

### 13.10 Protection of Aquatic and Riparian Habitats

Item 9.7 of the DGEARs requires:

- information regarding “*measures and safeguards to protect adjacent aquatic habitats*”; and
- “*full details and widths of proposed riparian buffer zones for Flat Rock Creek*”.

#### 13.10.1 Aquatic and Riparian Habitats

As discussed above, the only “*aquatic*” and “*riparian*” habitats present within the subject land itself (Figure 2) are confined to:

- two small farm dams in the agricultural parts of the subject land;
- a large degraded and poor quality ‘sediment’ dam in the southwestern corner of the land; and
- mesic vegetation located immediately adjacent to the small drainage line in the northeastern part of the land.

None of these habitats are regarded as of conservation value or significance. In this regard:

- the ‘sediment’ dam in the southwestern corner of the subject land has essentially no vegetation, and is clearly both artificial and in very poor condition;
- the two small farm dams on the land, being artificial nature are readily re-created. In any case, these two features do not represent significant habitat for any relevant native biota; and
- the small area of riparian vegetation along the upper part of the watercourse in the northeastern part of the subject land is not of particular conservation significance, although this area does support a small part of a stand of the Nowra Heath-myrtle. Conversely, that patch constitutes only a very small proportion of the total population of Nowra Heath-myrtle on the subject land, and the riparian vegetation *per se* is not of particular significance or conservation value.

The proposed development of the subject land at Mundamia will require the removal of the farm dams and the upper part of the riparian habitat in the northeastern part of the subject land. However, those impacts are not regarded as of particular conservation significance because:

- supplementary aquatic habitat will be provided in bio-retention swales associated with the proposal;
- those artificial features will be managed specifically *inter alia* for the provision of habitat for native biota;
- the riparian habitat in the northeastern part of the subject land *per se* is not of particular relevance to any threatened biota, or any other native biota; and
- substantial areas of such habitats and resources (both aquatic and riparian) will be maintained in lands adjoining and surrounding the subject land.

Further, the proposal is not likely to impose significant impacts upon any relevant aquatic or riparian habitats in the immediate vicinity given:

- the distance to any such resources in most instances (*ie* the Shoalhaven River and Flat Rock Creek);
- the presence of intervening 'buffer' areas of native vegetation; and
- the water quality and quantity controls incorporated in the project.

### 13.10.2 Buffers

The need for "*buffers*" between development and retained vegetation is inversely proportional to the care taken in design of the proposal and the adequacy of impact amelioration and environmental management measures applied, as well as to the sensitivity of any habitats or resources likely to be affected. In other words, intelligent design and appropriate management measures minimise the need for "*buffers*"

In this regard, the proposed development incorporates a peripheral road and bio-retention swale system that provides a management interface between the residential development and the *Conservation Area*. This is intended *inter alia* to reduce the likelihood of impacts on the adjoining retained vegetation by:

- providing a physical break between the development and retained vegetation;
- providing for visual monitoring of the interface by residents;
- providing supplementary habitat (in the bio-retention swales) which will also absorb any discharged nutrients; and
- facilitating the appropriate management of vegetation to ensure the amelioration of potential impacts.

In some places (particularly in the southeast and in the north), *Asset Protection Zones* (APZs) are required outside the proposed development footprint. These will be carefully managed *inter alia* to act as "*buffers*" to areas of retained intact bushland on the subject land and on adjoining lands, and to protect habitat features. The areas to be managed for APZs will be carefully maintained to avoid weed incursions or other negative impacts, and will function as "*buffers*" or 'transition zones' into the intact native vegetation of the *Conservation Area*.

No further requirements for the use of 'buffers' are warranted for this proposal. Rather, the development has been designed, and will be constructed, to ensure appropriate management of the potential 'edge effects' which might otherwise be imposed.

The proposed development and management of the proposed *E2 - Environmental Conservation Area* in the eastern and northern parts of the subject land specifically provides for adequate conservation and setbacks to Flat Rock Creek (of 140m-300m). The proposed *Conservation Area* and the retained vegetation in the adjoining land (along Flat Rock Creek) provide a substantial buffer to Flat Rock Creek itself, involving both riparian areas and xeric woodland.

## 13.11 Offsets for Vegetation Clearing

### 13.11.1 The Biodiversity Offset Principles

The NSW Office of Environment & Heritage (OEH), formerly the DECC, prepared a set of *Principles for the Use of Biodiversity Offsets in NSW* as part of its *Guidelines for Biodiversity Certification of Environmental Planning Instruments*. The *Principles* are provided as “a guide for DECC when it is negotiating and developing biodiversity offsets to achieve conservation outcomes in situations where a loss of biodiversity is expected”.

The *Biodiversity Offsets Principles* state *inter alia* that:

*“a biodiversity offset is one or more appropriate actions that are put in place to counterbalance specific impacts on biodiversity. Appropriate actions are long-term management activities to improve biodiversity conservation. This can include legal protection of land to ensure security of management actions and remove threats”.*

There are 13 *Principles* identified in the DECC document intended to guide the use of biodiversity offsets. Those 13 *Principles* are addressed with respect to the proposed development of the subject land at Mundamia below.

### 13.11.2 Proposed Offsets at Mundamia

The Mundamia residential development proposal includes the dedication of 9.49ha of land in two *Conservation Areas*, to be managed predominantly for biodiversity conservation purposes. That area has been increased from the original development design by virtue of a reduction in the northern part of the residential development to protect a greater area of habitat for and specimens of the Nowra Heath-myrtle. That approach has led to the protection of in excess of 95% of the Nowra Heath-myrtle population and habitats on the subject site.

In addition to setting aside the 9.49ha of land predominantly for biodiversity conservation purposes, the proposal will involve the implementation of a *Vegetation Management Plan* in that area, designed to rehabilitating areas of weed-infestation or other disturbance, and to ensure appropriate management of *Asset Protection Zones* (APZs) so as to preserve their biodiversity conservation values.

### 13.11.3 Consideration of Biodiversity Offset Principles

#### **Principle 1      Impacts must be avoided first by using prevention and mitigation measures**

The proposed development at Mundamia has, to the extent of reasonably practicable, avoided impacts on the national environment by:

- concentrating development activities in areas where vegetation has been highly or moderately disturbed or modified;
- reducing the extent of development in the northern part of the site to reduce impacts upon the threatened Nowra Heath-myrtle and its habitat;
- implementing stormwater management measures designed to avoid adverse impacts on adjoining natural native vegetation; and

- identifying specific management measures for APZs intended to maintain biodiversity values and to enhance opportunities for the Nowra Heath-myrtle.

## **Principle 2 All regulatory requirements must be met**

All regulatory and statutory requirements regarding development consent are being addressed in the Part 3A assessment process for the proposal. The offsets which have been identified are not being *“used to satisfy approvals or assessments under other legislation”*.

## **Principle 3 Offsets must never reward ongoing poor performance**

The proposed offsets as part of the Mundamia development project have not, and will not, result in any deliberate degradation or mismanagement of offset areas *“in order to increase the value from the offset”*.

## **Principle 4 Offsets will complement other government programs**

The proposed *Conservation Areas* adjoin an existing Council Reserve which also adjoins the Triplarina Nature Reserve. Thus, dedication of the *Conservation Areas* on the subject land for biodiversity conservation purposes will act to complement the conservation of other lands in the immediate vicinity.

## **Principle 5 Offsets must be underpinned by sound ecological principles**

The ecological values of vegetation on the subject land have been taken into account when determining the final residential subdivision design, and in the management of both APZs for bushfire protection purposes and stormwater discharges.

In addition, the proposed offsets in the *Conservation Areas* on the subject land at Mundamia are *“suitable offsets”*, as they contain relevant *“biodiversity management actions, such as enhancement of existing habitat and securing managing land of conservation value for biodiversity”*. The proposal satisfies Principle No. 5.

## **Principle 6 Offsets should aim to result in a net improvement in biodiversity over time**

The area of vegetation to be set aside for biodiversity conservation purposes on the subject land exceeds the area of more degraded vegetation which is to be removed. Furthermore, the biodiversity conservation areas are in better condition generally than the areas of vegetation which require removal for the project.

Other relevant matters to take into account when considering the improvements in biodiversity which will result from the proposed management of the *Conservation Areas* on the subject land at Mundamia include:

- rehabilitation works which are to be undertaken within the *Conservation Areas* to remove existing weeds and to rehabilitate any areas previously affected;

- dedicated management of APZs to ensure the protection of threatened biota (such as the Nowra Heath-myrtle);
- the dedicated management of APZs for enhancement of the Nowra Heath-myrtle and its habitat;
- the removal of grazing and other agricultural activities which constitute a threat to remaining bushland on the subject land and in the Flat Rock Creek Reserve to the east;
- the removal of weeds (including noxious species) from degraded parts of the subject land; and
- the ultimate dedication of the *Conservation Area* to Council for biodiversity conservation purposes.

#### **Principle 7      Offsets must be enduring**

The dedication and management of the *Conservation Areas* on the subject land for biodiversity conservation purposes will be “*enduring*” insofar as those lands will be rehabilitated and dedicated to Council in perpetuity.

#### **Principle 8      Offsets should be agreed prior to the impact occurring**

The proposed offsets for the development at Mundamia, and the provision of a detailed *Vegetation Management Plan* (consistent with the in-principle VMP provided in this *Report* – Appendix H) will be conditions of the approval of the proposed Mundamia residential development by the Department of Planning & Infrastructure (DP&I), pursuant to Part 3A of the EP&A Act. The offsets will be subject to scrutiny pursuant to the Part 3A assessment process, and will form part of the conditions of the approval and the commitments associated with the approval.

#### **Principle 9      Offsets must be quantifiable**

The proposed offsets contained in this *Report* have been quantified in terms of area (9.49ha of land to be dedicated for biodiversity conservation purposes) and in terms of management measures to be applied to the *Conservation Areas* (Appendix H).

#### **Principle 10      Offsets must be targeted**

As discussed elsewhere in this *Report*, the majority of the lands which are being dedicated for biodiversity conservation purposes are in better condition than those which are being removed. The proposed development area was determined, both through the previous Council/DoP process and through this investigation, by identifying degraded vegetation and land suitable for development purposes.

In this regard, as documented elsewhere in this *Report*, the vegetation present within the development footprint is already in a significantly to moderately degraded or disturbed condition, and is of less conservation value than the vegetation to be retained in the *Conservation Areas*.

**Principle 11    Offsets must be located appropriately**

The *Conservation Areas* on the subject site are located in the northern and eastern parts of the land, adjacent to the existing Council Reserve containing Flat Rock Creek (to the immediate east). This circumstance results in an increase in the overall area of conserved land and vegetation at this location, and the maintenance of wildlife corridor values along Flat Rock Creek and its gorge.

**Principle 12    Offsets must be supplementary**

The proposed *Conservation Area* offsets on the subject land at Mundamia are not currently the subject of any funding, and have no security of either tenure or management activities. The proposed development of the subject land at Mundamia will provide both funding for the rehabilitation and management of the *Conservation Areas*, and will ensure that the protection by ultimate dedication to Council.

**Principle 13    Offsets and actions must be enforceable**

As noted above, the offset activities and actions associated with *Conservation Areas* on the subject site will be the subject of a *Vegetation Management Plan* (VMP), the implementation of which will be a condition of approval. In addition, management of the *Conservation Areas* is part of the *Statement of Commitments* for the project, and the land is ultimately to be dedicated to Council for conservation purposes in perpetuity.

## 14 DEC and DECC GUIDELINES

### 14.1 DEC Draft Survey Guidelines 2004

This *Flora & Fauna Issues & Assessment Report* for the proposed residential development at Mundamia has been prepared in accordance with the *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities – Working Draft* (DEC November 2004), insofar as they relevantly apply.

In addition to the substantial investigations which had been undertaken by BES on the subject land and in the vicinity (BES 2004a, b, 2007, 2009, 2010), field surveys undertaken for this project and *Report* have included an array of additional studies by Environmental InSites and SLR Ecology (see Chapter 2 for details), including:

- general ecological investigations on several occasions;
- supplementary targeted surveys, for threatened species, including the Nowra Heath-myrtle *Triplarina nowraensis*, Rosenberg's Goanna, the Spring Tiny Greenhood orchid and the Yellow-bellied Glider;
- surveys by Environmental InSites, SLR Ecology and the SCC for the Spring Tiny Greenhood orchid including *inter alia* on the subject land; and
- revised and refined vegetation mapping by SLR Ecology (contained in this *Report*).

Notwithstanding the substantial array of investigations which have been conducted on the subject land itself and on adjoining lands (by BES/ELA, Environmental InSites and Shoalhaven City Council), there are doubtless specific elements of the DEC *Draft Survey Guidelines* (dated 2004) which have not been satisfied 'to the letter'.

However, any such technical 'non-compliance' with those draft *Guidelines* is not considered by the authors of this *Report* to be of relevance or consequence with respect to the proposed development of the subject site Mundamia because:

- the overwhelming majority of the land proposed for development activities is highly modified, degraded and has long been used for agricultural activities;
- specific and dedicated investigations have been conducted with respect to the likely potential relevant biota since 2004 *inter alia* on the subject land;
- the accumulation of data from the various investigations by a number of ecologists (BES/ELA, Environmental InSites and Shoalhaven City Council) constitutes an appropriate and substantial information base upon which to make an analysis of the ecological values and constraints on the subject land, and the potential or likely impacts on development; and
- the proposal and this *Report* have incorporated consideration of the array of information on the OEH website and in published literature.

## 14.2 DEC Draft Assessment Guidelines 2005

The investigations of the subject land at Mundamia, including the incorporation of information from other sites in the vicinity, satisfactorily address the survey and assessment *Guidelines* for threatened biota prepared by the (then) Department of Environment & Conservation<sup>4</sup> (DEC 2004, 2005).

The Draft *Guidelines for Assessment of Impacts on Threatened Species Under Part 3A*, prepared by the then Department of Environment & Conservation (DEC) and the then Department of Primary Industries (DPI) in 2005, have been addressed below with respect to the assessment and evaluation of likely impacts of the proposed development.

As noted above, it should be noted that the *Guidelines* identified above are:

- *Draft Guidelines* (ie they have not been finalised despite a substantial period between their initial 'release and the current time');
- are "*guidelines*", not statutory requirements or standards; and
- provide 'guidance' to the assessment process, which needs to be interpreted and applied appropriately depending on the circumstances of each individual application.

## 14.3 Steps in the Assessment Process

According to the 'requirements' of the *Draft Guidelines* (DEC 2005) identify a number of "*steps in the assessment process*":

- Step 1 Preliminary Assessment, which "*is primarily a desktop assessment involving searches of relevant databases .. and literature reviews to identify a list of threatened species which could potentially occur In the area*" (Chapter 2);
- Step 2 Field Survey and Assessment. The conduct of surveys for threatened biota is discussed in the DEC *Draft Guidelines*, and has been addressed in this *Report* (Chapter 2; Appendix A);
- Step 3 Evaluation of Impacts (Chapters 6-17);
- Step 4 'Avoid, Mitigate and Then Offset', which involves "*the description and justification of measures to mitigate any adverse effects*" (Chapter 17); and
- Step 5 Key Thresholds.

Step 3 of the DEC *Draft Guidelines* (2005) indicates *inter alia* that the "*magnitude and extent of impacts*", and their significance is "*related to the conservation importance of the habitats, individuals and populations likely to be affected*" by the proposal.

The *Draft Guidelines* state that the "*impacts will be more significant*" if:

- "*areas of high conservation value are affected*"; or
- "*individual animals, and/or plants and/or sub populations that are likely to be affected by the proposal play an important role in the long-term viability of the species, population or ecological community*"; or

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<sup>4</sup> The DEC is now, relevantly, part of the Office of Environment & Heritage (OEH), which is part of the Department of Premier Cabinet.



- “habitat features that are likely to be affected by the proposal play an important role in maintaining the long-term viability of the species, population or ecological community”; or
- “the duration of impacts are long-term”; or
- “the impacts are permanent and irreversible”.

**Table 9** The DEC/DPI Draft Guidelines for Assessment of Threatened Species Under Part 3A

Relevant Items	Where and how addressed
Factors to consider when preparing a Development Application	<ul style="list-style-type: none"> <li>• Threatened species are addressed throughout the <i>Report</i>, especially Chapters 4 and 5, Figures 8 and 9, and Appendices B, E and F.</li> <li>• This <i>Report</i> constitutes the “<i>threatened species assessment report</i>” required by DEC/DPI.</li> </ul>
<b>Steps in the Assessment Process</b>	
Step 1 Preliminary Assessment	<ul style="list-style-type: none"> <li>• Chapters 2, 3, 4 and 5</li> <li>• Appendices A-F</li> </ul>
Step 2 Field Survey and Assessment	<ul style="list-style-type: none"> <li>• Surveys by BES (2004a, b, 2007, 2009, 2010), Environmental InSites (2008, 2010 and 2011)</li> <li>• Chapters 2, 4 and 5</li> <li>• Appendix A</li> <li>• Figures 5, 6 and 9</li> </ul>
Step 3 Evaluation of Impacts	<ul style="list-style-type: none"> <li>• Chapters 6-17</li> <li>• Figures 6-11</li> </ul>
Step 4 Avoid, Mitigate and Then Offset	<ul style="list-style-type: none"> <li>• Chapters 14 and 18</li> <li>• Re-design of northern portion to retain Nowra Heath-myrtle</li> </ul>
Step 5 Key Thresholds	<ul style="list-style-type: none"> <li>• Chapter 14</li> </ul>

## 14.4 DECC Assessment of Significance Guidelines 2007

### 14.4.1 Areas of High Conservation Value

The proposed development of the subject land at Mundamia has concentrated development activities primarily within those portions of the subject land which have been assessed in this *Report* as having lower conservation values by virtue of:

- the nature of the vegetation types present; and/or
- previous and existing disturbance; and/or
- the relevance of those areas of vegetation to threatened biota known or expected to occur in the general locality.

The approach which has been adopted generally retains areas of vegetation which have not been directly affected to a significant extent by previous agricultural land uses, located generally in the northern part of the subject land and along the eastern boundary. These areas contain the majority of the Nowra Heath-myrtle, as well as habitat and resources for threatened fauna species such as the Yellow-bellied Glider and the Glossy Black Cockatoo.

Given those considerations, the majority of the “*areas of high conservation value*” on the subject land have been retained in the proposed *E2 – Environmental Conservation Zone* within the northern part of the land and along the eastern boundary. The development activities on the land are appropriately located in areas of greater disturbance or modification and/or in areas of lower conservation value (eg areas of native vegetation which have been affected by adjacent agricultural activities).

Arguably, the only “*area of high conservation value*” on the subject land at Mundamia is that which supports the high densities of the Nowra Heath-myrtle. This species has a restricted distribution, unlike the other threatened species known or likely to occur on the land which are wide-ranging and highly mobile and/or are distributed much more widely through the immediate vicinity and general locality. Thus, the only “*area of high conservation value*” is in the northern part of the subject land, and the proposed development in this area has been re-designed to avoid impacts on the overwhelming majority of the Nowra Heath-myrtle population.

It is to be noted in considering the assessment of potential impacts on threatened biota that the conclusions of this *Report* by Environmental InSites reflect, in essence, the conclusions which have been reached by Shoalhaven City Council (SCC) and the then Department of Planning (DoP) with respect to the appropriate development of Mundamia for residential purposes. The *Nowra-Bomaderry Structure Plan* (which was adopted by the Council and endorsed by the DoP) recognises the appropriateness of residential development at this location (including on the subject land).

Given that circumstance, the proposed development of the subject land at Mundamia is clearly an appropriate response to the assessment of potential impacts upon the threatened biota, as had previously been considered by the SCC and the then DoP.

#### **14.4.2 Importance of Individual Biota**

As noted above, most of the important and significant habitats and resources for the relevant threatened biota are to be maintained within the *E2 – Environmental Conservation Area* in the northern and eastern sections of the subject land at Mundamia (Figure 7).

Furthermore, for those threatened species known or likely to occur on the subject land at Mundamia, there are substantial areas of suitable habitat and resources in the immediate vicinity and general locality, including extensive areas of potentially suitable habitat and resources within the Crown Land surrounding Flat Rock Creek and within Triplarina Nature Reserve and Shoalhaven State Forest to the south (Figure 1). The natural and modified habitat proposed to be removed from the subject land (*ie* approximately 9ha of native vegetation) comprises only a minute proportion of the total available habitat within an approximate 10km radius of the land in the form of National Parks Reserves and State Forests.

The most significant or “*important*” biota present on or likely to occur on the subject land at Mundamia, no doubt, are those species which have been identified as “*threatened*”, and are listed in the TSC Act and/or the EPBC Act. The proposed development of the subject land at Mundamia for residential