| | | |
|---|---|---|
| # | Grey Butcherbird | *Cracticus torquatus* |
| # | Australian Magpie | *Gymnorhina tibicen* |
| # | Pied Currawong | *Strepera graculina* |
| | **Family Corvidae - Crows, Raven** | |
| # | Australian Raven | *Corvus coronoides* |
| | Forest Raven | *Corvus tasmanicus* |
| | **Family Corcoracidae - Mudnest-builders** | |
| | White-winged Chough | *Corcorax melanorhamphos* |
| | **Family Ptilinorhynchidae - Bowerbirds** | |
| # | Satin Bowerbird | *Ptilinorhynchus violaceus* |
| | **Family Motacillidae - Pipits and Wagtails** | |
| | Richard's Pipit | *Anthus novaseelandiae* |
| | **Family Passeridae - Sparrows, Grassfinches, Mannikins** | |
| | Red-browed Firetail | *Aegintha temporalis* |
| | Chestnut-breasted Mannikin | *Lonchura castaneothorax* |
| | *House Sparrow | *Passer domesticus* |
| | Double-barred Finch | *Poephila bichenovii* |
| | **Family Fringillidae - Other Finches** | |
| | *European Goldfinch | *Carduelis carduelis* |
| | **Family Dicaeidae - Flowerpeckers** | |
| | Mistletoebird | *Dicaeum hirundinaceum* |
| | **Family Hirundinidae - Swallows and Martins** | |
| # | Fairy Martin | *Cecropis ariel* |
| # | Tree Martin | *Cecropis nigricans* |
| # | Welcome Swallow | *Hirundo neoxena* |
| | **Family Sylvidae - Old World Warblers** | |
| | Clamorous Reed-Warbler | *Acrocephalus stentoreus* |
| | Golden-headed Cisticola | *Cisticola exilis* |
| | Little Grassbird | *Megalurus gramineus* |
| | Tawny Grassbird | *Megalurus timoriensis* |
| | **Family Zosteropidae - White-eyes** | |
| | Silvereye | *Zosterops lateralis* |
| | **Family Sturnidae - Starlings and Mynas** | |
| # | *Common Myna | *Acridotheres tristis* |
| # | *Common Starling | *Sturnus vulgaris* |

## AMPHIBIANS

| | | |
|---|---|---|
| Family Myobatrachidae - 'Southern' Frogs | | |
| # | Common Eastern Froglet | *Crinia signifera* |
| | **Wallum Froglet** | ***Crinia tinnula*** |
| | Eastern Banjo Frog | *Limnodynastes dumerilii* |
| | Ornate Burrowing Frog | *Limnodynastes ornatus* |
| | Striped Marsh Frog | *Limnodynastes peronii* |
| # | Spotted Grass Frog | *Limnodynastes tasmaniensis* |
| | Brown Toadlet | *Pseudophryne bibronii* |
| | Red-backed Toadlet | *Pseudophryne coriacea* |
| | | *Uperoleia fusca* |
| | Smooth Toadlet | *Uperoleia laevigata* |
| Family Hylidae - Tree Frogs | | |
| | Green Tree Frog | *Litoria caerulea* |
| | Red-eyed Green Tree Frog | *Litoria chloris* |
| | Bleating Tree Frog | *Litoria dentata* |
| # | Dwarf Tree Frog | *Litoria fallax* |
| | Freycinet's Frog | *Litoria freycineti* |
| | Dainty Tree Frog | *Litoria gracilenta* |
| | Jervis Bay Tree Frog | *Litoria jervisensis* |
| | Broad-palmed Frog | *Litoria latopalmata* |
| | Lesueur's Frog | *Litoria lesueuri* |
| | Rocket Frog | *Litoria nasuta* |
| | Peron's Tree Frog | *Litoria peronii* |
| | Green Leaf Tree Frog | *Litoria phyllochroa* |
| | Tyler's Tree Frog | *Litoria tyleri* |
| | Verreaux's Tree Frog | *Litoria verreauxii* |

## REPTILES

| | | |
|---|---|---|
| Family Chelidae - Tortoises | | |
| | Eastern Snake-necked Tortoise | *Chelodina longicollis* |
| Family Gekkonidae - Geckoes | | |
| | Wood Gecko | *Diplodactylus vittatus* |
| | Lesueur's Velvet Gecko | *Oedura lesueurii* |
| | Thick-tailed Gecko | *Underwoodisaurus milii* |
| Family Pygopodidae - Legless Lizards | | |
| | Burton's Snake-lizard | *Lialis burtonis* |
| | Common Scaly-foot | *Pygopus lepidopus* |
| Family Agamidae - Dragons | | |
| | Jacky Lizard | *Amphibolurus muricatus* |
| | Eastern Water Dragon | *Physignathus lesuerii* |
| | Eastern Bearded Dragon | *Pogona barbata* |
| Family Varanidae - Monitors | | |
| | Lace Monitor | *Varanus varius* |
| Family Scinidae - Skinks | | |
| | | *Carlia tetradactyla* |
| | Tussock Rainbow Skink | *Carlia vivax* |
| | Wall Lizard | *Cryptoblepharus virgatus* |
| | Striped Skink | *Ctenotus robustus* |
| | Copper-tailed Skink | *Ctenotus taeniolatus* |
| | Cunningham's Skink | *Egernia cunninghami* |

| | | |
|---|---|---|
| | | *Egernia modesta* |
| | Black Rock Skink | *Egernia saxatilis* |
| | White's Skink | *Egernia whitii* |
| | Eastern Water Skink | *Eulamprus quoyii* |
| | | *Eulamprus tenuis* |
| # | Grass Skink | *Lampropholis delicata* |
| # | Garden Skink | *Lampropholis guichenoti* |
| | | *Lygisaurus foliorum* |
| | Red-throated Skink | *Pseudomoia platynota* |
| # | Three-toed Skink | *Saiphos equalis* |
| | Weasel Skink | *Saproscincus mustelinus* |
| | Eastern Blue-tongued Lizard | *Tiliqua scincoides* |
| Family Typhlopidae - Blind Snakes | | |
| | | *Ramphotyphlops nigrescens* |
| | | *Ramphotyphlops proximus* |
| | | *Ramphotyphlops wiedii* |
| Family Boidae - Pythons | | |
| | Carpet (Diamond) Python | *Morelia spilota* |
| Family Colubridae | | |
| | Brown Tree Snake | *Boiga irregularis* |
| | Green Tree Snake | *Dendralaphis punctulata* |
| Family Elapidae - Venomous Snakes | | |
| | Death Adder | *Acanthopis antarcticus* |
| | Dwarf Crowned Snake | *Cacophis krefftii* |
| | Golden Crowned Snake | *Cacophis squamulosus* |
| | Yellow-faced Whip Snake | *Demansia psammophis* |
| | Red-naped Snake | *Furina diadema* |
| | Black-bellied Swamp Snake | *Hemiaspis signata* |
| | Eastern Tiger Snake | *Notechis scutatus* |
| | Spotted Black Snake | *Pseudechis guttatus* |
| | Red-bellied Black Snake | *Pseudechis porphyriacus* |
| | Eastern Brown Snake | *Pseudonaja textilis* |
| | Eastern Small-eyed Snake | *Rhinoplocephalus nigrescens* |
| | Bandy Bandy | *Vermicella annulata* |

**MAMMALS**

| | | |
|---|---|---|
| Family Tachyglossidae - Echidna | | |
| | Echidna | *Tachyglossus aculeatus* |
| Family Dasyuridae - Dasyurids | | |
| | Dusky Antechinus | *Antechinus swainsonii* |
| | Brown Antechinus | *Antechinus stuartii* |
| | **Tiger Quoll** | ***Dasyurus maculatus*** |
| | **Common Planigale** | ***Planigale maculata*** |
| | **Brush-tailed Phascogale** | ***Phascogale tapoatafa*** |
| | Common Dunnart | *Sminthopsis murina* |
| Family Peramelidae - Bandicoots | | |
| | Northern Brown Bandicoot | *Isoodon macrourus* |
| | Long-nosed Bandicoot | *Perameles nasuta* |
| Family Phascolarctidae - Koala | | |
| | **Koala** | ***Phascolarctos cinereus*** |

| | | |
|---|---|---|
| Family Vombatidae - Wombats | | |
| | Common Wombat | *Vombatus ursinus* |
| Family Burramyidae - Pygmy Possums | | |
| | Eastern Pygmy Possum | *Cercatetus nanus* |
| Family Petauridae - Gliders | | |
| | Sugar Glider | *Petaurus breviceps* |
| ^ | **Squirrel Glider** | ***Petaurus norfolcensis*** |
| Family Pseudocheiridae - Ringtail Possums and Greater Glider | | |
| | Greater Glider | *Petauroides volans* |
| # | Common Ringtail Possum | *Pseudocheirus peregrinus* |
| Family Acrobatidae - Feathertail Glider | | |
| | Feathertail Glider | *Acrobates pygamaeus* |
| Family Phalangeridae - Brushtail Possums | | |
| # | Mountain Brushtail Possum | *Trichosurus caninus* |
| # | Common Brushtail Possum | *Trichosurus vulpecula* |
| Family Macropodidae - Kangaroos, Wallabies | | |
| | Eastern Grey Kangaroo | *Macropus giganteus* |
| | Red-necked Wallaby | *Macropus rufogriseus* |
| | Swamp Wallaby | *Wallabia bicolor* |
| Family Pteropodidae - Fruit Bats | | |
| | **Grey-headed Flying-fox** | ***Pteropus poliocephalus*** |
| | Little Red Flying-fox | *Pteropus scapulatus* |
| Family Rhinolophidae - Horseshoe-bats | | |
| | Eastern Horseshoe-bat | *Rhinolophus megaphyllus* |
| Family Emballonuridae - Sheathtail-bats | | |
| | **Yellow-bellied Sheathtail-bat** | ***Saccolaimus flaviventris*** |
| Family Molossidae - Freetail-bats | | |
| # | **East-coast Freetail-bat** | ***Mormopterus norfolkensis*** |
| | Eastern Freetail-bat | *Mormopterus* sp. |
| | White-striped Freetail-bat | *Nyctinomus australis* |
| Family Vespertilionidae - Plain-nosed Bats | | |
| # | Gould's Wattled bat | *Chalinolobus gouldii* |
| | Chocolate Wattled Bat | *Chalinolobus morio* |
| | **Little Bentwing-bat** | ***Miniopterus australis*** |
| | **Large Bentwing-bat** | ***Miniopterus schreibersii*** |
| | **Large-footed Myotis** | ***Myotis adversus*** |
| | Little Broad-nosed Bat | *Nycticeius greyii* |
| # | Lesser Long-eared Bat | *Nyctophylus geoffroyi* |
| | Gould's Long-eared Bat | *Nyctophilus gouldii* |
| | **Greater Broad-nosed Bat** | ***Scoteanax rueppellii*** |
| | Eastern Broad-nosed Bat | *Scotorepens orion* |
| | Large Forest Bat | *Vespadelus darlingtoni* |
| | Eastern Forest Bat | *Vespadelus pumilus* |
| | Southern Forest Bat | *Vespadelus regulus* |
| | Little Cave Bat | *Vespaledus vulturnus* |
| Family Muridae - Rodents | | |
| | Water Rat | *Hydromys chrysogaster* |
| | Grassland Melomys | *Melomys burtoni* |

| | | |
|---|---|---|
| | *House Mouse | *Mus musculus* |
| | Southern Bush Rat | *Rattus fuscipes* |
| | Swamp Rat | *Rattus lutreolus* |
| | *Brown Rat | *Rattus norvegicus* |
| | *Black Rat | *Rattus rattus* |
| | New Holland Mouse | *Pseudomys novaehollandiae* |
| Family Canidae | | |
| ^ | *Fox | *Vulpes vulpes* |
| # | *Dog | *Canis familiaris* |
| Family Felidae | | |
| # | *Cat | *Felis catus* |
| Family Leporidae | | |
| | *European Hare | *Lepus capensis* |
| # | *Rabbit | *Oryctolagus cuniculus* |
| Family Equidae | | |
| | *Donkey | *Equus asinus* |
| # | *Horse | *Equus caballus* |
| Family Bovidae | | |
| # | *Cow | *Bos taurus* |
| | *Goat | *Capra hircus* |

# APPENDIX D

# SIGNIFICANT TREE SURVEY

## SIGNIFICANT TREE SURVEY

A Significant Tree Survey has been undertaken on the site to identify trees on site likely to offer potentially suitable resources for native fauna. The field assessment involved GPS locational marking off selected trees, evaluation of the type of tree (species), and classification of the tree into one of various categories. Such included:

- **Class 1** – Trees with large sized hollows (potentially suitable for owls, cockatoos, large possums etc)
- **Class 2** – Trees with medium sized hollows (potentially suitable for gliders, rosellas etc.)
- **Class 3** – Trees with small sized hollows (potentially suitable for microchiropteran bats etc.)
- **Regionally Significant** – *Eucalyptus robusta* (Swamp Mahogany) trees
- **Other** – Trees noted as containing birds nests, or being utilised by arboreal animals during spotlighting.

Trees that occurred in the riparian strip area were generally not included in the Significant Tree Survey, as it is expected that such areas will be retained intact within a lakeside buffer zone.

| TREE NO. | CLASS | SPECIES |
|---|---|---|
| 1 | Reg.Sig. | *Eucalyptus robusta* |
| 2 | Reg.Sig. | *E.robusta* |
| 3 | Reg.Sig. | *E.robusta* |
| 4 | Reg.Sig. | *E.robusta* |
| 5 | Reg.Sig. | *E.robusta* |
| 6 | 1 | Dead tree with fig |
| 7 | 3 | *E. haemastoma* |
| 8 | 2 | *E. haemastoma* |
| 9 | 2 | *E. haemastoma* |
| 10 | 2 | *Angophora costata* |
| 11 | 2 | *A. costata* |
| 12 | 2 | *E. haemastoma* |
| 13 | 2 | Dead stag |
| 14 | 3 | *A. costata* |
| 15 | 2 | *E. haemastoma* |
| 16 | 2 | *E. haemastoma* |
| 17 | 1 | *A. costata* |
| 18 | 1 | *A. costata* |
| 19 | 1 | *A. costata* |
| 20 | 1 | *A. costata* |
| 21 | 1 | *E. haemastoma* |
| 22 | 1 | *A. costata* |
| 23 | 2 | *E. haemastoma* |
| 24 | 2 | Dead tree |
| 25 | 1 | *E. haemastoma* |
| 26 | 3 | Dead stump |
| 27 | 3 | Dead stump |
| 28 | Reg.Sig. | *E.robusta* |
| 29 | Other | *Eucalyptus sp.* |
| 30 | 3 | *A. costata* |
| 31 | 2 | *A. costata* |
| 32 | Reg.Sig. | *E.robusta* |
| 33 | Reg.Sig. | *E.robusta* |
| 34 | 3 | Dead tree |
| 35 | 3 | *E. tereticornis* |
| 36 | 3 | *A. costata* |
| 37 | 2 | *A. costata* |
| 38 | 3 | Dead stump |
| 39 | 2 | *E. tereticornis* |
| 40 | 3 | *E. tereticornis* |
| 41 | 2 | *E. tereticornis* |
| 42 | 3 | *E. tereticornis* |
| 43 | Other | *E. tereticornis* |
| 44 | 3 | *E. tereticornis* |
| 45 | 2 | *E. tereticornis* |

| TREE NO. | CLASS | SPECIES |
|---|---|---|
| 46 | 3 | *E. tereticornis* |
| 47 | 2 | *E. tereticornis* |
| 48 | 3 | *E. tereticornis* |
| 49 | 3 | *E. tereticornis* |
| 50 | 3 | *E. tereticornis* |
| 51 | 3 | *E. tereticornis* |
| 52 | 3 | *E. tereticornis* |
| 53 | 3 | *E. tereticornis* |
| 54 | Other | *Araucaria heterophylla* |
| 55 | 3 | *E. tereticornis* |
| 56 | 3 | *E. tereticornis* |
| 57 | 2 | *E. tereticornis* |
| 58 | 2 | Dead tree |
| 59 | 2 | *E. tereticornis* |
| 60 | Reg.Sig. | *E. robusta* |
| 61 | 1 | *A. costata* |
| 62 | 2 | *A. costata* |
| 63 | Other | *E. tereticornis* |
| 64 | 2 | Dead tree |
| 65 | 2 | *E. tereticornis* |
| 66 | 2 | *E. tereticornis* |
| 67 | 2 | Dead tree |
| 68 | 3 | *E. tereticornis* |
| 69 | 2 | *E. tereticornis* |
| 70 | 1 | *E. tereticornis* |
| 71 | 1 | *E. tereticornis* |
| 72 | 2 | Dead tree |
| 73 | 3 | *A. costata* |
| 74 | 2 | *E. haemastoma* |
| 75 | 1 | *A. costata* |
| 76 | 2 | *E. tereticornis* |
| 77 | 3 | *E. tereticornis* |
| 78 | 3 | *A. costata* |
| 79 | 3 | *A. costata* |
| 80 | 2 | *A. costata* |
| 81 | 2 | Dead tree |
| 82 | 3 | *E. haemastoma* |
| 83 | 3 | Dead tree |
| 84 | 3 | *A. costata* |
| 85 | 3 | Dead tree |
| 86 | 3 | *A. costata* |
| 87 | 2 | *E. haemastoma* |
| 88 | 3 | *E. haemastoma* |
| 89 | 2 | *E. haemastoma* |
| 90 | 3 | *A. costata* |
| 91 | 1 | *A. costata* |

| TREE NO. | CLASS | SPECIES |
|---|---|---|
| 92 | 2 | *E. haemastoma* |
| 93 | 3 | *A. costata* |
| 94 | 3 | *A. costata* |
| 95 | 2 | Dead stag |
| 96 | 2 | *E. haemastoma* |
| 97 | 2 | *A. costata* |
| 98 | 3 | *A. costata* |
| 99 | 1 | *A. costata* |
| 100 | 2 | Dead stump |
| 101 | 2 | Dead stag |
| 102 | 3 | *E. haemastoma* |
| 103 | 2 | *A. costata* |
| 104 | 3 | *A. costata* |
| 105 | 2 | Dead stag |
| 106 | 3 | *A. costata* |
| 107 | 2 | *E. haemastoma* |
| 108 | 2 | *A. costata* |
| 109 | 3 | *E. tereticornis* |

# APPENDIX C HSO (2003) Supplementary Survey Report

HARPER SOMERS O'SULLIVAN

Land . Ecology . Environment . Solutions

# SUPPLEMENTARY ECOLOGICAL REPORT

**FOR**

**PROPOSED RESIDENTIAL DEVELOPMENT**

**OF LAND OFF**

**MORRISET PARK ROAD**
**MORRISET PARK**

***Prepared for Kendall Grange Properties Pty. Ltd.***

**November 2003**

**Prepared by:**

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## 1.0 BACKGROUND

It is proposed to undertake residential development over a parcel of land off Morriset Park Road, Morriset Park. The land is zoned 2(a), and is the northwestern section of a larger parcel of land known as the 'St. John of God Site'.

Several phases of Flora and Fauna Assessment have been undertaken over a two year period throughout the entire St. John of God site, including during the initial site investigation, constraints and opportunities identification phase, conceptual planning, design refining, and ultimately onto design finalisation and application submission stage.

Such assessment has included:

> Harper Somers (2001). *Flora and Fauna Assessment for proposed rezoning of various lots off Henry Street, Morriset Park.* Report prepared for Kendall Grange Properties Pty. Ltd. August 2001.
>
> HSO Ecology (2002). *Addendum to Flora and Fauna Assessment – Henry Street, Morriset Park.* Report prepared for Kendall Grange Properties Pty. Ltd. October 2002.
>
> HSO Ecology (2003). *Eight Part Test for Proposed Residential Development of Land off Morriset Park Road, Morriset Park.* Report prepared for Kendall Grange Properties Pty. Ltd. August 2003.

The above reports have been reviewed by Council as the project has developed. Most recently, the Eight Part Test Report (2003) has been reviewed in relation to the submitted application for residential development over the existing 2(a) zoned lands. In response to this report, Council's Flora and Fauna Planner requested that additional stagwatching and other survey methods be applied to the remnant habitat trees occurring within the 2(a) lands.

This report details the additional works undertaken in this regard, and the results obtained.

A plan showing the extent of 2(a) lands in relation to the wider St. John of God site is presented overleaf.


LAKEVIEW ROAD
2(a)
MORISSET ROAD
2 (a)
5 (a)
HENRY ROAD
N

## 2.0 METHODS

The hollowing bearing trees present were identified in previous reports as being utilised by a variety of nesting avifauna (albeit fairly common species), and also as being potentially suitable for use by a range of other fauna species.

To supplement the survey works already undertaken to date as components of previous reports in relation to these trees (including arboreal trapping, stagwatching, spotlighting, scanning with binoculars, searches for secondary indications of usage such as scats, scratches on boles, whitewash, regurgitation pellets etc), the following approach was applied on site.

The site was surveyed on Wednesday 12th November 2003, with weather conditions being clear, warm and still. Survey began at 5:15pm and went through until 9:40pm.

### 2.1 Diurnal Searches

Searches were made under every hollow bearing tree on site for any signs of whitewash, regurgitation pellets, prey remains, feathers, nesting material etc as evidence of usage by owl species, particularly targeting *Tyto novaehollandiae* (Masked Owl), *Ninox strenua* (Powerful Owl) and *Ninox connivens* (Barking Owl). Such searches were conducted as radiating circles around trees, beginning as a tight circumnavigation of the base of a tree, and slowly widening the circle until the edge of the canopy extent was reached. Searched were in the order of 2-5 minutes per tree, depending on tree size (canopy extent), groundcover characteristics, and types of finds.

Note was also made of scratches on boles of trees in relation to potential usage by animals such as *Petaurus norfolcensis* (Squirrel Glider) at the commencement of each circumnavigation.

Any other signs of fauna either within trees or within visible hollows were noted. Scanning of trees from close proximity and from a distance with binoculars was utilised in this regard. Particular attention was paid to ledges and perches on or near hollows for signs of fauna usage.

Any general evidence of fauna observed on the ground beneath trees (such as scats) was all noted.

All of the above effort was undertaken in a period of 1.25 hours.

### 2.2 Stagwatching

Stagwatching of hollows on the site was undertaken from late afternoon, through dusk, and on into total darkness. Stagwatching involved both stationary periods and quiet movement between vantage points where several hollows could be surveyed. Binoculars were utilised to check any possible movements, and where possible a vantage point was chosen that enabled fading light in the west to be utilised to highlight silhouette movement.

Stagwatching was undertaken in this regard for a period of 1.5 hours.

### 2.3 Spotlighting

Following on from stagwatching, spotlighting was undertaken throughout the entire site in a circular roaming pattern that provided traversal of the site for five (5) passes.

A 'Lightforce' spotlight (75w) was utilised, which provided a light beam powerful enough to illuminate trees at the far end of the site. On occasion, the spotlight was turned off with the operator remaining quiet and stationary, and then beamed at areas where noise could be heard as fauna moved within the trees. Spotlighting was undertaken for 1.5 hours.

### 2.4 Auditory Survey

Two forms of Auditory Survey were employed during the survey, being owl call broadcasting, and imitation of distressed prey.

Owl call broadcasting was undertaken with the aid of a 'Powerhorn' megaphone (10 watts) and tape player. It is considered that the calls would have been audible for over 1km away, given the still conditions and absence of any other prevailing noise sources of note in this locality. Calls of *Tyto novaehollandiae* (Masked Owl), *Ninox strenua* (Powerful Owl) and *Ninox connivens* (Barking Owl) were broadcast separately, followed by 3 minute periods of quiet listening following each call. Upon completion of final calls, spotlighting was undertaken throughout the entire site via a circular traversal. Calls were broadcast from the central southern area of the site due the slightly higher elevation facilitating call carry.

Imitation of distressed prey involved rubbing a piece of glass on polystyrene, which produces a sound not dissimilar to a distressed bird or small mammal. This was undertaken in the midst of the habitat tree zone on two occasions, being at the completion of stagwatching before spotlighting commenced, and following on from completion of owl call broadcasting.

## 3.0 RESULTS

### 3.1 Diurnal Searches

Results of note obtained by diurnal searches included:

- Fauna observed on site that are known to breed in hollows included *Chenonetta jubata* (Wood Duck), *Cacatua galerita* (Sulphur-crested Cockatoo), *Platycercus eximius* (Eastern Rosella), *Cacatua tenuirostris* (Long-billed Corella), *Cacatua roseicapilla* (Galah), *Trichoglossus haematodus* (Rainbow Lorikeet), *Dacelo novaeguineae* (Kookaburra), *Eurystomus orientalis* (Dollarbird), *Acridotheres tristis* (Common Myna).

- Fauna species observed utilising hollows included *Cacatua galerita* (Sulphur-crested Cockatoo) (one pair), *Cacatua tenuirostris* (Long-billed Corella) (one pair), *Cacatua roseicapilla* (Galah) (three pairs). Neighbours also informed that *Dacelo novaeguineae* (Kookaburra) (one pair) nest on the site. (The findings above are consistent with previous observations on the site).

- Feathers located beneath trees were consistent with *Chenonetta jubata* (Wood Duck), *Cacatua galerita* (Sulphur-crested Cockatoo), *Cacatua roseicapilla* (Galah) and *Cacatua tenuirostris* (Long-billed Corella).

- Perching birds of the above species and others such as *Artamus cyanopterus* (White-breasted Woodswallow), *Gymnorhina tibicen* (Australian Magpie) and *Coracina novaehollandiae* (Black-faced Cuckoo-shrike) were noted commonly.

- Some minor whitewash was observed under some hollow edges and nearby limbs, and was considered consistent with the species listed above. Copious whitewash areas were absent, as were other secondary indications consistent with owls.

- Scats were occasionally encountered under trees, and were consistent with *Trichosurus vulpecula* (Common Brushtail Possum).

- Scratches on several smooth-barked trees on site were consistent with *Trichosurus vulpecula* (Common Brushtail Possum).

- Feral bees were observed to be occupying two hollows on site.

### 3.2 Stagwatching

Stagwatching revealed the presence of emerging *Trichosurus vulpecula* (Common Brushtail Possum), and several species of birds roosting (as listed above).

A small number of microbats were observed hunting around the remnant trees.

A single *Pteropus poliocephalus* (Grey-headed Flying-fox) was observed flying into a neighbouring backyard garden, and thereafter was occasionally heard foraging within the mix of exotic and native trees present in the backyard. *P. poliocephalus* is a Vulnerable species listed under state and national legislation; however the seasonal foraging presence of this species was predicted within previous reports, and assessments have shown that the resources present on site are not likely to be significant in this locality for this species.

### 3.3 Spotlighting

Spotlighting revealed numerous *Trichosurus vulpecula* (Common Brushtail Possum), with at least half of the trees on site harbouring individuals or pairs of this species.

A small owl that was tentatively identified as a *Ninox novaeseelandiae* (Southern Boobook) was observed wheeling over the vegetated backyard areas immediately south of the site, before flying off to the west towards the forest habitat within the Lake Macquarie SRA. This identification was confirmed a few minutes later when the audible calling of this species began from this area.

A *Vulpes vulpes* (Fox) was also spotlighted in the act of sneaking up on roosting *Vanellus miles* (Masked Lapwings), who took to the air and proceed to dive bomb the retreating offender.

### 3.4 Auditory Survey

There were no replies to either the owl call broadcasts or the distressed prey imitations.

As mentioned above, a *Ninox novaeseelandiae* (Southern Boobook Owl) was heard calling from the SRA to the west of the site.

## 4.0 CONCLUSION

As requested by Council, additional targeted surveys have been carried out in relation to habitat trees occurring within the 2(a) lands proposed to be developed for residential purposes.

The survey work utilised a combination of methods including diurnal searches, stagwatching, spotlighting and auditory techniques. The techniques were primarily targeted at threatened forest owls, but also facilitated the potential detection of Squirrel Gliders and other fauna species in general.

No sign of any threatened forest owls could be found during the survey, Similarly, no sign of Squirrel Gliders was found.

The only fauna species observed utilising hollows on the site were relatively common native bird species that had been identified utilising hollows during previous surveys.

The additional survey undertaken has clarified the findings of previous surveys and assessments, and the submitted Eight Part Tests are still considered relevant and applicable to the development as proposed.

## 6.0 REFERENCES:

Forest Fauna Surveys Pty Ltd & Eastcoast Flora Surveys (2001).. *Flora and Fauna Survey Guidelines – Version 2.0.* Prepared for Lake Macquarie City Council. July 2001.

Harper Somers (2001). *Flora and Fauna Assessment for proposed rezoning of Various Lots off Henry Street, Morriset Park.* Report to Kendall Grange Properties Pty. Ltd. August 2001.

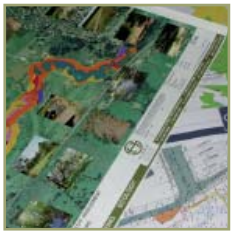
Harper Somers O'Sullivan (2002). *Addendum to Flora and Fauna Assessment – Henry Street, Morriset Park.* Report to Kendall Grange Properties Pty. Ltd. October 2002.

Harper Somers O'Sullivan (2003). *Eight Part Test for Proposed Residential Development of Land off Morriset Park Road, Morriset Park.* Report prepared for Kendall Grange Properties Pty. Ltd. August 2003.

Pizzey, G. and Knight, F. (1999). *Field Guide to the Birds of Australia*. Angus and Robertson, Sydney. Second Edition.

Triggs, B. (1996). *Tracks, Scats and Other Traces: a Field Guide to Australian Mammals*. Oxford University Press, Australia.

# APPENDIX D RPS HSO (2007) Terrestrial Ecological Assessment Report



# Terrestrial Ecological Assessment

Final Report
For the Proposed Trinity Point Marina
Trinity Point NSW

Prepared for
Johnson Property Group Pty Ltd
Po Box A1308
Sydney South NSW 1235

Job Reference 24107 - December 2007

HARPER SOMERS O'SULLIVAN
PLANNING · SURVEYING · ECOLOGY
A member of RPS Group Plc

# Flora & Fauna Assessment

For the

Proposed Trinity Point Marina

FINAL REPORT

TRINITY POINT, NSW

*Prepared for*

JOHNSON PROPERTY GROUP PTY LTD

**Job Reference No: 20970 – December 2007**


***PREPARED BY:***
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| | |
|---|---|
| PROJECT: TERRESTRIAL ECOLOGICAL ASSESSMENT – TRINITY POINT MARINA | |
| CLIENT: | JOHNSON PROPERTY GROUP PTY LTD |
| OUR REF | 20970 |
| DATE: | DECEMBER 2007 |
| APPROVED BY: | ANNA MCCONVILLE |
| SIGNATURE: | |
| CHECKED BY: | TOBY LAMBERT |
| SIGNATURE: | |

# EXECUTIVE SUMMARY

## INTRODUCTION

RPS Harper Somers O'Sullivan (RPS HSO) has been commissioned by Johnson Property Group to undertake a Terrestrial Ecological Assessment for the development of land at Trinity Point, Morisset Park, Lake Macquarie, NSW. The proposal is to be assessed under Part 3A of the *Environmental Planning and Assessment Act 1979*. The development project is referred to as 'Trinity Point Marina'.

The study area is located on the foreshore of the Morisset Park peninsula, surrounded by Lake Macquarie and includes lands previously occupied by St. John of God. The subject site assessed within this Terrestrial Ecological Assessment report (referred to as 'the site') is a smaller area that extends to the high water mark of Lake Macquarie and west to the edge of the proposed development.

The development of the Terrestrial Ecological Assessment for Trinity Point Marina comprises the following aspects:

- **Collation and review of existing flora and fauna datasets and survey reports** – Five previous flora and fauna investigation and assessment reports undertaken by HSO (2004; 2003a; 2003b; 2002; and 2001) were reviewed as part of this ecological assessment. Additionally the NPWS Atlas of NSW Wildlife and BioNet databases were searched for threatened species records within 10 km of the site. An EPBC Act Protected Matters Search within 10 km of the site was consulted.

- **Vegetation survey & mapping datasets** – The vegetation assessment included a review of the Lower Hunter Central Coast Regional Environmental Management Strategy (LHCCREMS) regional vegetation mapping (House, 2003) and finer scale vegetation survey and mapping that was undertaken by HSO (2001). A site inspection was undertaken to verify the vegetation community mapping previously undertaken.

- **Threatened species surveys and habitat investigations –** Targeted surveys for threatened flora and fauna species considered likely to occur within the site were undertaken as part of previous investigations (HSO, 2001). Further threatened species habitat assessment has been undertaken as part of this ecological assessment report using information presented in HSO (2001; 2003b; 2004) and collected during the site inspection.

- **Site inspection** - A site inspection was undertaken by an RPS HSO Ecologist on 23 October 2007 to verify previous vegetation mapping and to assess the current condition and habitat values of the site.

## FLORA

The flora survey methodology consisted of a combination of quadrats, transects, random meanders and targeted searches for threatened flora species considered likely to occur within the site. Three vegetation communities were found within the site: remnant Eucalypt Woodland with grassy understorey; Open Pasture consisting largely of grasses and herbaceous weeds; and Riparian Vegetation consisting of a succession from the waters edge of mangroves, saltmarsh and ultimately, Swamp Oak Forest.

No threatened flora species were recorded during investigations or were considered likely to occur within the site. Two EECs were found within the site including highly degraded River

Flat Eucalypt Forest consisting only of scattered remnant Rough-barked Apple and Forest Red Gum, and Swamp Oak Floodplain Forest on the lake edge.

**FAUNA**

Methods employed targeting fauna species included:

- fauna habitat assessment;
- significant tree survey;
- terrestrial mammal trapping;
- arboreal mammal trapping;
- bat call detection (Anabat II detector);
- avifauna survey (diurnal and nocturnal surveys);
- herpetofauna surveys;
- spotlighting;
- secondary indications and incidental observations.
- stagwatching of hollows;
- call playback of the Masked Owl (*Tyto novaehollandiae*), Powerful Owl (*Ninox strenua*) and Barking Owl (*N. connivens*); and
- hollow-bearing tree survey.

Fauna habitat within the site was found to be limited to remnant trees and riparian vegetation. Winter flowering tree species recorded within the site include Forest Red Gum, which may provide foraging resources for nectarivorous bird and mammal species. Additionally, figs (*Ficus* sp.) located within the southern portion of the site are likely to provide some foraging habitat for frugivorous species such as the Grey-headed Flying Fox.

No hollow-bearing trees were recorded within the site; however, adjacent areas within the broader St. John of God site were found to contain trees with a variety of hollow size classes. During the recent site inspection, three mature Forest Red Gums that would represent foraging habitat for a number of fauna species were recorded within the central portion of the proposal footprint.

Fauna species recorded within the site were limited to common species able to persist in open, disturbed habitats.

One threatened fauna species was recorded within the site during surveys, the Eastern Freetail Bat (*Mormopterus norfolkensis*) and seven other threatened fauna species were considered likely to occur within the site:

- Osprey (Pandion haliaetus);
- Swift Parrot (Lathamus discolor);

- Grey-headed Flying Fox (Pteropus poliocephalus);
- Eastern Bentwing Bat (Miniopterus schreibersii);
- Little Bentwing Bat (Miniopterus australis);
- Large-footed Myotis (Myotis adversus); and
- Greater Broad-nosed Bat (Scoteanax ruepelli).

## ECOLOGICAL IMPLICATIONS OF THE PROPOSAL

The proposed development footprint would require the modification of a small number (<10) of Forest Red Gum (*Eucalyptus tereticornis*), Melaleuca and Swamp Oak trees. These trees comprise a highly disturbed exampled of endangered riparian vegetation.

It is understood that an area of vegetation including an historic Norfolk Island Pine (*Araucaria heterophylla*), a number of Figs (*Ficus* sp.) and Cabbage Tree Palm (*Livistona australis*) in the south of the subject site would not be removed as a result of the proposal.

The removal or modification of foraging habitat (vegetation) for threatened fauna species recorded or considered likely to occur within the site is considered a minor impact considering the proportion of habitat available in the local area, the highly mobile nature of the species and the small amount of foraging habitat to be removed within the site.

## ENVIRONMENTAL LEGISLATION ASSESSMENT

### *Section 3A of the EP&A Act 1979 Key Thresholds Assessment*

The Key Thresholds Assessment concluded that the potential impacts arising from the proposed Trinity Point Marina on threatened fauna species recorded or considered likely to occur within the site are of a small scale and magnitude. The proposal is considered unlikely to adversely impact on threatened fauna species recorded or considered likely to occur within the site.

### *SEPP 44 'Koala Habitat Protection'*

Harper Somers O'Sullivan (2001) found that the site and adjacent areas represented 'Potential Koala Habitat' as defined by SEPP 44. Within the site, Forest Red Gum (*Eucalyptus tereticornis*) is the only Schedule 2 Koala feed tree.

Direct searches of Koala within the site included spotlighting and diurnal searches. Indirect searches for evidence of Koala included searches for scats and scratches on tree trunks, particularly targeting primary browse species. No evidence of Koala was found within the site and no individuals were observed (HSO, 2001; 2003b).

The most recent local Koala records are from 1997 near Morisset and from 1996 at Mannering Park (Atlas of NSW Wildlife data). Historical records that exist within 10 km of the study area include:

- 1950's on Pulbah Island in Lake Macquarie
- 1986 from Wangi Point

A lack of recent Koala records from the local area indicate that the local Koala population, should it exist, it is likely to be at very low density.

Whilst the site offers potential Koala habitat, the lack of recent records combined with no evidence of Koala within the site indicates that a resident Koala population is unlikely to occur. As a result the site was not considered to constitute core Koala habitat under SEPP 44 and no further provisions of SEPP 44 apply to the site.

### EPBC Act 1999

A total of 25 nationally listed threatened species under the *EPBC Act 1999* have been recorded within the proximate region of the study area. It is considered unlikely the current proposal will have a significant impact upon local populations of Commonwealth listed threatened and Migratory species such that local extinctions would occur. As such, it is unlikely to be a controlled action and thus referral to the Department of Environment and Water Resources is not necessary.

## RECOMMENDATIONS

The potential impacts arising from the proposed Trinity Point Marina on threatened species, populations and/or endangered ecological communities listed under TSC Act and/or EPBC Act are considered to be minimal. However, a number of mitigation measures could be implemented to further reduce potential impacts. Recommended mitigation measures are:

- Retain Forest Red Gums (*Eucalyptus tereticornis*) within the proposal footprint where possible (with regard for public safety). Selective lopping of limbs to stabilise trees should be considered in consultation with a qualified arborist.

- Minimise potential impacts associated with erosion and sedimentation on adjacent sensitive communities (ie Saltmarsh and riparian vegetation) and Lake Macquarie during construction through the inclusion of appropriate erosion and sediment controls in a Construction Environmental Management Plan (CEMP).

- Adopt recommendations made by The Ecology Lab to minimise impacts on the aquatic environment and associated communities (ie mangroves and saltmarsh).

- Minimise potential impacts arising from stormwater runoff into adjacent riparian areas (Saltmarsh and Swamp Oak Floodplain Forest EECs) and Lake Macquarie by designing and installing appropriate stormwater detention and/or filtering devices.

- Undertake riparian enhancement utilising native species from local seed stock and minimising soil disturbance.

- Remove Camphor Laurel (Class 4 Noxious Weed) in the east of the site.

# GLOSSARY OF TERMS

DBH – Diameter at Breast Height

DCP – Development Control Plan

DECC – NSW Department of Environment and Climate Change (formerly NSW National Parks and Wildlife Service, NSW Department of Environment and Conservation)

DEW - Commonwealth Department of Environment and Water Resources

DGRs - Director-General's Requirements

EEC - Endangered Ecological Community

EP&A Act – NSW *Environmental Planning & Assessment Act 1979*

EPBC Act – Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

GPS – Global Positioning System

ha – hectare

HBOC – Hunter Bird Observers Club

LEP – Local Environmental Plan

LGA – Local Government Area

LHCCREMS - Lower Hunter and Central Coast Regional Environmental Management Strategy

LHRCP – Draft Lower Hunter Regional Conservation Plan

LHRS – Lower Hunter Regional Strategy

ROTAP – Rare or Threatened Australian Plants listed by Briggs and Leigh (1996)

RPS HSO – RPS Harper Somers O'Sullivan

SF – State Forest

Site – the site subject to this Terrestrial Ecological Assessment Report

ssp. / subsp. – sub-species

Study area – the entire St. John of God lands

TSC Act – NSW *Threatened Species Conservation Act 1995*

# CONTENTS

# 1. INTRODUCTION

RPS Harper Somers O'Sullivan (RPS HSO) has been commissioned by Johnson Property Group to undertake a Terrestrial Ecological Assessment for the development of land at Trinity Point, Morisset Park, Lake Macquarie, NSW. The proposal is to be assessed under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The development project is referred to as 'Trinity Point Marina'.

This report deals specifically with the suite of potential impacts on terrestrial ecology as a result of the proposal to rezone the land to incorporate a marina and mixed use resort. It has been prepared with due reference to the Draft Guidelines for Threatened Species Assessment (DEC/DPI, 2005) as relates to Part 3A applications.

The 'study area' is located on the foreshore of the Morisset Park peninsula, surrounded by Lake Macquarie (Figure 1-1). The study area includes lands previously occupied by St. John of God, whilst the 'subject site' that is addressed within this Terrestrial Ecological Assessment report is a smaller area that extends to the high water mark of Lake Macquarie and west to the edge of the proposed development (Figure 1-2).

This report considers the requirements of the Director General of Planning (DGRs) as set down for this project (attached as Appendix A). It includes the likelihood of the proposal to have a significant effect on any threatened species, populations or Endangered Ecological Communities (EECs) listed within the *Threatened Species Conservation Act 1995* (TSC Act 1995). The report recognises the relevant requirements of the EP&A Act 1979 as amended by the EP&AA Act 1997. Consideration of potential constraints has also been undertaken in relation to the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999).

Specific information pertaining to the ecology of the site has been documented previously by HSO (2001; 2003b). These reports combined with a recent site inspection to verify and update findings were been used as the ecological dataset upon which assessments have been based within this report. These reports have been appended to this assessment report as Appendices C and D.

## 1.1 Site Particulars

**Locality –** Morisset Park peninsula on the shore of Lake Macquarie, NSW.

**LGA –** Lake Macquarie.

**Title(s) –** Lot 38 DP 755242

**Area –** Approximately 5.2 ha

**Current Zoning –** 5(a) Special Uses

**Boundaries –** The subject site is bounded to the north, south and east by the high tide mark of Lake Macquarie and to the west by the remainder of land formerly owned by St. John of God. Residential development within Morisset Park exists further to the west.

**Current Land Use –** The subject site is currently unoccupied open space. Formerly the site was used as the St. John of God Training Centre and contained training centre buildings, associated facilities, open space, pasture and vacant lands. However, the training centre buildings and facilities have since been demolished.

**Topography -** Generally the subject site is gently sloping towards the water on all sides from the central to southern plateau, which continues to rise offsite to the west. Southern portions of the site contain a steep drop-off to the water via a sandstone cliff face up to approximately 8m in height.

**Vegetation –** The subject site consists mainly of cleared pasture with small areas of remnant Eucalypt Woodland and some exotics surrounding former building site. Some lakeside fringing riparian vegetation also remains.

## 1.2 Description of the Proposal

The Trinity Point Marina proposal consists of the breakwater, marina, associated boat maintenance facilities (travel lift, hardstand and workshop), helipad and other associated infrastructure such as cafe, restaurant and function facilities. A six level tower is also proposed for tourist accommodation. Figure 1-3 shows the proposal plan.

## 1.3 Scope of the Study

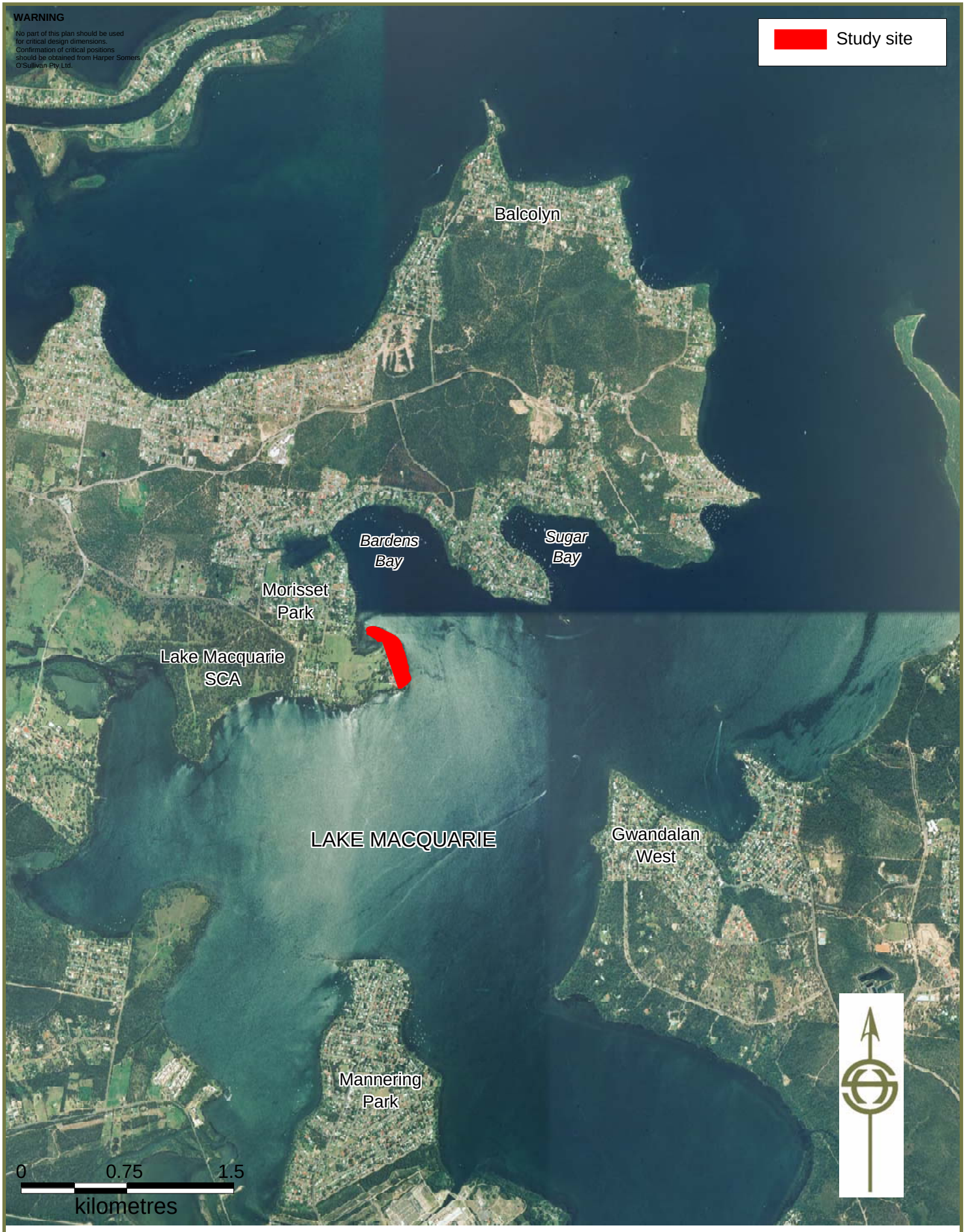
This study was designed to incorporate the results of detailed ecological inventories previously undertaken across the site. This report aimed to:

- identify as many plant species found within the site as possible;
- verify the vegetation communities within the subject site;
- assess the conservation status of the vegetation communities present;
- locate and map the occurrence of any threatened plant species and their habitat;
- identify the various habitat types present;
- assess the suitability of the habitat(s) present for native species in general;
- assess the habitat(s) present against the specific requirements of threatened species known from the locality;
- identify as many fauna species as possible that are using the site via application of targeted field survey techniques;
- identify other fauna species, particularly threatened species, that may use the site; and
- address the possibility of the site, or parts thereof, being significant for any threatened species, populations or ecological communities.

This Terrestrial Ecological Assessment Report incorporates the above scope to enable informed assessments to be made regarding potential ecological impacts as a result of the proposal, and if necessary, provide appropriate recommendations to reduce any significant impacts on threatened flora and fauna and / or EECs.

This study has been structured on the guidelines laid down in the EP&A Act 1979, which requires consideration of the impact of the proposed development upon any protected fauna but particularly on 'threatened' species (collective term for Schedule 1 – Endangered, and Schedule 2 – Vulnerable species as listed in the TSC Act 1995), Endangered Populations or EECs expected or occurring within the site. Consideration of potential constraints has also been undertaken in relation to the Commonwealth EPBC Act 1999.

Figure 1-1 shows the location of the study area in a regional context, Figure 1-2 shows the location and aerial photograph of the study area and subject site in local context, whilst Figure 1-3 shows the proposal.




TITLE:
Figure 1-1
ECOLOGICAL ASSESSMENT
LOCALITY

CLIENT: JOHNSON PROPERTY GROUP PTY LTD

PLANNING SURVEYING ECOLOGY

SCALE: 1: 30000 at A4 Size
DRAWN: AM
APPROVED:
DATUM: MGA Zone 56 (GDA 94)
DATE: 5/11/2007
LAYOUT REF: J:\JOBS\20x\20970 - Trinity Point\Marina & Resort - 2007\MapInfo\20970_Figure1-1_LocalityMGA.A.A4.wor
CONTOUR INTERVAL: N/A
JOB REF: 20970



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