

4.3 FAUNA SURVEY

4.3.1 TERRESTRIAL MAMMALS

No terrestrial mammals were captured during the fauna survey. This result was not surprising, given the paucity of groundcover over the majority of the site.

The only terrestrial mammals observed on site were introduced species such as:

- Rabbits (*Oryctolagus cuniculus*) which were foraging on site and residing in a large refuse pile of dead vegetation and rubbish.
- Cows (*Bos taurus*) and a Horse (*Equus caballus*) which are adgisted on site.
- Domestic Dogs (*Canis familiaris*) and Cats (*Felis catus*) were also observed on the site.
- A Fox (*Vulpes vulpes*) was also reported from the site (M. Cookson - surveyor, pers.comm).

4.3.2 ARBOREAL MAMMALS

Arboreal mammal trapping on site revealed several Common Brushtail Possums (*Trichosurus vulpecula*), including an individual specimen which was captured in the same trap three days in a row. Spotlighting also revealed a singular Common Ringtail Possum (*Pseudocheirus peregrinus*), several other specimens of *T. vulpecula*, and other Brushtail Possums that appeared more consistent with Mountain Brushtail Possums (*Trichosurus caninus*) due to larger size, darker fur colour and shorter, rounder ears.

Personal communication from an adjacent resident (north-western boundary), Ms. Joanne Foster, indicates that a Squirrel Glider (*Petaurus norfolcensis*) was entangled on a barbed wire fence of the property approximately two years ago. The glider was taken into care by the Native Animal Trust Fund (Ms. Lynn Wells, Dora Creek), and verified as a specimen of *P. norfolcensis*. Ms. Foster also claims that she has heard Squirrel Gliders calling from the trees in the western sector of the site. *P. norfolcensis* is known from the Lake Macquarie SRA areas (Kathleen Straw, NPWS Ranger. pers.comm), part of which occurs approximately 200m west of the site boundary. However, despite arboreal trapping and spotlighting effort, no definitive sign of gliders on site has been able to be obtained by this survey.

4.3.3 BATS

Bat detecting and visual observations on the site have revealed the presence of potentially at least three species of bats utilising the site. These species included:

- Gould's Wattled Bat (*Chalinolobus gouldii*), which was a confident identification by echolocation call analysis. Calls analysed corresponded with visual observations of many specimens of this bat before dusk. "They often emerge just after sunset when there is still a lot of ambient light" (Churchill, 1998). Given the presence of this species in numbers at a time of ample ambient light, it is likely that these bats are roosting in the immediate vicinity. "They prefer to roost in tree hollows, amongst leaves and in buildings" (Churchill,

1998).

- Lesser Long-eared Bat (*Nyctophilus geoffroyi*), which was a probable identification by call analysis. These bats prefer to roost in tree hollows, under peeling bark or in old buildings.
- East-coast Freetail-bat (*Mormopterus norfolkensis*), which was a possible identification by echolocation call analysis. These bats prefer to roost in tree hollows or in old buildings.

Mormopterus norfolkensis is a threatened species listed within the TSC Act schedules. Further consideration of this species is undertaken in Section 5.

4.3.4 AVIFAUNA

Avifauna species noted on site during fieldwork consisted of a variety of species expected to occur in the types of habitat present. Some sightings / reportings of note included:

- Wood Ducks (*Chenonetta jubata*) investigating several hollows for potential nesting sites. Another pair of Wood Ducks were noted as having four ducklings in tow.
 - Whistling Kite (*Haliastur sphenurus*) hawking over the site. Local resident Ms. Joanne Foster indicated that this species has been consistently nesting in large Eucalypt trees in the western portion of the site for over twenty years.
 - White-breasted Sea-Eagle (*Haliaeetus leucogaster*) is also occasionally seen over and around the site (Local Resident, name unknown, *pers.comm*).
 - Galahs (*Cacatua roseicapilla*) were noted occupying a hollow on site, and have been observed utilising such hollows in previous years (Joanne Foster, *pers.comm*).
 - Long-billed Corellas (*Cacatua tenuirostris*) pairs were noted occupying two separate hollows in the western portion of the site.
 - Yellow-tailed Black-Cockatoos (*Calyptorhynchus funereus*) have been noted in the area (Joanne Foster, *pers.comm*).
 - Scaly-breasted Lorikeets (*Trichoglossus chlorolepidotus*) were observed occupying a hollow in the south-western portion of the site.
 - Rainbow Lorikeets (*Trichoglossus haematodus*) and Laughing Kookaburras (*Dacelo novaeguineae*) have been observed occupying hollows on site in previous years (Joanne Foster, *pers.comm*).
 - Superb Fairy Wrens (*Malurus assimilis*), Yellow Thornbills (*Acanthiza lineata*) and a Satin Bowerbird (*Ptilinorhynchus violaceus*) were often noted in the Riparian Casuarina Forest.
 - White-breasted Woodswallows (*Artamus leucorhynchus*), Fairy Martins (*Cecropis ariel*), Tree Martins (*Cecropis nigricans*) and Welcome Swallows (*Hirundo neoxena*) were all commonly noted chasing insects within the open paddock areas.
 - Avifauna noted in estuarine areas adjacent to the site included species such as Black Swan (*Cygnus atratus*), Cormorants (*Phalacrocorax* spp.), Australian Pelican (*Pelecanus conspicillatus*), Intermediate Egret (*Ardea intermedia*), Little Egret (*Egretta garzetta*), Royal Spoonbill (*Platalea regia*), Silver Gull (*Larus novaehollandiae*), and Crested Tern (*Sterna bergii*).
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No nocturnal birds were noted during the survey. No replies were heard to any of the owl call broadcasts.

A full list of avifauna species observed / reported on site during fieldwork is indicated in the Expected Fauna Species List in Appendix C.

4.3.5 HERPETOFAUNA

In general, conditions were not considered ideal for detecting herpetofauna species during the survey period, given the timing in late winter. However, it is important to note:

- The late winter timing of the survey is considered ideal for detection of the Wallum Froglet (*Crinia tinnula*), which was considered the only threatened herpetofauna species with any real chance of occurrence on site. This species "calls from May to September" (Robinson, 1996).
- The vast majority of the site is considered generally unsuitable for herpetofauna (other than common species) due to the modified vegetation communities present.

Frog species identified on the site during the survey included:

- Common Eastern Froglet (*Crinia signifera*), which was heard calling from all of the dams on the site both diurnally and nocturnally.
- Spotted Grass Frog (*Limnodynastes tasmaniensis*) was heard calling from the dam in the central northern part of the site during nocturnal investigations. A specimen of this frog was subsequently captured, which confirmed the call identification.
- Dwarf Tree Frog (*Litoria fallax*), which was heard calling from the landscaped garden area on a single occasion during the day.

Reptile species identified on site during the survey included:

- Specimens of Grass Skink (*Lampropholis delicata*) and Garden Skink (*L. guichenoti*) were occasionally observed, predominantly around the buildings and landscaped garden areas.
- A single specimen of Three-toed Skink (*Saiphos equalis*) was uncovered beneath part of the large vegetation refuse pile in the southern portion of the site.

5.0 THREATENED SPECIES ASSESSMENT

Threatened species known from the locality via NPWS Database records (within 10km) and other sources are considered below for their potential to be a subject species for this site.

5.1 IDENTIFICATION OF SUBJECT SPECIES

SPECIES	COMMENTS
Plants	
<i>Acacia bynoeana</i> – A Wattle	Not found during flora survey. Clearing and grazing would have lessened any chance of occurrence on site.
<i>Angophora inopina</i> – A Eucalypt	Not found during flora survey. Clearing and grazing would have lessened any chance of occurrence on site.
<i>Caladenia tessellata</i> – A Spider Orchid	Not found during flora survey. Habitat present not favoured. Clearing and grazing would have further lessened any chance of occurrence.
<i>Callistemon linearifolius</i> – A Bottlebrush	Not found during flora survey. Clearing and grazing would have lessened any chance of occurrence on site.
<i>Cryptostylis hunteriana</i> – Leafless Tongue Orchid	Not found during flora survey. Some potential habitat may occur in riparian vegetation, which is likely to be retained. Clearing and grazing would have lessened any chance of occurrence over remainder of site.
<i>Diuris praecox</i> – A Donkey Orchid	Not found during flora survey. Some potential habitat may occur, though clearing and grazing would have lessened any chance of occurrence.
<i>Syzygium paniculatum</i> – Magenta Lilly Pilly	No <i>in situ</i> specimens found during flora survey. Favoured habitat absent. Site clearance would have lessened any chance of occurrence.
<i>Tetradlea juncea</i> – Black-eyed Susan	Not found during flora survey. Clearing and grazing would have lessened any chance of occurrence over remainder of site.
Herpetofauna	
<i>Crinia tinnula</i> – Wallum Froglet	Not found during fauna survey. Some small areas of habitat in the riparian zone may be suitable, though cattle intrusion has degraded such areas. Likely that such areas would be excluded from development.
Avifauna	
<i>Calidris tenuirostris</i> – Great Knot	Not found during flora survey. Fringe areas around lake edge only potential. Such habitat is not proposed for development.
<i>Calyptorhynchus lathamii</i> – Glossy Black-Cockatoo	Not found during fauna survey. Large trees with hollows offer some potential nesting habitat & <i>Casuarina glauca</i> trees offer some marginal foraging habitat. However, such habitat is not optimal for this species.
<i>Charadrius leschenaultii</i> – Greater Sand Plover	Not found during flora survey. Fringe areas around lake edge only potential. Such habitat is not proposed for development.
<i>Diomedea melanophrys</i> – Black-browed Albatross	Not found during fauna survey. Pelagic species. Extremely unlikely to be affected by any activity on site.
<i>Ephippiorhynchus asiaticus</i> – Black-necked Stork	Not found during fauna survey. Some marginal habitat present in the form of small dams, and along the lake fringes. Unlikely to be significantly affected by activity on site.
<i>Haematopus fuliginosus</i> – Sooty Oystercatcher	Not found during fauna survey. No habitat present on site. Lake fringes provide some small areas of habitat. Unlikely to be affected by any activity on site.

SPECIES	COMMENTS
<i>Haematopus longirostris</i> – Pied Oystercatcher	Not found during fauna survey. No habitat present on site. Lake fringes offer some habitat. Unlikely to be affected by any activity on site.
<i>Ixobrychus flavicollis</i> – Black Bittern	Not found during fauna survey. Fringe areas around lake edge where vegetation occurs only possibility of occurrence. Such habitat is not proposed for development.
<i>Lathamus discolor</i> – Swift Parrot	Not found during fauna survey. Some trees on site may offer some seasonal foraging habitat. Unlikely to be dependent on any resources present on site.
<i>Neophema pulchella</i> – Turquoise Parrot	Not found during fauna survey, though some potential nesting and foraging habitat is present. Presence not expected, given this species is rare in coastal areas. Unlikely to be significantly affected by any activity on the site.
<i>Ninox connivens</i> – Barking Owl	Not found during fauna survey. Marginal nesting & hunting habitat present. However, given the absence of definitive signs of nesting, species unlikely to be dependant on resources present on site.
<i>Ninox strenua</i> – Powerful Owl	Not found during fauna survey. Marginal nesting & hunting habitat present. However, given the absence of definitive signs of nesting, species unlikely to be dependant on resources present on site.
<i>Pandion haliaetus</i> – Osprey	Not found during fauna survey. Trees on site offer potentially suitable nesting locations for this species, though absence of definitive signs of nesting means an impact of significance is not expected.
<i>Ptilinopus regina</i> – Rose-crowned Fruit-Dove	Not found during fauna survey. Habitat present unlikely to attract this species.
<i>Ptilinopus superbus</i> – Superb Fruit-Dove	Not found during fauna survey. Habitat present unlikely to attract this species.
<i>Puffinus assimilus</i> – Little Shearwater	Not found during fauna survey. Pelagic species. Extremely unlikely to be affected by any activity on site.
<i>Puffinus carneipes</i> – Flesh-footed Shearwater	Not found during fauna survey. Pelagic species. Extremely unlikely to be affected by any activity on site.
<i>Sterna albifrons</i> – Little Tern	Not found during fauna survey. Fringe areas around lake edge only potential. Such habitat is not proposed for development.
<i>Tyto novaehollandiae</i> – Masked Owl	Not found during fauna survey. Marginal nesting & hunting habitat present. However, given the absence of definitive signs of nesting, species unlikely to be dependant on resources present on site.
<i>Xanthomyza phrygia</i> – Regent Honeyeater	Not found during fauna survey. Some trees on site may offer some seasonal foraging habitat. Unlikely to be dependant on any resources present on site.
Mammals	
<i>Dasyurus maculatus</i> – Tiger Quoll	Not found during fauna survey. Cleared nature of the site not conducive to habitation by this species.
<i>Pteropus poliocephalus</i> – Grey-headed Flying-fox	Not found during fauna survey. Some potential seasonal foraging habitat present. No potential roost camp habitat present. Unlikely to be significantly affected by any activity on the site.
<i>Miniopterus australis</i> – Little Bentwing-bat	Not found during fauna survey. Potential hunting habitat present, though roosting habitat is absent. Unlikely to be significantly affected by any activity on site.

SPECIES	COMMENTS
<i>Miniopterus schreibersii</i> – Large Bentwing-bat	Not found during fauna survey. Potential hunting habitat present, though roosting habitat is absent. Unlikely to be significantly affected by any activity on site.
<i>Mormopterus norfolkensis</i> – East-coast Freetail-bat	Calls not inconsistent with this species recorded during fieldwork. Potential roosting and hunting habitat present. A potential species of concern. Hollow trees (potential roosts) are the most important features for this species on the site.
<i>Myotis adversus</i> – Large-footed Myotis	Not found during fauna survey. Potential roosting and hunting habitat present. Hollow trees (potential roosts) are potentially the most important features for this species on the site.
<i>Petaurus australis</i> – Yellow-bellied Glider	Not found during fauna survey. Habitat types on site not generally favoured by this species. Unlikely to be significantly affected by any activity on site.
<i>Petaurus norfolcensis</i> – Squirrel Glider	Not found during fauna survey, though reported previously from the site (Joanne Foster, <i>pers.comm</i>). Treed habitat types present may be potentially utilised by this species. A potential species of concern. Hollow trees (potential nests) are the most important features for this species on the site. Consideration should be given to retaining habitat linkages such as exist in the fringing riparian corridor, which provide connection off the western boundary of the site into nearby SRA areas.
<i>Phascogale tapoatafa</i> – Brush-tailed Phascogale	Not found during fauna survey. Treed habitat types present may be potentially utilised by this species, though its presence is not expected.
<i>Phascolarctos cinereus</i> – Koala	Not found during fauna survey. Treed habitat types present may be potentially utilised by this species, though the lack of evidence of site usage would suggest that activity on this site would not significantly affect this species. Site is not considered to form any part of a corridor for this species.
<i>Planigale maculata</i> – Common Planigale	Not found during fauna survey. Cleared nature of understorey would deter this species. Unlikely to be significantly affected by any activity on site.
<i>Saccolaimus flaviventris</i> – Yellow-bellied Sheath-tail-bat	Not found during fauna survey. Potential roosting and hunting habitat present. Hollow trees (potential roosts) are potentially the most important features for this species on the site.
<i>Scoteanax rueppellii</i> – Greater Broad-nosed Bat	Not found during fauna survey. Potential roosting and hunting habitat present. Hollow trees (potential roosts) are potentially the most important features for this species on the site.

5.2 SECTION 5A (EIGHT PART TEST) CONSIDERATIONS

From the table above, it can be seen that two species will definitely require consideration under Section 5A of the EP&A Act 1979 for any large scale development proposal on the site, these being the Squirrel Glider (*Petaurus norfolcensis*) and the East-coast Freetail-bat (*Mormopterus norfolkensis*). These species will have to be considered due to their known presence on the site, and the presence of potentially important habitat resources. (A further ten species may also be affected via activity on the site potentially contributing to incremental habitat loss / modification in a regional sense, though such loss / modification is not foreseen as likely to be significant.)

Evaluation of the habitat requirements for these species, and hence, important habitat features on the site, identifies that the following attributes are potentially important:

- Mature trees bearing hollows.
- Riparian (lake edge) vegetation providing connection off the site to proximate areas leading to the SRA to the west.

Other features that may be seen as having some additional conservation value include:

- All riparian vegetation on site.
- *Eucalyptus robusta* trees occurring on site.

The location of all of the above features are indicated on the Vegetation Community Plan (Figure 4) and the Significant Tree Survey Plan (Appendix D). These potential ecological constraints should be duly considered in the final design phase for any development ultimately proposed for the site. Also, tree retention in general is recommended where possible.

It should be noted that retaining these features would be a precautionary approach to greatly lessen any chance of a significant impact upon any threatened species resulting from development. It may still be possible to remove / modify any or all of these features and not have a significant effect, though such removal / modification would require appropriate scrutiny under the eight part test for potentially affected threatened species. This is particularly applicable to hollow bearing trees in this instance.

6.0 SEPP 44 ASSESSMENT

6.1 FIRST CONSIDERATION – IS THE LAND ‘POTENTIAL KOALA HABITAT’?

Trees occurring on site that are listed within Schedule 2 of SEPP 44 as Koala Feed Trees include:

- *Eucalyptus tereticornis* (Forest Red Gum), which is one of the dominant trees occurring on site.
- *Eucalyptus haemastoma* (Scribbly Gum), which is a co-dominant tree species in the southern half of the site.
- *Eucalyptus robusta* (Swamp Mahogany), which occurs as a small number (11) of trees on site, mainly along the north-western boundary.
- *Eucalyptus microcorys* (Tallowwood), which occurs as a singular specimen within the landscaped garden area.

These trees comprise a significant portion of the total tree count on site, and would clearly be well in excess of 15% of the total tree count. Consequently, it was adopted that the site comprises ‘Potential Koala Habitat’ and that further investigation for ‘Core Koala Habitat’ was required.

6.2 SECOND CONSIDERATION – IS THE LAND ‘CORE KOALA HABITAT’?

Investigations on the site for koalas included:

- Searches for scats underneath preferred Koala feed trees (and other trees as well). This included careful checking of Brushtail Possum scats, as these can be similar in general appearance to Koala scats.
- Searches for scratches on tree boles consistent with this species.
- Scanning trees with binoculars during diurnal surveys for signs of Koalas.
- Spotlighting of trees for signs of Koalas during nocturnal surveys.

These searches yielded no signs of Koalas. No records of this species exist within 2km of the site on the NPWS Database.

Given these results, it is considered apparent that the site does not constitute ‘Core Koala Habitat’. Therefore, no further provisions of SEPP 44 would apply to this site.

7.0 CONSIDERATIONS UNDER THE EP&BC ACT 1999

Considerations have been made to the Environment Protection & Biodiversity Conservation Act 1999 (EP&BC Act – Commonwealth legislation). Searches of the Environment Australia On-line Database were undertaken to gather baseline data on the site and general locality. This data, combined with other local knowledge and records, was utilised to assess whether the type of activity proposed on the site will have, or is likely to have a significant impact upon a matter of National Environmental Significance (NES), or on the environment of Commonwealth land.

* The site is not land owned by the Commonwealth, and hence this portion of the Act is not applicable.

* The matters of NES and site specific responses are listed below.

- *World Heritage areas:*

The site is not a World Heritage area, and is not in close proximity to any such area.

- *Wetlands protected by international treaty (the RAMSAR convention):*

The site is not part of any RAMSAR Wetland area, and is not in close proximity to any such area.

- *Nationally listed threatened species and ecological communities:*

All pertinent species listed within national schedules have been considered by this proposal specifically in relation to potential impacts under state legislation. In each case, these species were found unlikely to be significantly affected by any proposed activity on the site.

The two species identified as requiring further consideration in relation to type and extent of activity on site (namely *Petaurus norfolkensis* and *Mormopterus norfolkensis*) are not listed within National schedules, and are not required to be considered under this Act.

- *Nationally listed migratory species:*

One nationally listed migratory species was noted on site during the field survey, being Cattle Egret (*Ardea ibis*). This species is widely known from the region and is considered very common in habitat such as that present. Activity on the site is not considered likely to significantly affect population numbers or habitat availability for this species, nor upset migratory patterns.

Personal communication from a neighbour identified the presence of another nationally listed migratory species, being the White-bellied Sea-Eagle (*Haliaeetus leucogaster*). The site provides potentially suitable nesting habitat adjacent to preferred feeding waters, though no

sign of any nesting by this species (or the species itself) could be noted during fieldwork. Activity on the site is not considered likely to significantly affect population numbers or habitat availability for this species.

Several other migratory species listed within the Act were recognised as having potential to occasionally frequent the site or immediate surrounds. Given the type of habitat occurring on site, the availability of similar habitat in the immediate locality, and the total retention of riparian / estuarine habitat areas, it is not considered likely that activity on the site would significantly affect population numbers or habitat availability for any of these species, nor upset migratory patterns.

- *All nuclear actions:*

No type of nuclear activity is proposed for the site.

- *The environment of commonwealth marine areas:*

The proposed activity on the site will not have a significantly adverse effect on any commonwealth marine area.

8.0 RECOMMENDATIONS

Evaluation of the habitat requirements for threatened species, and hence, important habitat features on the site, identifies that the key habitat attribute features on site are hollow bearing trees. These are potentially likely to be utilised by two threatened species (Squirrel Glider and East-coast Freetail-bat), and are being utilised for nesting by a considerable number of native bird species (at least six species confirmed), and by Brushtail Possums (*Trichosurus* spp.). It is also likely that other bird species and microchiropteran bat species are utilising the hollows present as nesting / roosting sites. As such, strong consideration should be given to retaining these trees within the proposal.

Whilst hollow trees do occur within fringe areas of the site that can be readily incorporated into waterfront reserve areas, the majority of hollow trees occur within more central areas of the site that are likely to be seriously considered for development. Whilst it may be possible that the removal of these trees would not pose a significant effect on any threatened fauna species (i.e. no threatened fauna species have been positively identified as residing on the site), it is just as likely that such species do reside on site within one or more of the hollow trees present. Also, the effect on native (protected) species in general must be taken into consideration, particularly when breeding activity is occurring.

It is recognised that large hollow bearing trees with unstable limbs are not usually tolerated within residential settings, given the inherent public safety issues that arise. In instances where any such trees have to be removed, the following approaches should be considered:

- Detailed examination of trees via cavity searches where possible, or by stagwatching of individual hollow entrances at dusk for signs of emerging fauna. Threatened fauna that need to be captured and relocated will require specific trapping strategy, relocation assessment and appropriate licensing from NPWS.
- Selective lopping of unstable limbs so that the more stable central trunk of a tree may remain *in situ*. Any such removal should only take place in the presence of a suitably qualified wildlife consultant who can deal accordingly with any affected animals.
- Any removed limbs should be carefully moved and repositioned and affixed in suitable trees in reserve areas to help offset hollow loss.
- Construction and installation of a suitable array of nest boxes should be considered for Public Reserve areas and within the bounds of the development to help mitigate against any tree hollow loss.

Other following habitat / environmental attributes are potentially important, and whilst not critical to threatened species as is the case with hollow trees, should also be considered for retention. Such features include:

- *Casuarina glauca* (Swamp She-oak) stand of forest on the northern foreshore of the peninsula (incorporating lake fringing mangroves and salt marsh), and riparian

- (lake edge) vegetation in general
- *Eucalyptus robusta* (Swamp Mahogany) trees, as this species is considered Regionally Significant due to its prolific nectar production and winter flowering period.
- Trees in general on the site, with retention preference given to larger specimens.
- Water bodies (small dams) on site.

In conclusion, if all hollow bearing trees and riparian vegetation communities are retained, then it would be extremely unlikely that development activity on the site would significantly affect any threatened species. However, if any or all of these features / areas are proposed to be modified, then further assessment and consideration will have to be given to the identified threatened species that may be potentially affected.

10.0 BIBLIOGRAPHY

- Allison, F.R. and Hoyer, G.A. (1995). Eastern Freetail-bat (*Mormopterus norfolkensis*). In: *The Mammals of Australia*, pp: 484-485. Strahan, R. (Ed). Reed Books, Australia.
- Bishop, T. (2000). *Field Guide to the Orchids of NSW and Victoria*. (2nd edition). University of NSW Press, Sydney.
- Blomberry, A.M. and Maloney, B. (1992). *The Proteaceae of the Sydney Region*. Kangaroo Press, Sydney.
- Bodkin, F (1991). *Encyclopaedia Botanica*. Cornstalk, Sydney.
- Braithwaite, R.W. (1991). Fauna and Habitat Surveys as Ecological Pathfinders. In: *Nature Conservation Cost Effective Biological Surveys and Data Analysis*. Margules, C.R. and Austin, M.P. (Eds.). CSIRO, Australia.
- Briggs, J.D. and Leigh, J.H. (1995). *Rare or Threatened Australian Plants*. CSIRO Publishing, Victoria.
- Brooker, M.I.H. and Kleining, D.A. (1999). *Field Guide to Eucalypts of South-eastern Australia*. Volume 1, 2nd edition. Inkata Press, Sydney.
- Brouwer, J. and Garnett, S. (eds) (1990). *Threatened Birds of Australia: An Annotated List*. Royal Australasian Ornithologists Union (RAOU) Report Number 68.
- Churchill, S. (1998). *Australian Bats*. Reed New Holland Publishers, Sydney, Australia.
- Clancy, G.P. (1991). *The Biology and Management of the Osprey (Pandion haliaetus cristatus) in NSW*. NSW National Parks and Wildlife Service, Sydney.
- Cogger, H.G. (1996). *Reptiles and Amphibians of Australia*. Fifth edition. Reed International, Chatswood, N.S.W.
- Cronin, L. (1991). *Key Guide to Australian Mammals*. Reed Books, Australia.
- Cronquist, A. (1981). *Integrated System of Classification of Flowering Plants*. University Press, New York.
- Cropper, S. (1993). *Management of Endangered Plants*. CSIRO Publications, East Melbourne, Victoria.
- Department of Urban Affairs and Planning (DUAP). (2000). *State Environmental Planning Policies*. Summary guide, updated 4 May 2000.
- Dwyer, P.D. (1995a). Little Bentwing-bat (*Miniopterus australis*). In: *The Mammals of Australia*, pp: 492-493. Strahan, R. (Ed). Reed Books, Australia.
- Dwyer, P.D. (1995b). Common Bentwing-bat (*Miniopterus schreibersii*). In: *The Mammals of Australia*, pp: 494-495. Strahan, R. (Ed). Reed Books, Australia.
- Edlin, H.L. (1978). *The Tree Key*. Fredrick Warne Publishers Ltd, London.
- Ehmann, H. (Ed) (1997). *Threatened Frogs of New South Wales: Habitats, Status and Conservation*. Frog and Tadpole Study Group of NSW.
- Forest Fauna Surveys, EcoPro P/L and Fly By Night Bat Surveys P/L. (1997). *Flora and Fauna Survey Guidelines – Lake Macquarie City Council*. Prepared for LMCC, December 1997.
- Forshaw, J. M. (1991). *Australian Parrots* (2nd Ed.). Ure Smith Press, Willoughby, NSW.
- Forshaw, J. M. (1993). Swift Parrot (*Lathamus discolor*) In: *Readers Digest Complete Book of Australian Birds* (2nd edn.). Schodde, R. and Tiedemann, S. (eds). Readers Digest, Sydney.
- Griffiths, K. (1987). *Reptiles of the Sydney Region*. Three Sisters Productions Pty. Ltd., Winamalee, Sydney.

- Harden, G. (ed) (2000). *Flora of New South Wales, Volume 1*. Revised edition. New South Wales University Press, NSW.
- Harden, G. (ed) (1991). *Flora of New South Wales, Volume 2*. New South Wales University Press, NSW.
- Harden, G. (ed) (1992). *Flora of New South Wales, Volume 3*. New South Wales University Press, NSW.
- Harden, G. (ed) (1993). *Flora of New South Wales, Volume 4*. New South Wales University Press, NSW.
- Hnatiuk, R.J. (1990). *Census of Australian Vascular Plants*. Australian Flora and Fauna Series No.11. Australian Government Publishing Service, Canberra.
- Hoye, G.A. and Richards, G.C. (1995). Greater Broad-nosed Bat (*Scoteanax rueppellii*). In: *The Mammals of Australia*, pp: 527-8. Strahan, R. (Ed). Australian Museum / Reed Books, Sydney.
- Hunter Bird Observers Club (1999). *Hunter Region of New South Wales – Annual Bird Report – Number 7 (1999)*. ISSN 1322-5332.
- Lamp, G.A., Forbes, S.J. and Cade, J.W. (1990). *Grasses of Temperate Australia*. Inkata Press, Sydney.
- Macoboy, S. (1997). *What Tree Is That?* Lansdowne Publishing.
- Matthews B & L. (1993). *Garden Plants*. Australian Home and Garden Handbooks. Weldon Publishing.
- Morcombe, M. (2000). *Field Guide to Australian Birds*. Steve Parish Publishing, Archerfield, Australia.
- Nature Conservation Council (1999). *Threatened Species Network - Regent Honeyeater Species Profile Sheet*. <http://nccnsw.org.au/member/tsn/context/profiles/22196.html>
- NSW National Parks and Wildlife Service (2001). *Wildlife Database 1:100,000 map sheets covered '9131' Gosford and '9231' Lake Macquarie*.
- NSW National Parks and Wildlife Service (2000a). *Vegetation Survey, Classification and Mapping – Lower Hunter and Central Coast Region. Version 1.2*. The Lower Hunter and Central Coast Regional Environment Management Strategy (REMS). April 2000.
- NSW National Parks and Wildlife Service Database (2000b). *Fauna Species List for Protected Areas in NSW*, at '<http://www.npws.gov.au/wildlife/species.htm>'.
- NSW National Parks and Wildlife Service Scientific Committee (1998b). *Final Determination to list Angophora inopina as a Vulnerable species*, at 'www.nsw.npws.gov.au'.
- NSW National Parks and Wildlife Service (1996a). *NSW Comprehensive Regional Assessments Vertebrate Fauna Surveys. 1996-1997 Summer Survey Season Field Survey Methods*.
- NSW National Parks and Wildlife Service (1996b). *Threatened Species Management - Information Circular No 2 Threatened Species Assessment under the EP&A Act*. NPWS, Hurstville.
- Payne, R. (1998). *Lake Macquarie Tetratheca juncea Conservation Management Plan - Interim Report*. September 1998. Report prepared for NSW NPWS, BHP Pty. Ltd. and LMCC.
- Payne, R. (1993a). *Prediction of the habitat for Tetratheca juncea in the Munmorah Area, near Wyong, NSW*.
- Pizzey, G. and Knight, F. (1999). *Field Guide to the Birds of Australia*. Angus and Robertson, Sydney.
- Proudley, B & V. (1977). *Garden Conifers in Colour*. Reed Books, Australia.
- Quin, D.G. (1993). *Sociology of the Squirrel Glider and the Sugar Glider*. PhD Thesis, Department of Ecosystem Management, University of New England.

- Random House Australia (2000). *500 Popular Climbers & Creepers for Australian Gardeners*. Random House Australia, Milsons Point, Sydney.
- Reader's Digest (1982) *Complete Book of Australian Birds*. Reader's Digest Services Pty. Ltd. Sydney.
- Recher, H.F., Date, E.M. and Ford, H.A. (1995). *The Biology and Management of Rainforest Pigeons in N.S.W. Species Management Report No. 16*. NSW National Parks and Wildlife Service.
- Richards, G.C. (1995). Yellow-bellied Sheath-tail-bat (*Saccolaimus flaviventris*). In: *The Mammals of Australia*, pp: 467. Strahan, R. (Ed). Australian Museum / Reed Books, Sydney.
- Robinson, L. (1994). *Field Guide to the Native Plants of Sydney* (2nd edn.). Kangaroo Press, Kenthurst, NSW.
- Robinson, M. (1996). *A Field Guide to the Frogs of Australia*. An Australian Museum / Reed Publication.
- Rotherham, E.R., Briggs, B.G., Blaxell, D.F. & Carolin, R.C. (1982). *Flowers and Plants of New South Wales and Southern Queensland*. Reed Publishing.
- Rowston, C. (1998). *Nest and refuge-tree usage by Squirrel Gliders (Petaurus norfolcensis), in south-east Queensland*. Wildlife Research 25: 157-164.
- Russell, R. (1995). Yellow-bellied Glider (*Petaurus australis*). In: *The Mammals of Australia*, pp 226-228. Strahan, R. (Ed). Reed Books, Australia.
- Sainty, G.R. & Jacobs, S.W.L. (1981). *Waterplants of New South Wales*. Water Resources Commission of NSW.
- Sainty, G, Hosking, J, Abell, P, Jacobs, S & Dalby-Ball, M. (2000). *Burnum Burnum's Wildthings*. Revised edition. Sainty & Associates Pty. Ltd.
- Simmons, M. (1987). *Acacias of Australia: Volume 1*. Viking O'Neill, Victoria.
- Simmons, M. (1988). *Acacias of Australia: Volume 2*. Viking O'Neill, Victoria.
- Simpson, K. and Day, N. (1999). *Field Guide to the Birds of Australia*. 6th Edition. Viking Books, Victoria.
- Slater, P, Slater, P. and Slater, R. (1988). *The Slater Field Guide to Australian Birds*. Lansdowne-Rigby, Willoughby, NSW.
- Smith, A. (1996). *On The Brink - Squirrel Gliders, Pittwater Council and Housing Development*. At '<http://www.nccsw.org.au/bushland/reference/onthebrink/Squirrel.html>'.
- Specht, R. L. (1981). *Major vegetation formations in Australia*. In Australian Soil and Land Survey. Inkata Press. Melbourne.
- State Forests of NSW (1994) *Flora Survey, Morriset Forestry District, Central Region, NSW*. Forest Resources series No. 35.
- Strahan, R. (Ed) (1995a). *The Mammals of Australia*. Reed Books, Chatswood, NSW.
- Strahan, R. (1995b). *A Photographic Guide to the Mammals of Australia*. An Australian Museum / New Holland Publication.
- Triggs, B. (1999). *Tracks, Scats and Other Traces: A Field Guide to Australian Mammals*. Oxford University Press, Australia.
- Wrigley, J.W. and Fagg, M. (1993). *Bottlebrushes, Paperbarks and Tea-trees*. Angus and Robertson, Sydney.
- Wrigley, J.W. and Fagg, M. (1998). *Australian Native Plants – Propagation, cultivation and use in landscaping*. 4th edition. New Holland Press.
- Yates Garden Guide. 36th edition. (1984). Arthur Yates & Co. Pty. Ltd.

APPENDIX A

FLORA SPECIES LIST

FLORA SPECIES LIST

The following list includes all species of vascular plants observed on the subject site during fieldwork. It should be noted that such a list cannot be considered comprehensive, but rather indicative of the flora. It can take many years of flora surveys to record all of the plant species occurring within any area, especially plant species that are only apparent in some seasons such as orchids.

A number of species cannot always be accurately identified during a brief survey, generally due to a lack of suitable flowering and/or fruiting material. Any such species are identified as accurately as possible, and are indicated in the list thus:

- * Specimens which could only be identified to genus level are indicated by the generic name followed by the abbreviation "sp.", indicating an unidentified species of that genus;
- * Specimens for which identification of the genus was uncertain are indicated by a question mark ("?",) following the generic, which is in turn followed by the abbreviation "sp.";
- * Specimens which could be accurately identified to genus level, but could be identified to species level with only a degree of certainty are indicated by a ("?",) placed in front of the epithet.

Authorities for the scientific names are not provided in the list. These follow Harden (1991, 2000). Names of families and higher taxa also follow Harden.

Introduced species are indicated by an asterisk ("*").

The following standard abbreviations are used to indicate subspecific taxa:

- ssp. - subspecies
- var.- variety
- X - hybrid between the two indicated species

FAMILY / Scientific Name	Common Name
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DIVISION POLYPODIOPHYTA (Ferns and Allies)

ADIANTACEAE <i>Adiantum aethiopicum</i>	Common Maidenhair Fern
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DAVALLIACEAE <i>*Nephrolepis cordifolia</i>	Fishbone Fern
--	---------------

DENNSTAEDTIACEAE <i>Histiopteris incisa</i> <i>Pteridium esculentum</i>	Batswing Fern Bracken
---	--------------------------

DICKSONIACEAE <i>Calochlaena dubia</i>	False Bracken
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DIVISION CYCADOPSIDA (Cycads)

ZAMIACEAE <i>Macrozamia communis</i>	Burrawang
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DIVISION CONIFEROPSIDA (Conifers)

ARAUCARIACEAE <i>Araucaria heterophylla</i>	Norfolk Island Pine
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PINACEAE <i>Chamaecyparis</i> sp. <i>Pinus</i> sp.	
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DIVISION MAGNOLIOPHYTA (Flowering Plants)

CLASS MAGNOLIOPSIDA (Dicotyledons)

ACANTHACEAE <i>*Acanthus spinosus</i> <i>Pseuderanthemum variabile</i>	Oyster Blade
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AIZOACEAE <i>Tetragonia tetragonioides</i>	New Zealand Spinach
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APIACEAE <i>Apium prostratum</i> var. <i>filiforme</i> <i>Centella asiatica</i> <i>*Hydrocotyle bonariensis</i> <i>Hydrocotyle geraniifolia</i>	Sea Celery Kurnell Curse Forest Pennywort
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APOCYNACEAE <i>*Nerium oleander</i> <i>Parsonsia straminea</i> var. <i>straminea</i>	Oleander Monkey Rope
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ARALIACEAE <i>*Hedera helix</i> <i>Schefflera actinophylla</i>	English Ivy Umbrella Tree
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ARECACEAE

Livistona australis Cabbage-tree Palm

ASTERACEAE

**Ageratina adenophora* Crofton Weed
**Bidens pilosa* Cobbler's Pegs
**Chrysanthemoides monilifera* ssp. *rotundata* Bitou Bush
**Cirsium vulgare* Spear Thistle
**Conyza* sp. Fleabane
Gnaphalium sp. Cudweed
**Hypochaeris radicata* Flatweed
Leptinella longipes
**Plantago lanceolata* Plantain
**Rumex* sp. Dock
**Senecio latus*
**Senecio madagascariensis* Fireweed
**Sida rhombifolia* Paddy's Lucerne
**Sonchus oleraceus* Common Sowthistle
**Taraxacum officinale* Dandelion
**Trifolium repens* White Clover

AVICENNIACEAE

Avicennia marina var. *australasica* Grey Mangrove

BALSAMINACEAE

**Impatiens walleriana* Busy Lizzie

BIGNONIACEAE

**Jacaranda mimosifolia* Jacaranda

CASUARINACEAE

Allocasuarina sp.
Casuarina glauca Swamp She-oak

CHENOPODIACEAE

Atriplex hastata Orache
Sarcocornia quinqueflora Samphire
Suaeda australis Austral Seablite

CONVOLVULACEAE

Dichondra repens Kidney Weed

CRASSULACEAE

**Bryophyllum delagoense* Mother-of-Millions
**Bryophyllum pinnatum* Resurrection Plant

DILLEACEAE

Hibbertia scandens Golden Guinea Flower

ERICACEAE

**Azalea* sp. Azalea

EUPHORBIACEAE

Breynia oblongifolia Breynia
**Euphorbia peplus* Petty Spurge
Glochidion ferdinandi Cheese Tree

FABACEAE

**Erythrina X sykesii* Coral Tree
Hardenbergia violacea False Sarsaparilla
Pultenaea palacea