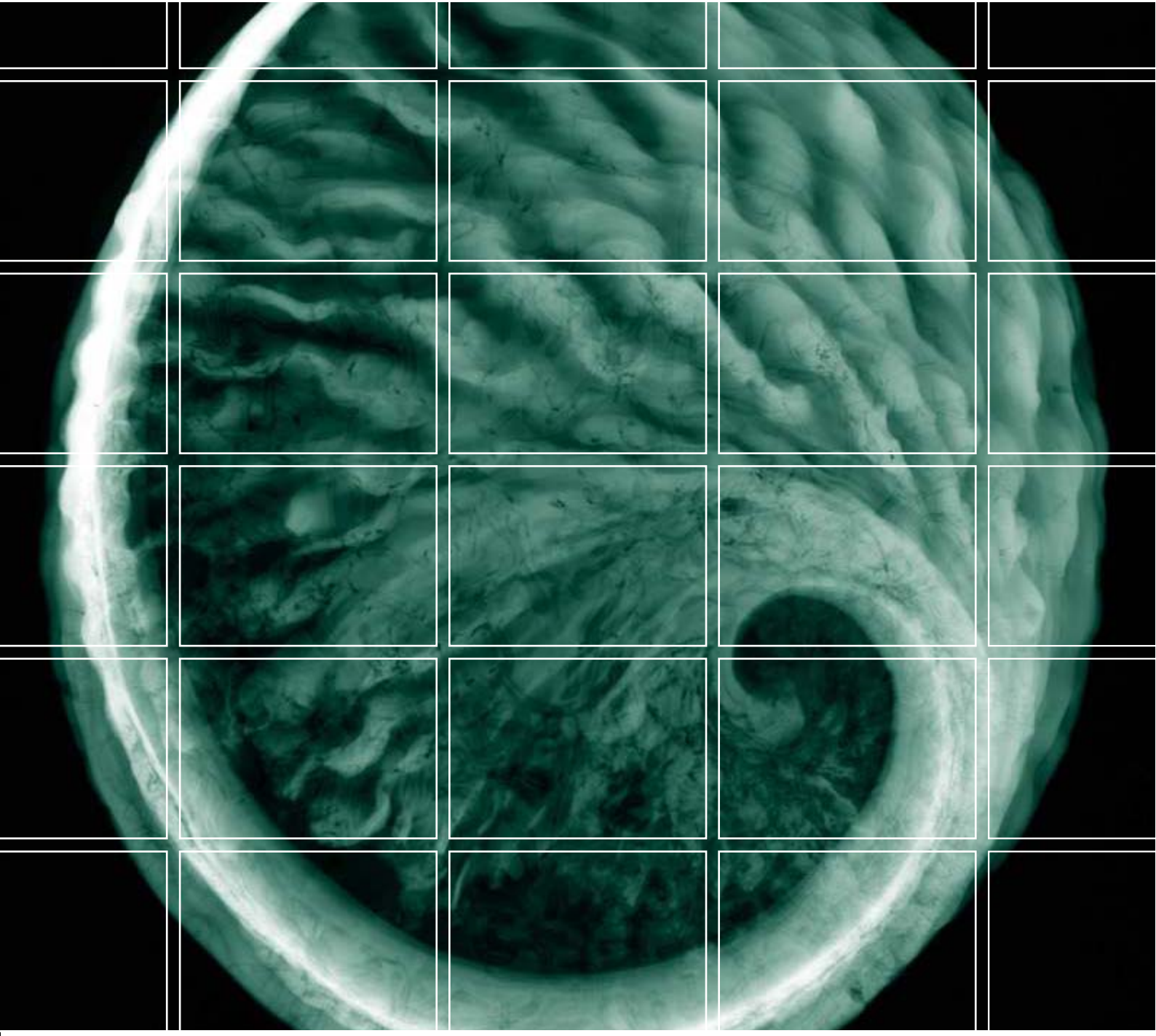

South West Rocks Rosarii

Ecological Assessment

Macleay Valley Property Group Pty Ltd

January 2007

0045027

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ERM

Approved by:	*Renae Baker*
Position:	Project Manager
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Date:	*9 January, 2007*
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Position:	Project Director
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Date:	*9 January, 2007*

Environmental Resources Management Australia Pty Ltd Quality System

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FINAL REPORT

Macleay Valley Property Group Pty Ltd

South West Rocks Rosarii
Ecological Assessment

January 2007

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1 INTRODUCTION

Environmental Resources Management Australia Pty Ltd (ERM) has been commissioned by Macleay Valley Property Group Pty Ltd to prepare an Environmental Assessment Report under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for a proposed residential subdivision of Lot 2 in DP 581117, commonly known as 334 – 356 Gregory Street, South West Rocks (hereafter referred to as 'the site').

In correspondence dated 21 November 2005, the Department of Planning (DoP) confirmed that it has determined that the proposed subdivision is a 'major project' to which Part 3A of the EP&A Act applies.

1.1 BACKGROUND

Lot 2 in DP 581117 is 4.8 ha in area and is located on the north east intersection of Gregory Street and Arakoon Road, approximately 3 kilometres south of the town centre of South West Rocks and 3.5 kilometres directly south of the nearest coastline (Trial Bay).

Existing residential subdivision in the South West Rocks township is located west of the site, on Gregory Street. Spencers Creek passes approximately 150 metres to the west of the site. Rural and rural residential properties are located to the north and north-east and Hat Head National Park, which includes wetlands, is located to the south. Arakoon Road separates the site from Hat Head National Park. Land to the north is zoned but not yet developed for residential development. It is understood that applications for development of the properties to the north have been lodged with DoP and Kempsey Shire Council. There is no rural zoned land adjacent to the site.

Previous preliminary ecological investigations of the site by Connell Wagner (Connell Wagner 2005) recorded two threatened arboreal mammal species, the Squirrel Glider (*Petaurus norfolcensis*) and the Brush-tailed Phascogale (*Phascogale tapoatafa*), within the site. In addition, one threatened owl species, the Masked Owl (*Tyto novaehollandiae*), responded to call playback and one threatened microchiropteran bat, the Little Bent-wing Bat (*Miniopterus australis*), was recorded with an Anabat detector. The Grey-headed Flying-fox (*Pteropus poliocephalus*) was recorded foraging on the site and an Osprey (*Pandion haliaetus*) was recorded flying over the site.

ERM conducted further ecological investigations of the site in April 2006 and provided Macleay Valley Property Group Pty Ltd advice in relation to the potential ecological constraints and development opportunities associated with the site (ERM 2006). No field work was undertaken north of Cooper Street as it will not be developed as part of this proposal.

1.2 PURPOSE

The purpose of this report is to provide Macleay Valley Property Group Pty Ltd with the results of an ecological assessment of the site, an assessment of the potential impacts associated with the proposed residential development of the site and recommendations for management and mitigation of the identified potential impacts.

2 METHODOLOGY

2.1 DESKTOP ASSESSMENT

Background literature reviews and database searches were conducted prior to field investigations to gain recent data on any threatened species or endangered ecological communities known from, or with the potential to occur within, a 10 km radius of the site (within the locality).

The Department of Environment and Conservation (DEC) Wildlife Atlas Database was searched for records of threatened species listed under the NSW *Threatened Species Conservation Act 1995* (TSC Act) within the locality and the results plotted using a Geographic Information System (GIS).

An on-line search for matters of National Environmental Significance (NES) protected under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) was undertaken for the locality.

Field investigations were then formulated based on the findings of the desktop assessment.

2.2 FIELD INVESTIGATIONS

Field investigations of the site were undertaken by two ecologists from 18 to 21 April 2006. The following techniques were used to survey the flora and fauna of the site:

2.2.1 *Vegetation Mapping*

Vegetation of the site was mapped by undertaking flora surveys within 20 m x 20 m quadrats and random meander searches to identify any additional species not recorded within quadrats.

The boundaries of vegetation types were recorded using a Global Positioning System (GPS) and later mapped using GIS.

2.2.2 *Fauna Surveys*

Hollow-Bearing Tree Survey

A hollow-bearing tree survey was undertaken to determine the significance of trees within the site to native fauna that utilise hollows as shelter or nesting habitat. The location, species, DBH (Diameter at Breast Height), number of hollows and size of hollows was recorded. In addition, each hollow-bearing tree was flagged using blue flagging tape and the flagging was labelled with permanent marker so that each tree could be identified again in the field (see *Photograph A.1*) (*Annex A*).

Elliott Trapping

Due to the small size and shape of the site transect lines were not used. Instead, Elliott traps were located across the entire site in all vegetation types. Bait used in all traps was a mixture of peanut butter, rolled oats and honey. Traps were closed during the day to prevent any non-target fauna such as reptiles entering the traps. Total number of trap nights was 60.

Sixteen tree-mounted B-size Elliott traps were placed on brackets drilled into mature trees. The trunks of trees close to the traps were sprayed with a honey / water mixture to attract arboreal mammals to the traps.

Twenty-four A-size Elliott traps were placed on the ground and also tied into shrubs to target the Eastern Pygmy Possum (*Cecartetus nanus*) and other small arboreal mammals such as the Brush-tailed Phascogale.

Call Playback

Owl call playback for the threatened Powerful Owl (*Ninox strenua*) and Masked Owl was undertaken on 18 April 2006. Playback was undertaken for a period of five minutes with a listening period of ten minutes for both species and repeated three times. Due to the lack of suitable roosting habitat for these bird species within the site call playback was not undertaken over subsequent nights.

Spotlighting

Spotlighting was undertaken over three nights by two ecologists using handheld spotlights. Spotlighting was undertaken across the entire site for 1.5 person hours each night (totalling 4.5 person hours).

Anabat Detection

Anabat detection was used to detect microchiropteran bat species that may be utilising the site. Two Anabat detectors were left in the field for three nights, at different locations across the site on each night. Data obtained were then sent to Glenn Hoye of Fly by Night Bat Surveys Pty Ltd for analysis.

SEPP 44 Koala Habitat Assessment

A Koala Habitat Assessment as defined in *State Environmental Planning Policy 44* (SEPP 44) was undertaken to determine if the site would be classed as core Koala habitat.

Opportunistic Records

Other fauna species not specifically targeted in field surveys, such as diurnal birds, were recorded opportunistically.

3 RESULTS

3.1 DESKTOP ASSESSMENT

3.1.1 Threatened Species

Threatened fauna species previously recorded within the locality are shown in *Figure 3.1* (DEC 2006). No threatened flora species have previously been recorded within the locality of the site. An additional 26 species (or their habitats) listed as threatened under the EPBC Act were considered to have the potential to occur within the locality (DEH 2006). The full protected matters search is provided as *Table B.1, Annex B.*

The likelihood of the threatened species identified from database searches occurring within the site was assessed by comparing known habitat requirements with habitat on the site (*Table C.1 Annex C*). The assessment of likelihood identified 11 of the 32 listed threatened species (or their habitats) had the potential to occur on the site. Of the 11 species, only six were considered to require an assessment of significance; the Brush-tailed Phascogale, Eastern Bent-wing Bat (*Miniopterus schreibersii oceanensis*), Eastern Freetail Bat (*Mormopterus norfolkensis*), Fishing Bat (*Myotis adversus/macropus*), Grey-headed Flying-fox, Little Bent-wing Bat and the Squirrel Glider.

Connell Wagner (2005) recorded the following threatened species on site during preliminary field investigations in August 2005:

- Squirrel Glider;
- Brush-tailed Phascogale;
- Grey-headed Flying-fox; and
- Little Bent-wing Bat.

The Masked Owl responded to call playback conducted on site but was not recorded on the site. The Osprey was recorded flying over the site.

No threatened flora species were recorded on the site.

G:\GIS\Minor Projects\0045027 Sth West Rocks\0045027 Fig 3.1Threatened Spp.WOR 29.08.06 Environmental Resources Management Australia Pty Ltd

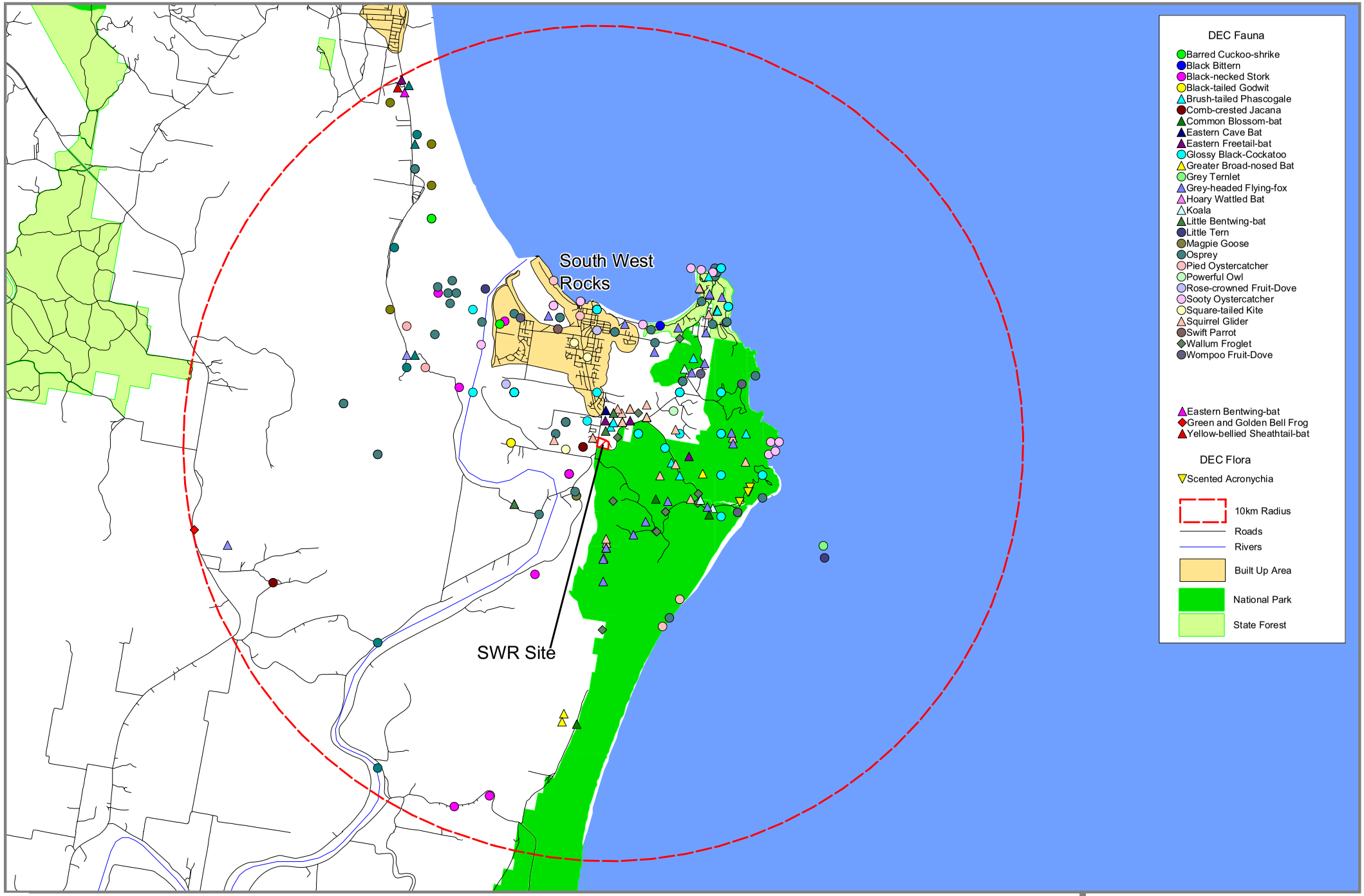

Figure 3.1 Threatened Species previously recorded within the locality (DEC 2006)

3.1.2 Endangered Ecological Communities

Twelve endangered ecological communities are considered to have the potential to occur within the region (DEC 2006). Connell Wagner (2005) identified Subtropical Coastal Floodplain Forest of the NSW North Coast bioregion occurring within the site.

3.1.3 Fauna Movements

Potential fauna movements within the locality of the site are shown on *Figure 3.2*. From interpretation of aerial photographs and topographic maps of South West Rocks, any potential corridor function of the site appears to be currently restricted by several areas of developed and cleared land within the locality and these are discussed below.

Residential development along Gregory Street to the west of the site would restrict fauna movements from the site and from Hat Head National Park to heavily vegetated areas to the northwest. It is likely that fauna movement can now only occur in this direction from the National Park via scattered trees or the riparian vegetation along Spencers Creek.

Land to the north of the site consists of rural residential properties which are zoned for residential development. North of these properties, cleared land with scattered trees provides limited connection to wetland and estuarine vegetation to the north and the northeast.

Directly north east of the site fauna movement could occur along a narrow corridor of roadside vegetation along Arakoon Road, and further east to the vegetation of the Smoky Cape Range (part of Hat Head National Park).

To the south a narrow corridor of woodland / forest vegetation exists along Gregory Street, providing potential for fauna movement from Hat Head National Park northwards to the site. West of this corridor wetland vegetation would restrict the movement of forest-dependent fauna.

Potential fauna movements from surrounding areas through the site are shown on *Figure 3.2* as black arrows. Alternate fauna movements around the site are shown in *Figure 3.2* as red arrows.

NPWS has produced a map of key habitats and regional and subregional fauna movement corridors within the north east of NSW (Canri Website). Two regional corridors occur within the locality of the site and these are shown in *Figure 3.3*. The site has not been identified as contributing to these corridors, nor has it been identified as key habitat.

G:\GIS\Minor Projects\0045027\0045027 Fig 3.2 PFM.WOR 20.10.2006 Environmental Resources Management Australia Pty Ltd

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Figure 3.2 Potential Fauna Movements

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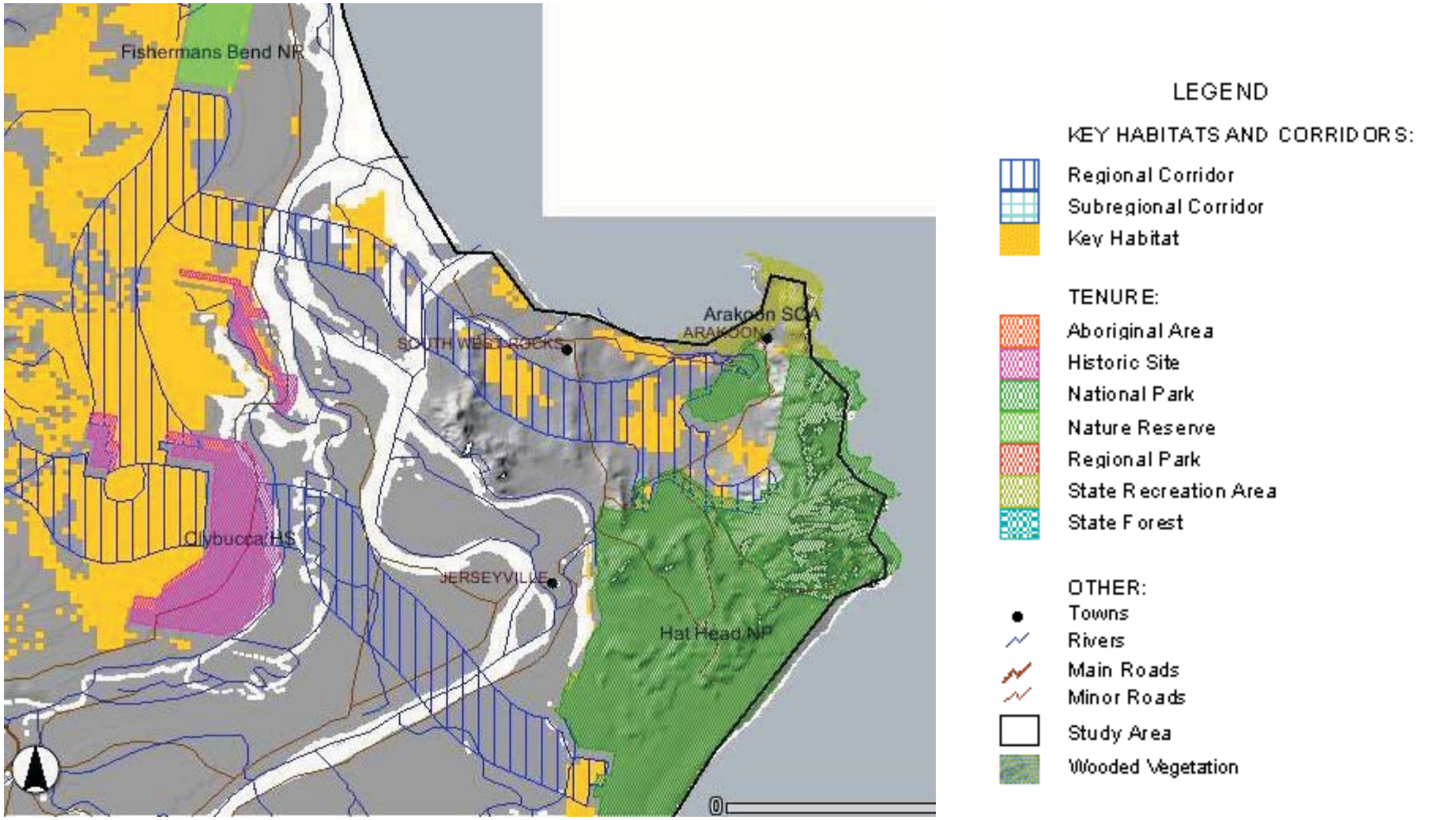

Source: Canri Website

Figure 3.3 **Regional and Subregional Corridors and Key habitats identified within the locality of the site (Canri Website)**

3.2 *FIELD INVESTIGATIONS*

Field investigations undertaken by ERM in April 2006 revealed that the site consists of scattered trees over a slashed understorey (see *Photograph A.2*) (*Annex A*). Slashing had occurred recently at the site. Some native shrubs remained around the bases of large trees, around the residence on the site and scattered in the north east of the site where no mowing or slashing had recently occurred and the ground cover remained (see *Photograph A.3*) (*Annex A*). One small area of the site has been fenced off for the purpose of horse agistment and a residence exists along Cooper Street in the north of the site. There are no fences surrounding the west or south of the site and therefore people, dogs and vehicles can move freely across it.

Disturbances present at the site include the presence of exotic grasses and other exotic ground cover species, the presence of Blackberry (*Rubus fruticosus*) which is a Weed of National Significance (WONS), horse agistment, residential development, the presence of the Red Fox (*Vulpes vulpes*) and ongoing slashing of the ground cover and understorey.

3.2.1 *Threatened Species*

Threatened fauna species recorded during the field investigations by ERM in April 2006 were:

- Brush-tailed Phascogale - two Brush-tailed Phascogales were captured over two separate nights (one phascogale on each occasion) in a Coastal Banksia (*Banksia integrifolia*) and a Forest Red Gum (*Eucalyptus tereticornis*) in the west of the site (see *Figure 3.4*);

- Squirrel Glider - one Squirrel Glider was captured in a B-size tree-mounted Elliott trap and two Squirrel Gliders were identified during spotlighting in the eastern parts of the site where canopy cover is more dense (see *Figure 3.4)*;

- Grey-headed Flying-fox – individuals of this species arrived at the site to forage shortly after sunset; and

- *Myotis adversus* (Fishing Bat), *Miniopterus australis* (Little Bent-wing Bat), *Mormopterus norfolkensis* (Eastern Freetail Bat) and *Miniopterus schreibersii* (Eastern Bent-wing Bat) were recorded at the site using Anabat ultrasonic call detection.

No other threatened fauna species were recorded.

G:\GIS\Minor Projects\0045027\0045027 Fig 3.4 .WOR 20.10.2006 Environmental Resources Managemet Pty Ltd

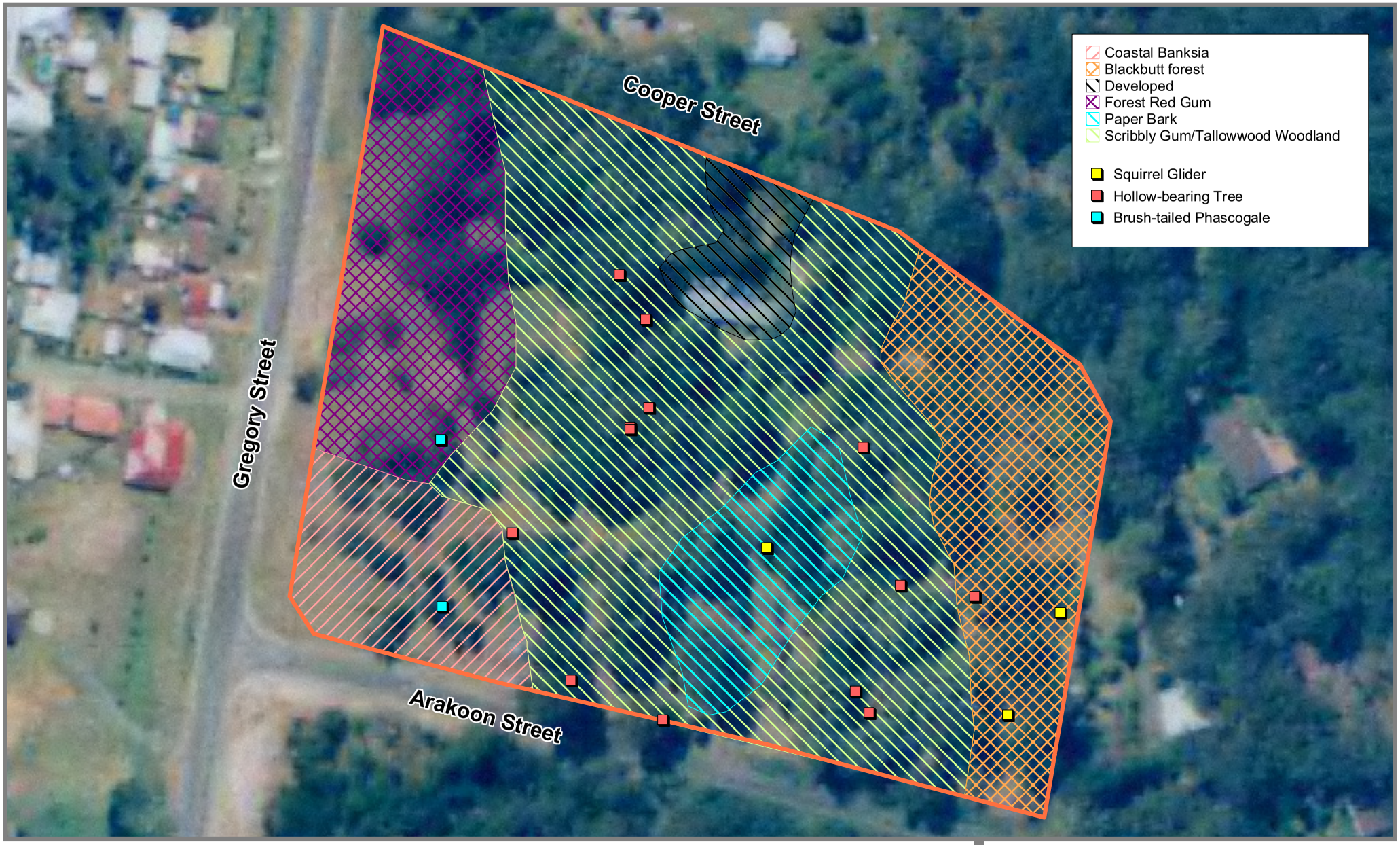

Figure 3.4 Locations of Threatened Species, Vegetation Communities and Hollow-Bearing Trees Recorded at the Site in April 2006 (ERM)

Although Koala feed trees are present within the site no scats or other indirect evidence of the Koala were found at the site and it would not be classified as core Koala habitat as defined under SEPP44.

There were no threatened flora species recorded at the site during field investigations.

3.2.2 Fauna Species

Other non-threatened fauna species recorded within the site during field investigations are listed in *Table D2* (*Annex D*). Two exotic mammal species, the Red Fox and the House Mouse (*Mus musculus*), were recorded during field surveys. Domestic animals recorded on site included a dog from a neighbouring property and a horse.

Spotlighting revealed that the majority of nocturnal mammal activity occurs in the north eastern portion of the site, as well as within the trees close to the residence. Gliders (Sugar Gliders (*Petaurus breviceps*) and Squirrel Gliders) and flying-foxes (Grey-headed and Little Red) were recorded within these areas, foraging and interacting. Two Sugar Gliders were also observed during diurnal surveys.

Macropod scats were found but were not recorded in high densities and no wallabies or kangaroos were recorded on site. No small ground-dwelling native fauna species such as antechinus were trapped in Elliott traps, which is consistent with the lack of suitable ground cover and understorey at the site.

No amphibians were recorded on the site and there is no permanent habitat for them at the site. Bird species recorded were mainly larger species such as Kookaburras (*Dacelo novaeguineae*) utilising the mature trees. Some smaller bird species such as thornbills were recorded in areas where some shrubs exist. A Brahminy Kite (*Haliaster indus*) nest previously recorded by Connell Wagner (2005) was also recorded during these surveys, and appears to be still active, with two kites recorded visiting the nest.

3.2.3 Fauna Habitat

Primary habitat for native fauna species was limited to the trees within the site. A small area in the north east corner of the site also provided some limited habitat in the form of scattered native shrubs and grasses.

Reptiles and birds would be able to utilise the majority of the site. There was no habitat suitable for amphibians and no wet areas were recorded within or immediately adjacent to the site. However one area where *Melaleuca* species were recorded is low-lying and may become inundated during periods of heavy rainfall.

The shrubs within the site were sparse and scattered and were considered to provide some limited foraging resources for native fauna. Many shrubs were exotic species that were garden escapes or planted species. These occurred mostly in the area mapped as 'developed' (*Figure 3.4*).

Hollow-Bearing Trees

Twelve hollow-bearing trees were recorded within the site. One of these was a Coastal Banksia. The results of the hollow-bearing tree survey are provided in *Table 3.1*. The locations of these trees are shown in *Figure 3.4*. Most of the hollows were less than 5 cm in diameter.

Table 3.1 Hollow-bearing Tree Survey Results

Species Name	Common Name	DBH (cm)	Number of Hollows	Size (cm)
Eucalyptus racemosa	Scribbly Gum	65.7	1	5
Eucalyptus microcorys	Tallowood	134	4	10
Eucalyptus microcorys	Tallowood	85	1	25
Eucalyptus racemosa	Scribbly Gum	142	2	5
Eucalyptus racemosa	Scribbly Gum	81.3	2	3
Eucalyptus microcorys	Tallowood	134	1	10
Eucalyptus microcorys	Tallowood	96	1	3
Stag	Tallowood	88	1	3
Eucalyptus microcorys	Tallowood	127	2	3
Eucalyptus microcorys	Tallowood	94	1	3
Banksia integrifolia	Coastal Banksia	38	1	3
Eucalyptus microcorys	Tallowood	88	2	3

3.2.4 Vegetation

Previous and ongoing disturbances at the site have resulted in reduced floristic diversity and invasion of many weed species, particularly Blackberry. If slashing were not occurring at the site then it is likely that the ground cover would be dominated by Blackberry and Bracken Fern (*Pteridium esculentum*). A flora species list is provided as *Table D.1* (*Annex D*).

Vegetation communities at the site were defined based on the dominant canopy species present, as much of the shrub and ground layers have been subject to extensive and ongoing clearing and disturbance. The canopy species present at the site were also noted within the Hat Head National Park across Arakoon Road, along Cooper Street and within wooded areas to the north of the site.

The following vegetation communities were recorded at the site and their locations are shown in *Figure 3.4*:

- Scribbly Gum / Tallowwood Woodland

This community occurred across most of the site and was dominated by *Eucalyptus microcorys* (Tallowwood) and *E. haemostoma* (Scribbly Gum). Areas close to the residence on site retained some native shrub species, and some remnants of shrubs were recorded around the bases of trees. One low-lying area within this community was dominated by *Melaleuca quinquenervia* (Paperbark) and *Allocasuarina littoralis* (She-Oak), which are species often found along depressions and drainage lines, indicating this area may become inundated during periods of heavy rain. This vegetation community is not listed as threatened under State or Commonwealth legislation.

- Blackbutt Open Forest

This community occurred in the eastern portion of the site. *E. pilularis* (Blackbutt) and Tallowwood were the dominant canopy species in this part of the site. Some native grasses and shrubs were also recorded in this area. This vegetation community is not listed as threatened under State or Commonwealth legislation.

- Forest Red Gum

The area dominated by Forest Red Gum was found in the west of the site. The shrub and ground cover had been extensively disturbed, with exotic grasses and pasture species being dominant. A large portion of this area had been fenced off and was being used for horse agistment. Connell Wagner (2005) considered this community to be consistent with the endangered ecological community Subtropical Coastal Floodplain Forest. Consideration of the occurrence of this community at the site is provided in *Chapter 4*.

- Coastal Banksia

A small area in the southwest of the site consisted of Coastal Banksia over a slashed grassy understorey (see *Photograph A.4*, *Annex A*). The *Banksias* in this area were growing to a height of around 8 to 10 m and at the time of surveys some were still flowering. This vegetation community is not listed as threatened under State or Commonwealth legislation.