

PART LOT 28 DP 871790 SEASPRAY STREET,
NARRAWALLEE

PROPOSED REZONING AND RESIDENTIAL
DEVELOPMENT

FLORA & FAUNA ISSUES

JULY 1999

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1 INTRODUCTION

1.1 Background

A portion of land at Seaspray Street, Narrawallee (Part of Lot 28 DP 871790) is proposed for rezoning. The 'Subject Site' has a total land area of 14.13ha and is bounded by urban development and coastal forest. Pursuant to the *Shoalhaven City Council Local Environmental Plan 1985* and its amendments (LEP 1985; LEP 1998), the land is currently zoned 7(d2) - Environmental Protection - *Special Scenic* (Shoalhaven City Council 1996), upon rezoning the land will be classified as 2(c) - Residential (Living Area).

It is proposed that once rezoned the land will be subdivided and developed by the construction of dwellings and associated features within the areas nominated as suitable for development.

The subject site is located within the Milton - Ulladulla local area and is typified by the geology and soils associated with local coastal environments in and around the Shoalhaven. The local area generally supports coastal forests and woodlands dominated by Blackbutt and Turpentine associations. Densely forested areas exist to the north and west of the subject site, including Crown Lands and Morton National Park.

Vegetation on the subject site is generally classified as open forest to tall open forest with a moderate understorey characterised by a community of Blackbutt and Turpentine associations (ERIC 1998). The subject site has previously undergone minor logging operations, ground cover and shrub layer vegetation slashing and some clearance for fire hazard reduction (Cowman Stoddart 1994), leaving the canopy on the site dominated by mature Blackbutt and Turpentine trees. The shrub layer in the woodland zone is relatively open, with little evidence of continued disturbance. The subject site currently contains several boundary access tracks and a small drainage channel. There is no evidence of recent fire (<5 years) across the site.

1.2 Previous studies

Several previous studies have been carried out on the site and within the locality and have been referred to in this current assessment. They include the following:

Shoalhaven City Council (1999) *Review of impacts on Powerful Owl by proposed residential rezoning, Seaspray Street, Narrawallee.*

Coombes (1998) *Powerful Owl (Ninox strenua) and Glossy Black Cockatoo (Calyptorhynchus lathami) Nesting Assessment.*

Kevin Mills & Associates (1998a) *Flora and Fauna Study Part Lot 28, DP 871790 Seaspray Street, Narrawallee, City of Shoalhaven.*

Kevin Mills & Associates (1998b) *Supplementary Flora and Fauna Study Part Lot 28, DP 871790 Seaspray Street, Narrawallee, City of Shoalhaven.*

¹ The 'Subject Site' is land contained within part lot 28 DP 871790, Seaspray Street, Narrawallee.

Kevin Mills & Associates (1994) *Preliminary Flora and Fauna Study Part Lot 28, DP 871790 Seaspray Street, Narrawallee City of Shoalhaven.*

Cowman Stoddart (1994) *Preliminary Flora and Fauna Assessment - Land at Narrawallee, Shoalhaven.*

1.3 Report Aims and Objectives

This investigation and report were undertaken to provide details of issues relating to flora and fauna and their habitats in the area covered by the proposed rezoning. The specific aims of this investigation are:

- to determine the nature of and to describe the fauna habitats present on the site with specific reference to threatened species, as listed on the NSW Threatened Species Conservation Act 1995;
- to assess the significance of potential impacts (direct or indirect) which may arise from the proposed rezoning on native fauna and flora; and
- to document environmental management and impact amelioration measures which can be implemented to limit the effects of the proposal on native biota, and to enhance the local environment for native fauna and flora conservation, where possible.

2 RELEVANT THREATENED SPECIES

2.1 Introduction

The potential occurrence of several threatened fauna species within the Narrawallee locality has been discussed in previous studies (Cowman Stoddart 1994; Mills 1998a; Coombes 1998; Shoalhaven City Council 1999) and are identified below. These past reports considered that it would be highly unlikely for the majority of these threatened fauna species to be solely, if at all, dependent on the subject site (with the exception of the Powerful Owl and to a lesser extent the Glossy Black Cockatoo).

The threatened species which have been potentially identified in the locality include:

Yellow-bellied Glider	<i>Petaurus australis</i>
Squirrel Glider	<i>Petaurus</i>
Southern Brown Bandicoot	<i>Isodon obesulus</i>
Common Bentwing Bat	<i>Miniopterus schreibersii</i>
Powerful Owl	<i>Ninox strenua</i>
Regent Honeyeater	<i>Xanthomyza phrygia</i>
Glossy Black Cockatoo	<i>Calyptorhynchus lathamii</i>
Swift Parrot	<i>Lathamus discolor</i>
Green & Golden Bell Frog	<i>Litoria aurea</i>
Giant Burrowing Frog	<i>Heleioporus australiacus</i>

2.2 Powerful Owl *Ninox strenua*

Relevant considerations when assessing the subject site with respect to the Powerful Owl (which has been indicated as potentially occurring on the subject site Coombes 1998; Mills 1998a&b) include:

- the likely relevance or significance of the site, based on sightings of the species, indirect evidence and the presence or otherwise of relevant habitat features or resources;
- the nature and condition of the subject site;
- the tolerance of Powerful Owls to disturbed or modified environments;

- the nature of the proposed development; and
- the context of the subject site with respect to its likely use by Powerful Owls in the locality and region.

2.2.1 Habitat Requirements

The subject site supports open forest vegetation which could doubtless be utilised by Powerful Owls for foraging and roosting. During the non-breeding season, this species regularly roosts in dense canopy vegetation (such as is provided by the Turpentine *Syncarpia glomulifera*), and such resources are available on the subject site, particularly around the western and northern boundaries. Additionally, the Powerful Owl forages through the forest canopy for arboreal mammals (such as the Ringtail Possum and Gliders). The open forest on the subject site is likely to support an array of suitable prey species, given the presence of suitable tree-hollows for such species and the nature of the vegetation present.

Conversely, large tree-hollows suitable as breeding sites for the Powerful Owl appear to be rare on the subject site and in the vicinity. None of the trees observed in the area proposed for development on the subject site appear suitable for nesting by the Powerful Owl, and those trees with the largest tree-hollows are also located along the northern and western boundaries of the subject site (Coombes 1999). It is not likely that the Powerful Owl utilises the subject site for breeding purposes, and the area proposed for development activities in particular is of no relevance in this regard.

The Powerful Owl is relatively tolerant of various levels of disturbance to its habitat, being noted as occurring within the greater metropolitan areas of Brisbane, Sydney and Melbourne. Webster *et al* (1999) note that the Powerful Owl "*may be more numerous and breed more successfully in a wider range of habitats than previously believed*". Debus & Chaffer (1994), and Pavey (1993) note that the species "*can breed successfully close to passive human presence, tolerating low-level disturbance near the nest tree*". Pavey *et al* (1994) note that "*hunting habitat can include regrowth forest and woodland, forest edges, parkland and suburbs*" and that "*the ecological requirements of Powerful Owls are more flexible than previously expected*". There are anecdotal records of Powerful Owls roosting within suburban development areas in Sydney, albeit close to areas of native bushland, and successful breeding has been recorded in areas frequented by humans (Pavey 1993; Quinn 1993; McNabb 1996).

2.2.2 Context and Condition of the Subject Site

With respect to the subject site, previous disturbance of the open forest present has been relatively minor, and is limited generally to the creation of tracks, some weed-infestation and previous timber removal activities, as well as bushfire. Given the nature of the proposed development (including the retention of bushland in the creekline area by the application of a "*Restriction as to User*" covenant over relevant lots on the subject site) and the apparent tolerance of Powerful Owls to some residential development and habitat disturbance (as noted above), it is considered likely that Powerful Owls will continue to utilise the subject site following development (if they currently do so).

As noted above, the subject site has been subject to previous disturbance and habitat modification, and the understorey generally displays evidence of modification as a result of hazard reduction burning and localised areas of weed-infestation. Whilst the site supports a relatively intact tree canopy, there is ample evidence of previous timber harvesting and a substantial proportion of the trees present are relatively young. Nevertheless, there are also a number of dead stags and hollow-bearing trees on the site, although few large tree-hollows are present.

The context of the subject site is also a relevant consideration in assessing its value or relevance for the Powerful Owl (or other threatened fauna species). The subject site is located towards the southern extremity of a broad wedge of forested lands (extending for several kilometres to the north), much of which is likely to provide suitable habitat and resources for the Powerful Owl (Plate 1). Given the constraints on the subject site and on vegetated land in the immediate vicinity provided by residential development to the east and cleared agricultural lands to the west (Plate 2), and given the nature and condition of

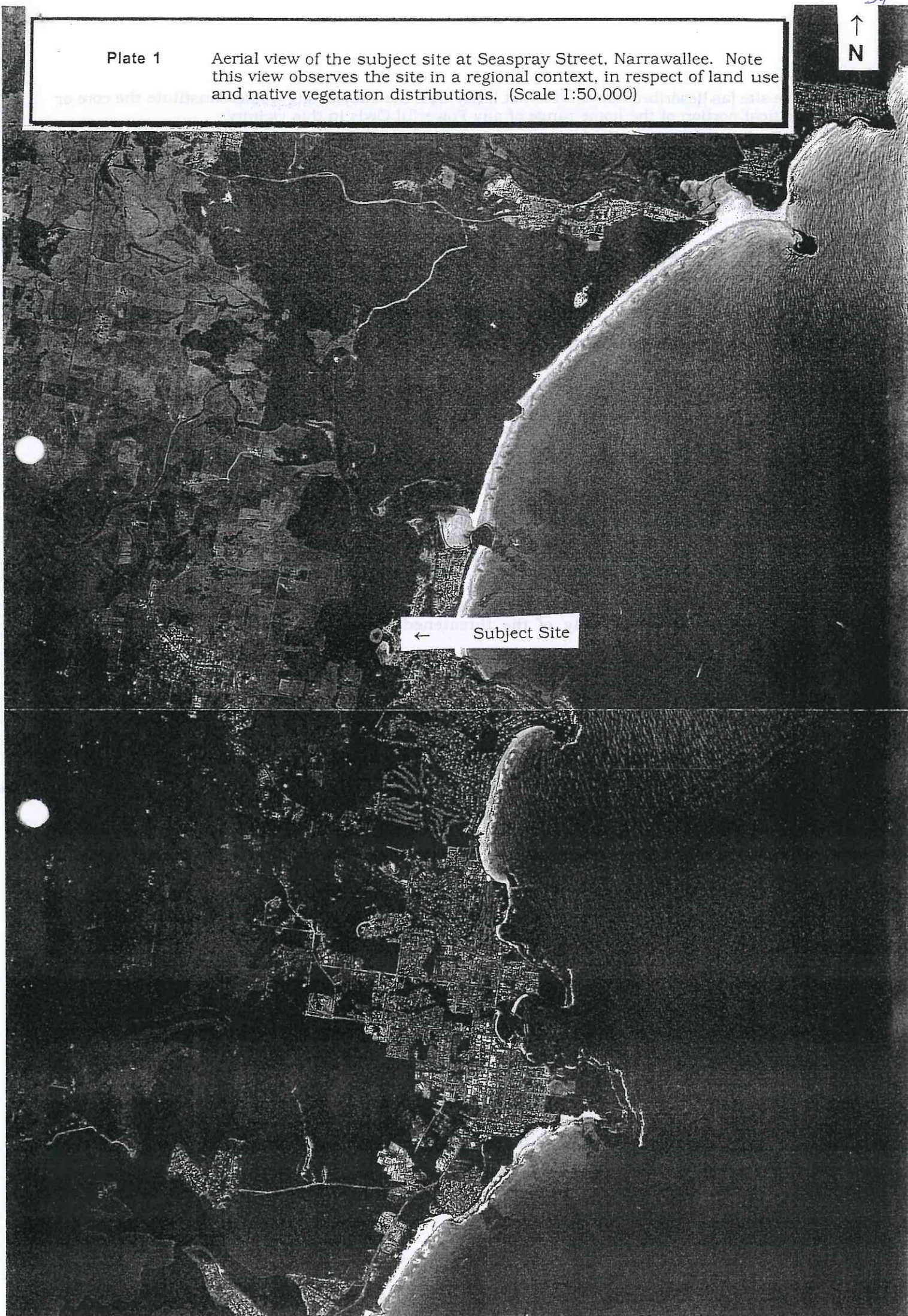
Plate 1

Aerial view of the subject site at Seaspray Street, Narrawallee. Note this view observes the site in a regional context, in respect of land use and native vegetation distributions. (Scale 1:50,000)

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Subject Site



the site (as described above), it is not likely that the subject site would constitute the core or critical portion of the home range of any Powerful Owls in this vicinity.

To the south, forested land is disrupted by an area of totally cleared land (within 3.5km), which further isolates the subject site (Plate 2). It is more likely that the subject site constitutes part of the southern portion of the home range of a Powerful Owl or a pair of Powerful Owls, although individuals could doubtless also use the vegetated strip to the south.

Given its large size and high mobility, and its apparent tolerance to some levels of habitat disturbance, it is likely that Powerful Owls disperse through partly urbanised areas or over open paddocks in the area.

2.3 Other Threatened Fauna Species

Several other threatened fauna species have been recorded on the subject site or could potentially occur, particularly those associated with open forest and woodland habitat. Relevant species in this regard include the Yellow-bellied Glider and Squirrel Glider, and an array of microchiropteran bats, as well as the Koala. No direct or indirect evidence for the Koala or Gliders has been obtained from the subject site, and neither scats of these species nor chew-marks of the Yellow-bellied Glider have been recorded on the site. Development of the site is not regarded as of concern for any of these arboreal animals.

With respect to microchiropteran bats, a number of threatened species are known to occur in the Jervis Bay region, most of which could utilise the site for foraging purposes, at least. A number of microchiropteran bat species could also roost on the site, given the presence of an array of suitable tree-hollows.

The proposed development of the subject site, however, is not regarded as "*likely*" to impose "*a significant effect*" on any of the threatened fauna species known from the site or locality, given:

- the small area of habitat to be affected compared to that present in the immediate vicinity and in the locality;
- the wide-ranging nature of the species, enabling individuals of most species to forage over hundreds or thousands of hectares in an evening;
- the lack of resources or habitat features of particular significance or restricted distribution; and
- the retention of a substantial proportion of the subject site (along the creekline), which will enable individuals of the threatened microchiropteran bats which may occur to continue using the site, if they currently do so.

2.4 Potential Impacts

Development of the subject site as proposed includes the retention of a broad swathe of open forest along the western side of the subject site, protected by a "*Restriction as to User*" covenant over the western portions of the site. This approach will retain most of the vegetation along the creekline, and those resources which have been identified as potentially or theoretically of value to the Powerful Owl, which are concentrated along the western and northern boundaries of the subject site. Retention of that vegetation, as well as of other vegetation around it, will also contribute to continuation of the movement corridor for Powerful Owls in this vicinity, assuming that the open forest present provides such a function.

It is not regarded as likely that the proposed development of the subject site will impose "*a significant effect*" upon the Powerful Owl, given that:

- the Powerful Owl is tolerant of some habitat modification and disturbance;
- the species is wide-ranging and highly mobile, and occupies large home ranges;
- the subject site only comprises a small proportion of the home range for a single pair of Powerful Owls;

Plate 2

Aerial view of the subject site at Seaspray Street, Narrawallee. Note this view observes the site in a local context, in respect of land use and native vegetation distribution. (Scale 1:16,000)

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- there are no breeding resources present on the subject site, although Powerful Owls could utilise the site for foraging and roosting;
- Powerful Owls are clearly tolerant of some levels of disturbance, including urban and residential development;
- a significant proportion of the subject site is to be retained in a natural vegetated state, subject to a Restriction as to User over the western portions of large allotments in the western part of the site; and
- the proposed development will retain a vegetated band along its western side and to the north and south, permitting the ready movement of Powerful Owls in this area if required.

Given that the proposed development is not likely to affect the breeding success of any Powerful Owls which occur in the vicinity, that the subject site constitutes only a very small proportion of the home range of the Powerful Owl, and that relevant resources and habitat are to be retained, it is not considered "*likely*" that the proposed development of the subject site will impose "*a significant effect*" on the Powerful Owl or its habitat.

3 ENVIRONMENTAL MANAGEMENT

A portion of the subject site has been nominated as suitable for development² on the basis of the constraints discussed above. The location of the recommended development area for this proposal at Narawallee is based on the nature and condition of the local environment on the site and throughout the region, and development activities on all of the proposed lots is unconstrained outside of the area nominated as 'Restriction as to User', with respect to ecological and conservation matters. Land beyond the identified development area may also be unconstrained, but would require further investigation as part of any subsequent Development Application.

The nominated development areas are regarded as suitable for construction activities as the subject site has experienced past clearing and under-scrubbing of vegetation, which has resulted in an irregular distribution of remnant trees and regrowth. The soils are relatively well drained, skeletal and sandy in nature, and would be of low viability for agricultural activities, but are suitable for dwelling construction.

The proposed rezoning and combined residential subdivision and development (Part lot 28 DP 871790) at Seaspray Street, Narawallee, will (in some areas) involve the clearance of some vegetation associated with the nominated development area (which would include a bushfire hazard reduction zone). However, the majority of the site will remain relatively unaltered, and activities are recommended to be confined within the identified suitable development area on the site.

Development activities in general have the potential to impose indirect impacts on native biota and environments in the vicinity. Potential or theoretical impacts which could be imposed include those associated with increased residential/urban runoff (*eg* erosion and sediment loss, increased nutrient loading, pollution from oil, grease or petrol, rubbish, detergent and fertilisers), and the increased presence of humans in the area (*eg* increased noise, light, predation from domestic pets and the trampling of vegetation and habitats to be retained).

However, a range of suggested environmental management measures and protocols are included to avoid or reduce potential impacts arising from any future Development Application for a dwelling house on each lot created by the proposal.

Whilst it is not considered likely that the proposal will impose significant adverse impacts on any native biota, a number of impact amelioration guidelines are recommended for application to any subsequent Development Application for dwellings and associated development activities on the subject site, wherever possible:

² All lands east of the 'Restriction as to User' boundary as contained within the subject site.

- the inspection of any hollow-bearing trees prior to their removal³. Where animals are found, they should be encouraged to leave, or captured for release. Nocturnal animals should be released on dusk. Injured fauna should be transferred to the care of WIRES, or a WIRES recommended veterinarian⁴;
- the removal of hollow-bearing trees or stags in as intact a condition as possible. These should be placed in nearby bushland or areas of vegetation to be retained (ie. west of the 'Restriction to User' boundary), or provided for bushland regeneration elsewhere if possible, to provide potential habitat for terrestrial fauna;
- if practicable, large logs which are produced from clearing activities should be left on site to provide additional fauna habitat for ground dwelling species and to maintain soil nutrient cycling;
- the destruction of weeds on-site, or the removal of weed material and its disposal at a Shoalhaven City Council approved waste disposal site;
- the implementation of appropriate sediment control measures during the construction phase of the development (eg silt fences, sediment ponds), to protect terrestrial and aquatic habitats downstream. These should conform to Managing Urban Stormwater guidelines prepared by the Department of Land & Water Conservation (or other relevant guidelines or standards set by Shoalhaven City Council), should be maintained throughout the construction period and should be carefully removed or maintained and re-engineered following completion of the works;
- appropriate management of construction wastes should be employed to prevent any accidental discharge of chemicals, concrete truck washings or other pollutants into areas of adjacent native vegetation or the catchment of the nearby wetland; and
- protection of retained vegetation during clearing and construction activities by using tree guards and temporary fencing, as appropriate.

4 CONCLUSIONS

The proposed rezoning, subdivision and development of the subject site at Narawallee is not regarded as "likely" to impose "a significant effect on threatened species, populations or ecological communities, or their habitats", given that:

- the site has been subjected to some previous disturbance, and does not support habitat features or resources of particular significance or restricted distribution;
- the site constitutes only a small proportion of open forest vegetation in the vicinity and locality, and is already somewhat constrained by residential developments to the east and open agricultural lands to the west;
- the site is not regarded as providing particular habitat or resources for any individual threatened species;
- no threatened species are considered likely to be dependent solely or particularly on the site for their survival in the locality; and
- a substantial proportion of the subject site (along its western side) is to be retained in a vegetated condition as the result of a Restriction as to User placed over the western allotments, and incorporating the creekline and vegetation within and adjacent to it. That approach will retain a substantial area of forest and habitat on the subject site for use by threatened species which may currently occur.

³ Note: no significant hollow-bearing trees were identified within the nominated development area.
⁴ Wildlife Information and Rescue Service (WIRES) - Head Office 02-99751633.

BIBLIOGRAPHY

- Braithwaite R. 1995. Southern Brown Bandicoot *Isodon obesulus*. In Strahan R. (ed). *The Mammals of Australia*. Reed Books, Chatswood.
- Chafer CJ. 1992. Observations of the Powerful Owl *Ninox strenua* in the Illawarra and Shoalhaven Regions of New South Wales. *Australian Bird Watcher*, 14(8): 289-300.
- Clout MN. 1989. Foraging Behaviour of Glossy Black Cockatoos. *Australian Wildlife Research* 16: 467-473.
- Coombes D. 1998. *Powerful Owl (Ninox strenua) & Glossy Black-Cockatoo (Calyptorhynchus lathami) Nesting Assessment: Part Lot 28, DP 871790 Seaspray Street, Narrawallee, City of Shoalhaven*. Unpublished Report, David Coombes, Culburra Beach.
- Cowman Stoddart Pty Ltd. 1994. *Application for Rezoning at Narrawallee Inlet*. Cowman Stoddart Pty Ltd, Nowra.
- Cronin L. 1991. *Key Guide to Australian Mammals*. Reed Books, Balgowlah.
- Daly G, Gosper C and German P. 1998. *Fauna Assessment - Cudmirrah and Conjola Region, Shoalhaven City*. Unpublished Report. Gaia Research Pty Ltd, Nowra.
- Davy S. 1993. Notes on the Habitat of Four Australian Owl Species. In: Olsen P (ed). 1993. *Australian Raptor Studies: Proceedings 10th Anniversary Conference Australian Raptor Association Canberra, September 21-22, 1989*. Australian Raptor Association, Canberra.
- Debus S and Chafer C. 1994. The Powerful Owl (*Ninox Strenua*) in New South Wales. *Australian Birds*, 28 (supplement)
- Debus S. 1993. The Mainland Masked Owl *Tyto novaehollandiae*. *Australian Bird Watcher* 15(4): 168-191.
- Dwyer PD 1966. The population pattern of *Miniopterus schreibersii* (Chiroptera) in northern NSW. *Australian Journal of Zoology*. In Strahan R (ed). *The Australian Museum Complete Book of Australian Mammals*. Angus & Robertson Publishers, Sydney.
- ERIC. 1998. *1:100,000 City of Shoalhaven. 29 Class Landcover Map*. Environmental Resource & Information Centre, Canberra.
- Foreshaw JM and Cooper. 1981. *Australian Parrots*. 2nd Edition. Lansdowne Editions, Melbourne.
- Frith HJ (ed). 1977. *The Reader's Digest Complete Book of Australian Birds*. Reader's Digest Services Pty Ltd, Sydney.
- Garnett S (ed). 1992. *Threatened and Extinct Birds of Australia*. RAOU Report No 82. York Press, Richmond.
- Goldingay R. 1990. Socioecology of the Yellow-bellied Glider, *Petaurus australis*, at Waratah Creek, NSW. *Australian Journal of Zoology* 38: 327-341.
- Hall LS and Richards GC. 1979. *Bats of Eastern Australia*. Queensland Museum Booklet No 12.
- Henry SR and Craig SA. 1984. Diet, ranging behaviour and social organisation of the Yellow-bellied Glider (*Petaurus australis* SHAW) in Victoria. In Smith AP and Hume ID (eds) *Possums and Gliders*, Australian Mammal Society, Sydney.
- Higgins PJ and Davies SJF (eds). 1996. *Handbook of Australian, New Zealand and Antarctic Birds. Volume 3 - Snipe to Pigeons*. Oxford University Press, Melbourne.
- Hindwood KA. and Sharland M. 1964. The Swift Parrot. *The Emu*, 63(4): 310-326.
- Hyett J and Shaw N. 1981. *Australian Mammals - A field guide for New South Wales, Victoria and Tasmania*. Thomas Nelson Australia, Melbourne.
- Lavazanian E, Wallis R and Webster A. 1994. Diet of Powerful Owl (*Ninox strenua*) Living Near Melbourne, Victoria. *Wildlife Research* 21(6): 643-646.
- Lindsey T. 1992. *Encyclopedia of Australian Animals - Birds*. Angus & Roberston, Sydney.
- Mackowski CM. 1988. Characteristics of eucalypts incised for sap by the yellow-bellied glider, *Petaurus australis* SHAW (Marsupialia: Petauridae) in north-east New South Wales. *Australian Mammalogy* 11:5-13.

- McNabb EG. 1996. Observations on the biology of the Powerful Owl *Ninox strenua* in Southern Victoria. *Australian Bird Watcher* 16: 267-295.
- Mills K. 1993a. *The Natural Vegetation of the Jervis Bay Region of New South Wales* University of Wollongong.
- Mills K. 1993b. *Rare plants and Animals in the Shoalhaven*. Kevin Mills & Associates, Jamberoo.
- Mills K. 1994. *Preliminary Flora and Fauna Assessment Land at Narrawallee Shoalhaven*. Kevin Mills and Associates Pty Ltd, Jamberoo.
- Mills K. 1998a. *Flora and Fauna Study Part Lot 28, DP 871790 Seaspray Street, Narrawallee, City of Shoalhaven*. Kevin Mills and Associates Pty Ltd, Jamberoo.
- Mills K. 1998b. *Supplementary Information Flora and Fauna Study Part Lot 28, DP 871790 Seaspray Street, Narrawallee, City of Shoalhaven*. Kevin Mills and Associates Pty Ltd, Jamberoo.
- Moore G. 1995. *Rezoning Application Lot 7 DP 841139, Seaspray Street, Narrawallee, City of Shoalhaven*. George E Moore, Birkenhead Point.
- National Parks & Wildlife Service. 1996. *Consideration of the potential impact of the proposed development at Long-Bow Point on threatened fauna*. Threatened Species Unit, Southern Zone, Queanbeyan. Unpublished Report.
- Pavey CR, Smith AK and Mathieson MT. 1994. The Breeding Season diet of the Powerful Owl *Ninox strenua* at Brisbane, Queensland. *Emu* 94(4): 278-284
- Pavey CR. 1995. Food of the Powerful Owl *Ninox strenua* in Suburban Brisbane, Queensland. *Emu* 95(3): p231
- Pyke GH and White AW. 1996. Habitat requirements for the Green and Golden Bell Frog *Litoria aurea* (Anura: Hylidae). *Australian Zoologist* 30(2): 224-232.
- Quinn D. 1993. Nesting Powerful Owls. *Australasian Raptor Association News* 14: 70-71.
- Richardson EG. 1977. The biology and evolution of the reproductive cycle of *Miniopterus schreibersii* and *M. australis* (Chiroptera: Vespertilionidae). In Strahan R (ed). 1991. *The Australian Museum Complete Book of Australian Mammals* pp336-337. Angus & Robertson Publishers, Sydney.
- Russell R. 1980. *Spotlight on Possums*. University of Queensland Press, Brisbane.
- Schodde R and Mason I. 1980. *Nocturnal Birds of Australia*. Landsdowne Editions, Melbourne.
- Schulz M. 1997. The Diet of the Powerful Owl *Ninox strenua* in the Rockhampton Area. *Emu* 97(4): 326-328.
- Shoalhaven City Council and Monaro Consultants. 1996. *Milton - Ulladulla Structure Plan: Volume 1 Strategy*. Monaro Consultants Pty Ltd, Yarralumla.
- Shoalhaven City Council and Monaro Consultants. 1996. *Milton - Ulladulla Structure Plan: Volume 2 Background Study*. Monaro Consultants Pty Ltd, Yarralumla.
- Shoalhaven City Council. 1985. *Draft Local Environmental Plan*. Shoalhaven City Council, Nowra.
- Shoalhaven City Council. 1996. *Draft Local Environmental Plan, 1:25,000 Map Sheet*. Shoalhaven City Council, Nowra.
- Shoalhaven City Council. 1996. *Milton - Ulladulla Structure Plan, Community Consultation Brochure*.
- Shoalhaven City Council. 1998. *Local Environmental Plan 1985 with Amendments*. Shoalhaven City Council, Nowra.
- Shoalhaven City Council. 1999. *Review of Impacts on Powerful Owl by Proposed Residential Rezoning, Seaspray Street, Narrawallee*. Shoalhaven City Council, Nowra.
- Strahan R. 1995. *The Australian Museum Complete Book of Australian Mammals*. Angus & Robertson Publishers, Sydney.
- Tilley S. 1982. The Diet of the Powerful Owl, *Ninox strenua*, in Victoria. *Emu* 9(1): p157.
- Total Environment Centre. 1983. *Our Wildlife in Peril*. AH & AW Reed Pty Ltd, Sydney.

- Traill B. 1993. The Diet and Movements of a Pair of Powerful Owls *Ninox strenua* in Dry Forest. In: Olsen P (ed). 1993. *Australian Raptor Studies: Proceedings 10th Anniversary Conference Australian Raptor Association Canberra, September 21-22, 1989*. Australian Raptor Association, Canberra.
- Webster A, Cooke R, Jameson G and Wallis R. 1999. Diet, Roosts and Breeding of Powerful Owls *Ninox strenua* in a disturbed, urban environment: a case for cannibalism? Or a case of infanticide? *Emu* 99(1): 80-83.
- White AW. 1996. The Green and Golden Bell Frog *Litoria aurea*. In Ehmann H (ed) *Threatened Frogs of New South Wales: Habitats, Status and Conservation*. Frog and Tadpole Study Group of NSW, Sydney.