

purposes has been particularly cognisant of those relevant threatened biota, both in the investigations conducted for the *Nowra-Bomaderry Structure Plan* (as endorsed by SCC and the DoP) and in the investigations undertaken for this *Report* for the proposed development of the subject land. Of particular relevance in this regard are the Nowra Heath-myrtle, Yellow-bellied Glider, Glossy Black Cockatoo and relevant or potentially relevant habitats and resources (such as hollow-bearing trees and specific food trees).

The most important habitat for the Nowra Heath-myrtle on the subject land (in the northern and eastern sections of the site), and the overwhelming majority of the population of the species, are to be retained and protected. This outcome is to be achieved by their inclusion in the *E2 – Environmental Conservation Zone* and by the implementation of a *Vegetation Management Plan* for the *E2 – Environmental Conservation Zone* with specific measures to enhance the survival of the species. As a consequence, it is not likely that the population of this species would be so adversely affected by the proposed development as to render the “local population” of that species “at risk of **extinction**”.

The majority of suitable habitat for the Yellow-bellied Glider is also contained within the proposed *E2 – Environmental Conservation Zone* in the northern and eastern parts of the subject site, particularly in the northeast. It is not likely that individuals of that species would be adversely affected by the proposed development of the land such that the “long-term viability” of that species and/or the “local population” of the species would be adversely affected.

Only very small areas of potential foraging habitat and resources for the Glossy Black Cockatoo will be removed for the proposed development of the subject land. In this regard, there are substantial foraging resources within the *Conservation Area* on the subject land and on adjoining lands, and the Glossy Black Cockatoo (in any case) is highly mobile and wide-ranging, and is abundant in the Shoalhaven LGA.

Similarly, most of the suitable foraging resources and habitat of particular value for microchiropteran bats will be retained within the *E2 – Environmental Conservation Zone*. In addition to the habitat retained within the *E2 – Environmental Conservation Zone*, there are a substantial suitable foraging habitat and roosting resources through the general locality, which will ensure that individuals of those species are not so affected as to reduce the “viability” of any local populations.

Given the considerations above, and the implementation of an appropriate management regime within the *E2 – Environmental Conservation Zone* on the subject land at Mundamia, it is the opinion of the authors of this *Report* that development of the subject land as proposed, with its integrated impact amelioration and environmental management measures, does not represent an activity likely to have a significant adverse impact upon either “individual animals and/or plants and/or subpopulations” of threatened biota or on “the long-term viability of the [any] species, population, or ecological community”.

It should be noted that the *Nowra-Bomaderry Structure Plan*, which was the result of a substantial investigation and analysis *inter alia* with respect to threatened biota on behalf of Shoalhaven City Council (SCC), had determined that Mundamia was an appropriate location for residential development. Those investigations and the subsequent *Structure Plan* (which have been endorsed by SCC and the then DoP) had concluded that the likely impacts on threatened biota were not such as to preclude development *inter alia* of the subject land for residential purposes. Indeed, the *Nowra-Bomaderry Structure Plan* recommends *inter alia* residential development of the subject site at Mundamia.

#### 14.4.3 Importance of Habitat Features

Most of the relevant habitats and habitat features on the subject land at Mundamia have been retained in the *Conservation Area* within the northern and eastern parts of the land. The following habitat features are to be substantially retained and managed in the *E2 – Environmental Conservation Zone*:

- the majority of nesting and foraging habitat for the Yellow-bellied Glider;
- the majority of foraging and potential nesting resources for the Glossy Black Cockatoo;
- the overwhelming majority of individuals of and habitat for the Nowra Heath-myrtle, particularly as a result of the re-design of the northern part of the proposal; and
- most of the hollow-bearing trees within the forest communities.

Parts of the areas of the subject site at Mundamia which are proposed for development activities support some of the vegetation types and habitat resources which are present in the *E2 – Environmental Conservation Zone* on the land. However, the development area does not contain significant or important habitat or resources that will not be retained within the *E2 – Environmental Conservation Zone*. Further, many of those habitats and habitat features which are to be removed have been modified or disturbed, in any case.

The array of investigations which have been undertaken on the subject land demonstrate that the development will not involve the removal of any wildlife habitats or the loss of any resources which are regarded as of particular “importance” for any native, including threatened, species. In addition, the long-term management of the *E2 – Environmental Conservation Zone* will ensure that the relevant “habitat features” of the subject land are retained and protected for biodiversity purposes. That situation constitutes a significant net environmental benefit over current circumstances.

The biodiversity conservation value of various habitat features and resources, both on the subject site itself and in its immediate vicinity, have been considered in determining the appropriate development footprint of the subject land at Mundamia. In addition, those matters and features had been taken into account in the *Nowra-Bomaderry Structure Plan* (as adopted by SCC and endorsed by the then DoP), which determined *inter alia* that development of the subject land, essentially as now proposed, was an appropriate outcome.

On the basis of the various investigations which have been undertaken on the subject site (by SCC, BES/ELA, Environmental InSites and SLR Ecology), an appropriate balance between sensible development opportunities and the conservation of important habitat features has been achieved.

#### 14.4.4 Duration of Impacts

In respect of those parts of the subject land proposed for development, the impacts (in terms of the removal of habitat and resources) will obviously be permanent. The relevant issues, therefore, are:

- whether those impacts are acceptable; and
- whether additional permanent or long-term impacts will be imposed on adjoining habitats.

The proposed development of the subject land at Mundamia has been designed, and is to be undertaken, in an environmentally sensitive manner. The *Concept Plan* has been designed *inter alia* to

avoid the imposition of long-term adverse impacts upon the retained natural environment on the subject land and/or upon adjoining habitats and resources for native (including threatened) biota.

Implementation of the design features of the proposal, and of the *Vegetation Management Plan* (VMP) within the retained portions of the land would ensure that the areas of land to be retained, protected and enhanced are not adversely affected in either the short-term or the long-term.

As discussed above with respect to various matters, the *Nowra-Bomaderry Structure Plan* (which has been adopted by SCC and which was endorsed by the then DoP) has identified the subject site *inter alia* for development purposes. That analysis and assessment (by SCC and the then DoP) had taken into account and considered the likelihood of ongoing impacts of urban development, and clearly had concluded that, on balance, development of the subject land was appropriate.

As also discussed in some detail above, the proposed development of the subject land at Mundamia has, *inter alia*:

- addressed the importance and/or significance of adverse impacts which might be imposed upon the natural environment;
- been designed specifically to limit or ameliorate those potential adverse impacts;
- been modified and amended in an iterative process that has been sensitive to the environmental constraints of the land;
- involved a development design which predominantly uses previously modified and/or disturbed degraded areas of the subject land for residential purposes; and
- deliberately and specifically incorporates a range of impact amelioration and environmental management measures designed in particular to minimise or limit adverse impacts upon the natural environment, and upon threatened biota and their habitats.

Those outcomes reflect the expectations contained within the *Nowra-Bomaderry Structure Plan* (as adopted by SCC and endorsed by the then DoP), and in the *South Coast Regional Strategy* (recently promulgated by the DoP/DPI).

#### 14.4.5 Permanent and Irreversible Impacts

As with “*cumulative impacts*”, the impacts upon habitats and resources within the development footprint of the subject land at Mundamia will be “*permanent and irreversible*”. That is an inevitable, and obvious, consequence both of the proposal and of the considerations contained in the *Nowra-Bomaderry Structure Plan* (as adopted by SCC and endorsed by the DoP), and is a matter which had been taken into account by those authorities. Further, that matter has been taken into consideration in addressing the significance of the likely or potential impacts of the proposed development on the natural environment in general, and on threatened biota in particular, as documented in this *Report*.

In respect of both the “*duration of impacts*” and the imposition of “*permanent or irreversible impacts*”, the proposed development design has been cognisant of the ecological constraints imposed by important elements of the environment on the subject land, and adjacent to it. The project has:

- identified areas of relatively ‘*high conservation*’ value;
- confined the proposed development to those areas which are of lesser conservation significance or value; and
- incorporated an array of environmental management and impact amelioration measures (see Chapter 17) which are designed specifically to avoid the imposition of adverse impacts upon retained natural vegetation and habitats, both on the subject land itself and in the immediate vicinity.

The only threatened plant species present on the subject land is the Nowra Heath-myrtle, which is addressed in Chapters 4, 6 and 7 of this *Report*. The majority of the population of and habitat for this species is being conserved with the *E2 - Environmental Conservation Zone* (Figure 7). Further, the stormwater bioretention swales have been designed to minimise any effect on this species in the northeastern portion of the land. That approach will both protect individuals of the species, and ensure the maintenance of soil moisture conditions necessary for its survival.

Relevant threatened fauna species are addressed in Chapters 5 and 6 of this *Report*. Whilst the proposed development will doubtless remove some areas of habitat for a number of threatened fauna species, no such species would be confirmed to the proposed development area. The relevant threatened fauna are highly mobile and wide-ranging and/or are widely distributed in the locality, including on adjoining lands. Thus, adverse impacts on those species will be localised and limited, given the extent of habitat in the locality.

There are no “*threatened ecological communities*” or “*ecological populations*” present, and no *Recovery Plans* are of relevance to the land or the threatened biota which are known or likely to be present.

#### 14.5 DECC Assessment of Significance Guidelines 2007

The *Threatened Species Assessment Guidelines: The Assessment of Significance* (DECC Aug 2007) provide guidance in the application of Section 5A of the EP&A Act in determining whether a “*significant effect*” is “*likely*” to be imposed upon threatened biota or their habitats.

Whilst Section 5A does not apply to Part 3A applications, the relevant considerations regarding the potential for impacts to be imposed on threatened biota and/or their habitats have been taken into account in the assessments contained in this *Report*.

## 15 SEPP 44 – KOALA HABITAT PROTECTION

### 15.1 Application of SEPP 44

*State Environmental Planning Policy No. 44 - Koala Habitat Protection* (SEPP 44) aims to protect the Koala and its habitat by identifying matters for consent authorities to consider during the assessment of relevant *Development Applications* (DAs) or proposals. In particular, SEPP 44 contains definitions of “*potential koala habitat*” and “*core koala habitat*” to be applied in the consideration of developments within those Local Government Areas (LGAs) listed in Schedule 1 of the *Policy*.

The Shoalhaven LGA is listed in Schedule 1 of SEPP 44 as an area to which the *Policy* applies, and the subject land is greater than 1ha in area. Consequently, SEPP 44 applies (at least theoretically) to the subject land.

### 15.2 Potential Koala Habitat

SEPP 44 defines “*potential koala habitat*”, as native vegetation in which trees listed in Schedule 2 of the SEPP “*constitute at least 15% of the total number of trees in the upper or lower strata of the tree component*”.

Schedule 2 of SEPP 44 provides a list of tree species which are recognised as food trees utilised by the Koala. Only one of the relevant tree species is present on the subject land at Mundamia (the Grey Gum *Eucalyptus punctata*), but this species does not constitute more than 15% of the “*tree component*” of the forested parts of the land. As a consequence, the subject land does not constitute “*potential koala habitat*”, as defined in SEPP 44.

### 15.3 Core Koala Habitat

SEPP 44 defines “*core koala habitat*”, as “*an area of land with a resident population of koalas, evidenced by attributes such as breeding females (that is, females with young) and recent sightings of and historical records of a population*”.

There are no recent records of Koalas on the subject land or in the locality. There is, consequently, no “*resident population*” of Koalas. The subject land cannot therefore constitute “*core koala habitat*”.

### 15.4 Conclusions

The subject land does not represent “*potential koala habitat*” as defined in SEPP 44, or “*core koala habitat*” as defined in the SEPP. Given those circumstances, there is no requirement pursuant to SEPP 44 for the preparation of a *Koala Plan of Management* (KPoM) for the subject land.

## 16 ENVIRONMENT PROTECTION & BIODIVERSITY CONSERVATION ACT

### 16.1 Introduction

The *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act), of the Commonwealth of Australia, seeks *inter alia*:

- “to provide for the protection of the environment, especially those aspects of the environment that are *Matters of National Environmental Significance*”;
- “to provide ecologically sustainable development”; and
- “to promote the conservation of biodiversity”.

Implementation of the EPBC Act requires *inter alia* consideration as to whether a development or activity is likely to impose a “*significant impact*” on “*Matters of National Environmental Significance*” (MNES), which include:

- listed threatened biota (ecological communities and species);
- alleged “*migratory species*” listed in international treaties (JAMBA, CAMBA, the Bonn Convention);
- actions relating to “*nuclear activities*”;
- actions on Commonwealth lands or Commonwealth marine areas;
- actions in or affecting RAMSAR Wetlands; or
- activities in or which affect World Heritage sites.

### 16.2 Relevant EPBC Act Considerations

The proposed development of the subject land at Mundamia will have no relevant effect with respect to nuclear activities, Commonwealth lands, World Heritage properties, Ramsar wetlands or the Commonwealth marine environment.

A search of the EPBC Act website for *Matters of National Environmental Significance* (MNES) has identified an array of items listed on the EPBC Act within 10km of the subject land (Appendix D). However, the overwhelming majority of those MNES are of no relevance to the subject land, or the proposed development thereon, because either:

- many of the MNES are distant from the subject land and will not be affected in any way;
- there is no habitat of any relevance present for most of the listed threatened species or ‘migratory’ species listed;
- the proposal will have no impact upon the species or their habitats (eg in the case of “*listed marine species*”); and/or
- there is no evidence for, and little likelihood that, even individuals of most of those species would occur on the subject land.

The Grey-headed Flying Fox, which was recorded flying over the subject land (BES 2004a), is listed as “*Vulnerable*” on the EP&A Act, and four other species listed as “*Migratory*” on the EPBC Act have also been recorded on the land (Appendix D).

Although it is possible that development of the subject land could affect some individuals of some species which are listed as “*migratory*” on the EPBC Act, it should be noted that:

- many of those species are not in fact “*migratory*” at all, but are listed on international agreements regarding “*migratory*” species (eg the Cattle Egret and the White-bellied Sea Eagle); and
- the area of land to be affected by the proposed development constitutes either a minute fraction of that available in the locality for those species or, in some instances, does not represent preferred habitat at all.

All of the fauna species which either are or could potentially be of relevance with respect to the EPBC Act are highly mobile and wide-ranging. Many are migratory or nomadic, and none (other than individuals of extremely common and cosmopolitan species such as the Masked Lapwing) would reside in or be dependent on those portions of the subject land proposed for development.

Further, that part of the subject land proposed for development activities does not constitute a significant element of the potential resources for any individuals of the species listed on the EPBC Act within their normal home ranges. It is not likely that even an individual of any such species would be reliant on or dependent on those parts of the subject site proposed for development activities for their survival, even on a local basis (again with the exception of abundant and cosmopolitan species of no conservation concerns, such as the Masked Lapwing).

The subject land supports a substantial population of the endangered Nowra Heath-myrtle *Triplarina nowraensis*. This species occurs predominantly in the northern part of the subject land but also as scattered small patches of individuals in the northeastern part of the land.

The proposed development has been re-designed to reduce the extent of residential development in the northern parts of the land so as to ensure the retention and protection of the overwhelming majority of the species. The re-design has reduced the loss of specimens and/or habitat for the Nowra Heath-myrtle so that well in excess of 90% of the known specimens and their distribution on the subject land are now to be retained. In addition, as discussed elsewhere, management of the *Asset Protection Zones* (APZs) and of relevant parts of the *Conservation Area* on the subject land will include measures designed specifically to increase the population by selective thinning of understorey vegetation, which appears to stimulate growth of the Nowra Heath-myrtle.

Given the re-design of the proposed development to retain the overwhelming majority of the Nowra Heath-myrtle, and appropriate management of the *Conservation Area* to enhance habitat for and populations of the species, the proposed development will not involve the imposition of a “*significant impact*” on the Nowra Heath-myrtle.

A “*critically endangered*” plant species has also been recorded in the immediate vicinity. The Spring Tiny Greenhood orchid *Speculantha vernalis* has been recorded at a number of sites around the subject land, but has not been recorded on the subject land itself. Dedicated searches by officers from Shoalhaven City Council (SCC) as well as the authors of this *Report* in potentially suitable habitat did not identify even a single specimen of the Spring Tiny Greenhood orchid on the subject land. It is noted this species was recorded flowering in suitable habitat to the southeast and west of the subject land at the same time.

Given those circumstances, there will be no “*significant impact*” imposed upon the Spring Tiny Greenhood as a result of the proposed development of the subject land at Mundamia.

There is no likelihood of a “*significant impact*” being imposed on any biota listed in the EPBC Act as a result of the proposed development of the site at Mundamia.

### 16.3 SEWPaC Decision

It is the conclusion of the EPBC Act assessment contained in this *Report* that the proposed subdivisions and development of the site at Mundamia is not “*likely*” to impose a “*significant impact*” upon any MNES.

The proposal, nevertheless, has been referred to the Commonwealth Department of Sustainability, Environment, Water, Population & Communities (SEWPaC). The Department has determined that the proposed development is not a “*Controlled Action*” pursuant to the EPBC Act (Appendix G), and that consequently no approval from the Federal Minister for the Environment is required.

### 16.4 Conclusions

The potential or likelihood of the proposed subdivision and subsequent development of the subject land at Mundamia to impose a “*significant impact*” upon any MNES has been considered by the authors of this *Report*.

Given the extent of habitat and resources to be retained and protected within the *E2 – Environmental Conservation Zone*, and given the nature and condition of those parts of the subject land which have been proposed for development activities, it is not likely that a “*significant impact*” would be imposed upon any MNES as a consequence of the proposed development of the subject land.

As noted above, a *Referral* was made to the Commonwealth Department of Sustainability, Environment, Water, Population & Communities (SEWPaC), which has concluded that the proposed development is not a “*Controlled Action*” pursuant to the EPBC Act (Appendix G), and that consequently an approval from the Federal Minister for the Environment is not required.



The *Nowra-Bomaderry Structure Plan* was adopted by Shoalhaven City Council (SCC) on the 24<sup>th</sup> of October 2006, and endorsed by the then Department of Planning (DoP), now the Department of Planning & Infrastructure (DP&I), on the 26<sup>th</sup> of February 2008.

As indicated at the beginning of that document, the *Nowra-Bomaderry Structure Plan* “*is not a legal planning document but rather one that provides strategic direction and guidance*”. Nevertheless, the *Structure Plan* does identify areas that are considered appropriate by SCC and the DoP for future residential purposes (amongst other things), which had been identified through a process of investigation and survey prior to adoption of the *Structure Plan*.

The identification of lands considered appropriate for residential development activities, as documented in the *Nowra-Boundary Structure Plan*, was based *inter alia* on flora and fauna investigations of the Mundamia area. Those studies (BES 2004) included investigations of the subject land (Chapter 2; Appendix A), which have been supplemented for this *Report*.

The *Nowra-Bomaderry Structure Plan* identifies new living areas within the Nowra-Bomaderry area, included amongst which is the Mundamia area. The eastern part of the area identified as a “*future living area*” at Mundamia corresponds substantially to the development which is proposed and considered in this *Report*.

The *Structure Plan* identifies a number of features of the Mundamia area, and notes *inter alia* that:

- the “*neighbourhood of Mundamia will be a contained area of residential development to the west of Nowra, within an area of abundant native bushland. This is an asset to be preserved and protected as a significant part of the biodiversity and natural processes in the area*”;
- development at Mundamia “*will achieve a high level of environmental performance to ensure the quality of watercourses in close proximity to the neighbourhood, being the Shoalhaven River, Flat Rock Dam, Flat Rock Creek, Cabbage Tree Creek and numerous tributaries into the creeks*”; and
- the “*neighbourhood will achieve a considered balance between urban development and the protection of environmentally significant areas. Threatened species and valuable ecological communities will be retained and protected through appropriate land use zones, continuous riparian corridors, stormwater and drainage management. The natural bushland adjoining the neighbourhood will be conserved*”.

The proposed residential development of the subject land at Mundamia, addressed in this *Report*, achieves the goals established in the *Nowra-Bomaderry Structure Plan*. As discussed elsewhere in this *Report*, most of the development area is located in areas of previously highly disturbed agricultural land, and the most significant elements of the natural landscape (including threatened biota and their habitats) are to be retained and protected. In addition, the stormwater management regime has been designed *inter alia* to ensure the maintenance of soil moisture conditions and the maintenance of water quality in Flat Rock Creek and the Shoalhaven River.

## 18 IMPACT AMELIORATION and ENVIRONMENTAL MANAGEMENT

### 18.1 Fundamental Assumptions

Appropriate impact amelioration and environmental management measures would be anticipated as a standard feature of any future development of the subject land for residential purposes. This approach has been adopted notwithstanding:

- the degraded nature and condition of most of the development area on the subject land;
- the lack of unique or restricted resources or habitat features of particular relevance for (particularly threatened) native biota, within the proposed development footprint; and
- the retention of substantial areas of habitat within the subject land, and on adjoining lands (eg the Crown Land containing Flat Rock Creek to the immediate east).

It is also a fundamental assumption and approach embodied in this *Report* that, whilst impacts upon the natural environment are doubtless inevitable, it is appropriate to incorporate into both the development design and into the development concept an array of impact amelioration and environmental management measures which are designed *inter alia* to reduce, ameliorate and/or offset impacts upon the natural environment which will inevitably arise.

As discussed elsewhere in this *Report*, it is a fundamental precept of this *Report* that the identification of an appropriate balance between development opportunities and conservation aspirations and goals is required to satisfy both the requirements and expectations for biodiversity conservation in the landscape generally and the requirements (economic, social and recreational) of the local and wider Australian community.

### 18.2 Impact Amelioration

Impact amelioration is the process of incorporating design features and ongoing management measures into a development to limit or minimise potential adverse impacts. Elements of the proposal at Mundamia which have involved the incorporation of impact amelioration measures include:

- the design and the subsequent management of stormwater control features, both during construction activities and following completion and occupation of the land, to limit the potential discharge of contaminants and to maintain existing hydrologic regimes within the *Conservation Area*. These features will be constructed and managed according to current 'best practice' principles, and as outlined in the *Water Cycle Management Report* of Storm Consulting (2012);
- the implementation of 'Water Sensitive Urban Design' principles, including the capture and re-use of stormwater runoff, the treatment of water to be discharged from the development, and the avoidance of the use of potable water for other purposes; and
- detailed design of the peripheral bioretention swale and detention basin system to maintain soil moisture and groundwater regimes, and to provide supplementary habitat for native biota (particularly in the peripheral bioretention swale and detention basin system on the eastern side of the proposal).