	18/09/01	Fine 21°C,0/8 cloud no rain, wind 5kmph	3 transects of 5 Elliot traps (5 type B)	15 trap nights
	19/09/01	Fine 20°C,7/8 cloud no rain, wind 5kmph	3 transects of 5 Elliot traps (5 type B)	15 trap nights
			Spotlighting	Not sourced
	20/09/01	Fine 19°C,0/8 cloud no rain, wind 5kmph	3 transects of 5 Elliot traps (5 type B)	15 trap nights
			Spotlighting.	Not sourced
	09/07/07	0/8 cloud, light W wind, no rain, 12°C	5 transects of 5 Elliot traps (3 type A, 2 type A & B)	25 trap nights
			3 cage traps	3 cage trap nights
	10/07/07	0/8 cloud, no wind, no rain, 13°C	5 transects of 5 Elliot traps (3 type A, 2 type A & B)	25 trap nights
			3 cage traps	3 cage trap nights
		2/8 cloud, no wind, no rain, 10°C	Spotlighting	2hrs 30min 17:30 – 20:00
	11/07/07	0/8 cloud, no wind, no rain, 9°C	5 transects of 5 Elliot traps (3 type A, 2 type A & B)	25 trap nights
			3 cage traps	3 cage trap nights
	12/07/07	0/8 cloud, no wind, no rain, 9.5°C	5 transects of 5 Elliot traps (3 type A, 2 type A & B)	25 trap nights
	19/05/10	0-8/8 cloud, no wind, pos showers, 1/4 moon, 9°C min	Elliot B trapping: (3 lines)	15 trap nights
			Surveillance Camera	1 camera night
	20/05/10	0/8 cloud, no wind, no rain, 1/2 moon, 9°C min	Elliot B trapping: (2 lines)	10 trap nights
			Elliot A trapping: (1 line)	5 trap nights
			Surveillance Camera	1 camera night
	24/05/10	8/8 cloud, no wind, later rain, 3/4 moon, 12°C min	Elliot B trapping: (2 lines)	10 trap nights
			Elliot A trapping: (1 line)	5 trap nights
			Surveillance Camera	1 camera night
	25/05/10	8/8 cloud, no wind, later rain, 3/4 moon, 11°C min	Elliot B trapping: (2 lines)	10 trap nights
			Elliot A trapping: (1 line)	5 trap nights
			Surveillance Camera	1 camera night
	29/06/10	0/8 cloud, no wind, no rain, late 4/4 moon, temp 9°C	Spotlighting	1hr 30mins 1720 - 1850
Bats	19/09/01	Fine 18°C,0/8 cloud, no rain, 5kmph wind	Anabat II Echolocation call detection	1hr 30mins 6.00pm-7.30pm
	20/09/01	Fine 17° C, 5/8 cloud, no rain, no wind	Anabat II Echolocation call detection	1hr 30mins 6.00pm-7.30pm

	10/07/07	2/8 cloud, no wind, no rain, 10°C	Anabat II Echolocation call detection	2hrs 40min 17:15 – 19:55
	12/07/07	0/8 cloud, no wind, no rain, 10°C	Anabat II Echolocation call detection	3hrs 15min 17:30 – 20:45
	20/11/07	0/8 cloud, light NE wind, no rain, 20°C	Anabat II Echolocation call detection	2hrs 25min 19:55 – 22:20
	21/11/07	8/8 cloud, Nil wind, nil (storm @ 21:00), 17°C	Anabat II Echolocation call detection	45min 20:15 – 21:00
	19/05/10	0-8/8 cloud, no wind, showers, 1/4 moon, 9°C min	Harp trap x1	1 Harp trap night
	20/05/10	0/8 cloud, no wind, no rain, 1/2 moon, 9°C min	Harp trap x1	1 Harp trap night
	24/05/10	8/8 cloud, no wind, later rain, 3/4 moon, 12°C min	Harp trap x1	1 Harp trap night
	25/05/10	8/8 cloud, no wind, late rain, 3/4 moon, 11°C min	Harp trap x1	1 Harp trap night
	29/06/10	0/8 cloud, no wind, no rain, late 4/4 moon, temp 9°C	Anabat II & SD-1 / Spotlighting	3hr 30mins 1700 - 1850
	24/04/12	0/8 cloud, no wind, no rain, temp 17-16°C	Anabat Active monitoring	1hr 15min 1745 - 1900
		various	Anabat Passive monitoring x2	Overnight for 2 nights
Reptiles	17/09/01	Fine 21°C,2/8 cloud no rain, wind 5kmph	Habitat Search	1hr 3.00--4.00pm
	18/09/01	Fine 21°C,0/8 cloud no rain, wind 5kmph	Habitat Search	1hr 8.00-9.00am
	19/09/01	Fine 20°C,7/8 cloud no rain, wind 5kmph	Habitat Search	1hr 8.00-9.00am
	20/09/01	Fine 19°C,0/8 cloud no rain, wind 5kmph	Habitat Search	1hr 8.00--9.00am
	09/07/07	8/8 cloud, light SE wind, showers, 15°C	Opportunistic observation / Habitat Search	4hrs 13:50 - 17:50
	10/07/07	0/8 cloud, light W wind, no rain, 12-16°C	Opportunistic observation / Habitat Search	2hrs 15min 8:30 – 10:45
	11/07/07	0/8 cloud, no wind, no rain, 13-18°C	Opportunistic observation / Habitat Search	2hrs 30min 8:35 – 11:05
	12/07/07	0/8 cloud, no wind, no rain, 9-14°C	Opportunistic observation / Habitat Search	2hrs 20min 8:35 – 10:55
	13/07/07	0/8 cloud, no wind, no rain, 9.5-18°C	Opportunistic observation / Habitat Search	2hrs 25min 8:40 – 11:05
	20/11/07	0/8 cloud, light NE wind, no rain, 26°C	Spotlighting	2hr 5min 20:05 – 22:10
	21/11/07	8/8 cloud, Nil wind, nil, 24°C	Spotlighting	45min 20:15 – 21:00
	29/06/10	0/8 cloud, no wind, no rain, temp 13°C	Habitat search, opportunistic	3hrs 25mins 1350 - 1715
	24/04/12	0/8 cloud, no wind, no rain, temp 16-22°C	Opportunistic	9hr 5min 0840 - 1745
Amphibians	17/09/01	Fine 21°C,2/8 cloud no rain, wind 5kmph	Call Detection and Habitat Search	1hr 3.00--4.00pm
	19/09/01	Fine 18°C,0/8 cloud, no rain, 5kmph wind	Call Detection and Habitat Search Spotlighting	2hrs, 5.00pm-7.00pm
	20/09/01	Fine 17° C, 5/8 cloud, no rain, no wind	Call Detection and Habitat Search Spotlighting	2hrs, 5.00pm-7.00pm
	10/07/07	2/8 cloud, no wind, no rain, 10°C	Spotlighting	2hrs 30min 17:30 – 20:00
	12/07/07	0/8 cloud, no wind, no rain, 10°C	Spotlighting	3hrs 17:45 – 20:45
	20/11/07	0/8 cloud, light NE wind, no rain, 26°C	Call Playback, Spotlighting	2hr 5min 20:05 – 22:10
	21/11/07	8/8 cloud, Nil wind, nil, 24°C	Spotlighting	45min 20:15 – 21:00
	29/06/10	0/8 cloud, no wind, no rain, late 4/4 moon, temp 9°C	Call detection & spotlighting	1hr 30mins 1720 - 1850
	24/04/12	0/8 cloud, no wind, no rain, temp 17-16°C	Call detection & spotlighting	2hrs 50min 1745 - 2035

Attachment 2:

MAPPING

Figure 3: Flora & Fauna Survey Effort and Results (updated)
Figure 4: Powerful Owl Target Searches (new)
Figure 5: Fauna survey effort in the locality by Travers bushfire & ecology 2003-2012

Figure 3 - Flora & Fauna Survey Effort and Results

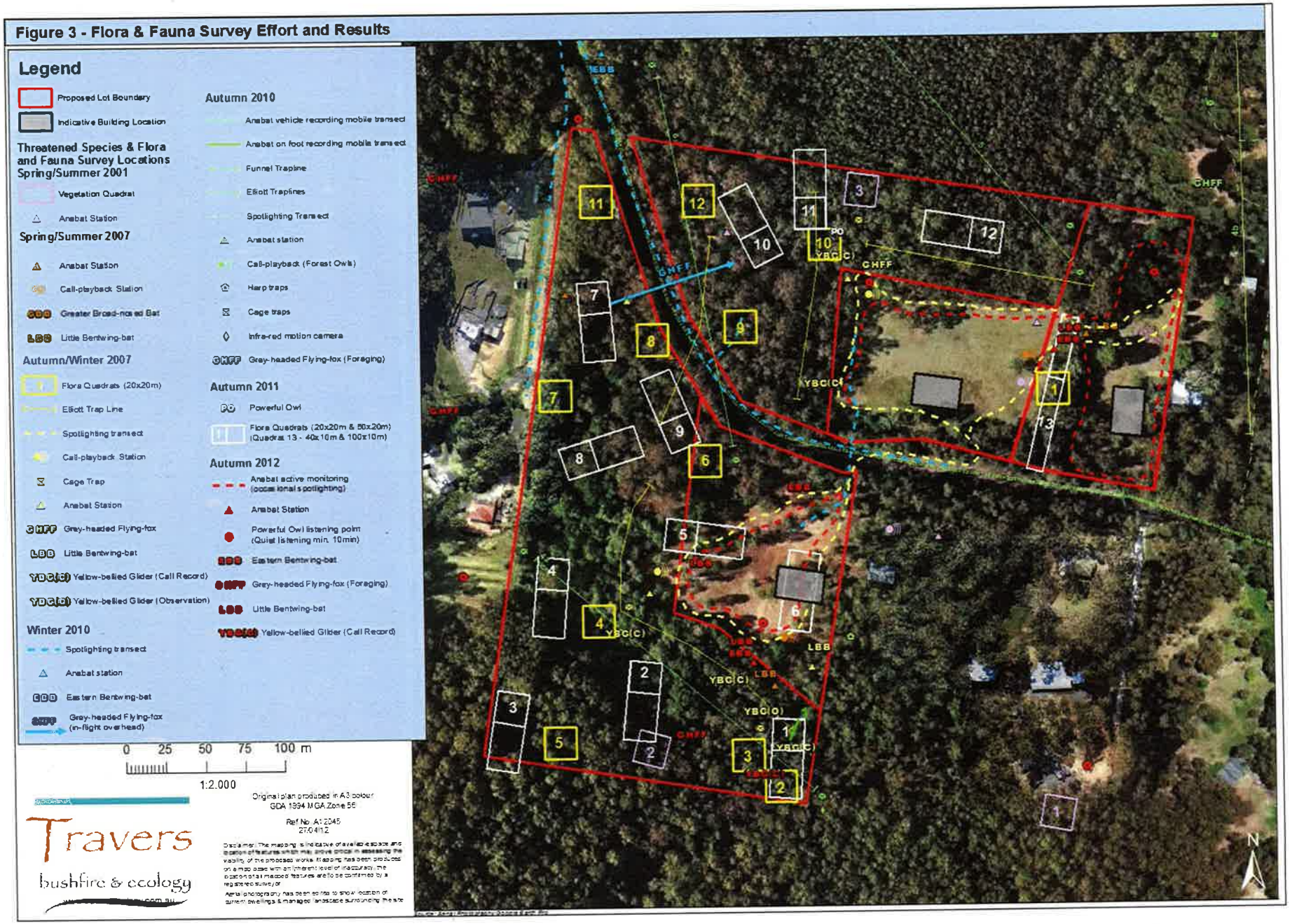


Figure 4 - Powerful Owl Target Searches

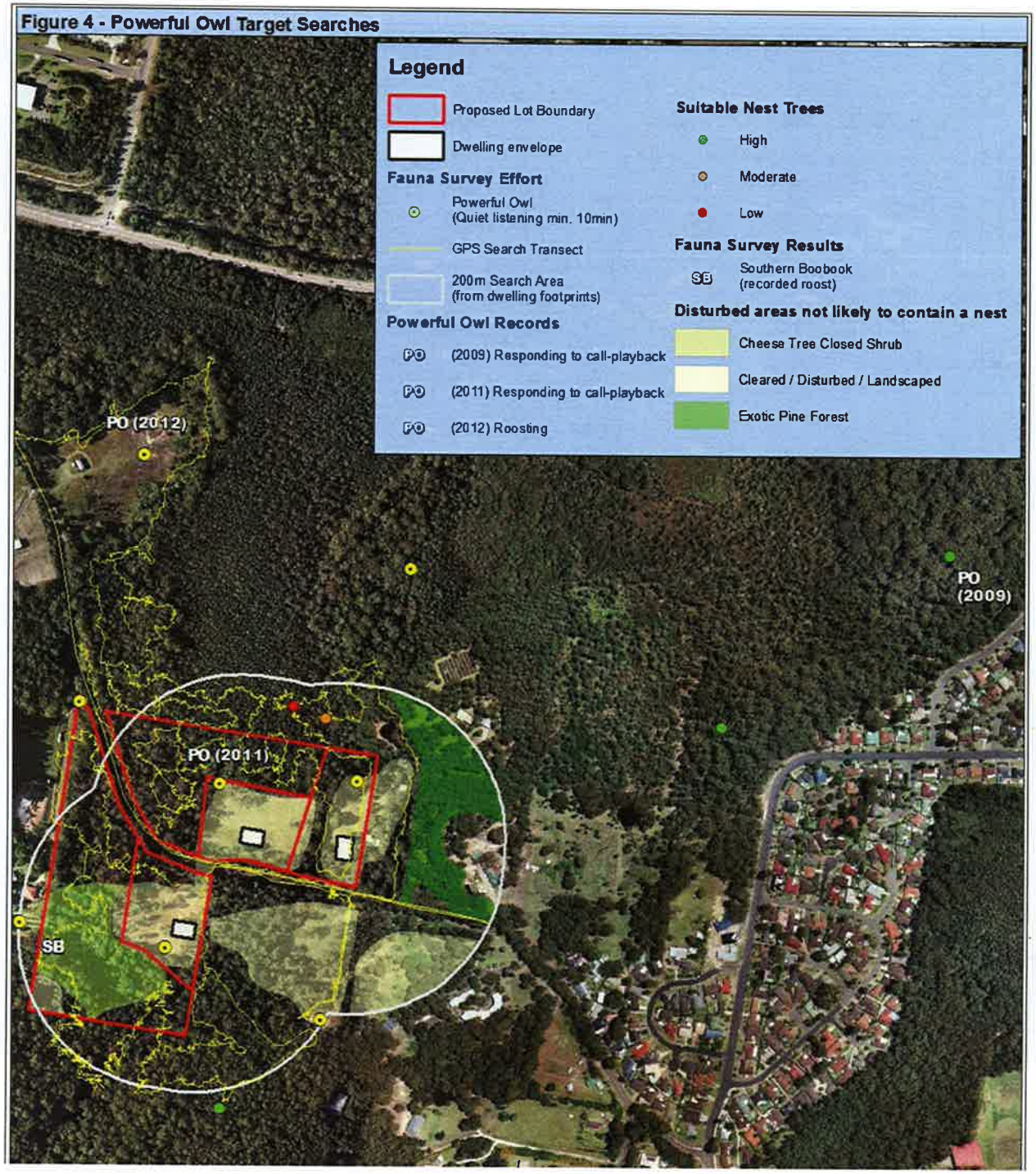
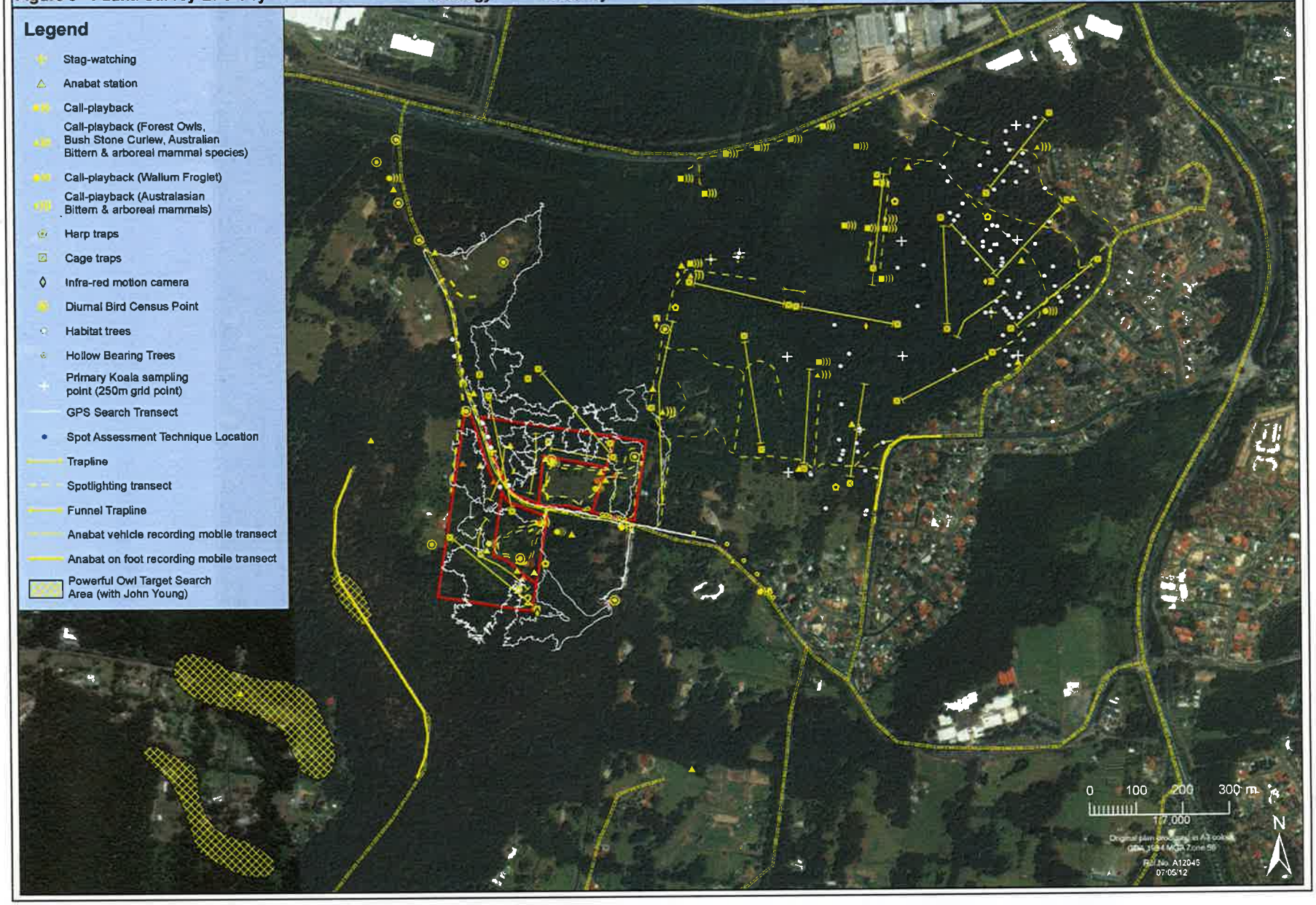
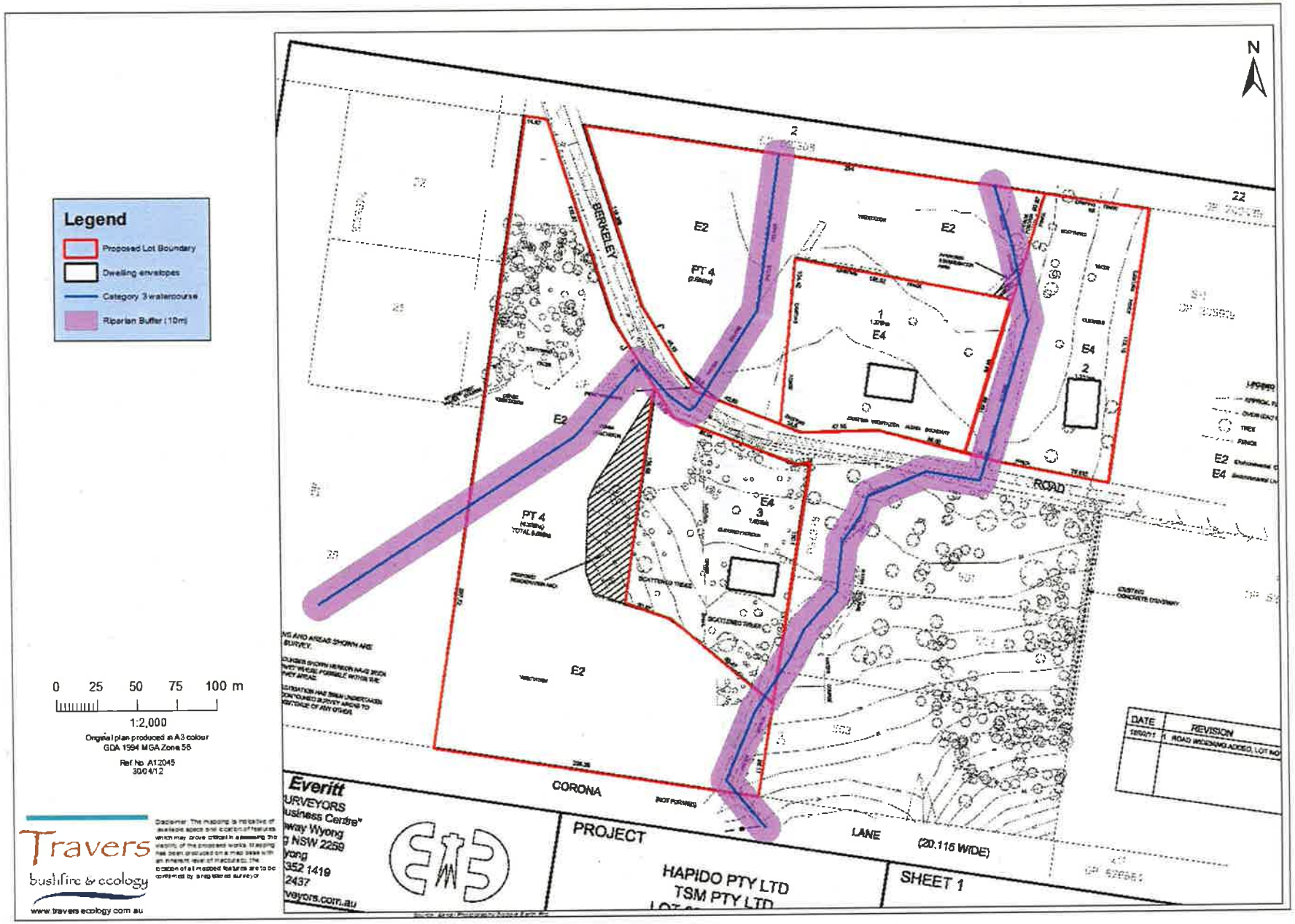


Figure 5 - Fauna Survey Effort by *Travers bushfire and ecology* in the locatility



Attachment 3:

SURVEY PLAN SHOWING RIPARIAN CORRIDORS


Legend
Proposed Lot Boundary
Dwelling envelopes
Category 3 watercourse
Riparian Buffer (10m)
N
BERKELEY
ROAD
CORONA
LANE
(20.116 WIDE)
E2
E4
PT 4
0 25 50 75 100 m
1:2,000
Original plan produced in A3 colour
GDA 1994 MGA Zone 56
Ref No A12045
30/04/12
Travers
bushfire & ecology
www.travers.ecology.com.au
Everitt
URVEYORS
usiness Centre"
way Wyong
NSW 2259
yong
352 1419
2437
rveyors.com.au
PROJECT
HAPIDO PTY LTD
TSM PTY LTD
SHEET 1
DATE
REVISION