



February 3, 2014

The Planning Officer
NPWS South Coast Region
PO Box 707
Nowra NSW 2541

Dear Steve Moore

Re: Public Exhibition of the Draft Plan of Management for Bomaderry Creek Regional Park

The Shoalhaven Branch of the national conservation body Australian Conservation Foundation is responding to this public exhibition on behalf of its membership (17 branch members), the incorporated Bomaderry Creek Landcare/Bushcare Group (40 members) and the Friends of Bomaderry Creek (180 members). All three groups have a common interest in the protection and professional management of the Bomaderry Creek Bushland and share a 27 year history of working in cooperation towards this common interest. We have agreed on the following comments and feel it best in the interest of efficiency and effectiveness in the review of this planning process to submit a combined response.

It is our view that the management of Bomaderry Creek Regional Park (Park) cannot be effectively nor professionally undertaken without a full knowledge, account and integration of the whole Bomaderry Creek Bushland (Bushland) of which the Park consists of only one third. Thus our comments will emphasise this basic principle/reality. We hope it will be appreciated that the initiation and progress of our joint campaigns have been focussed on the protection and professional management of the total 250 ha Bushland not just on the 82 ha that was available for reservation in 2002.

The following comments will follow the format of the Draft Plan to facilitate the review process.

References cited in the comments below can be found in those listed in the draft plan or additional ones listed at the end of these comments.

Acknowledgements

The Park was reserved in December 2002 principally as a result of long-term lobbying of successive state governments mainly by the local community groups: Shoalhaven Conservation Society (now defunct); ACF (Shoalhaven); Friends of Bomaderry Creek; Bomaderry Creek Landcare; plus two individuals May Leatch and Terry Barratt.

These groups and individuals went far beyond this lobbying to prevent a destructive road project through the central part of the Bushland and housing development over much of the Bushland.

The strategy to prevent this destruction involved: lobbying and making detailed submissions to federal, state and local governments and agencies; gathering resource data about the Bushland; promoting to the local and broader community the values of this very special place; making a successful appeal to the NSW Land and Environment Court against the issuing of a licence to the Shoalhaven City Council by the NPWS to 'Take or Kill' threatened fauna species; preparing a Draft Plan of Management for the 250 ha Bushland; forming a Landcare Group to put many of the management prescriptions of the draft plan into effect including weed removal and bush regeneration, track and boardwalk construction and maintenance, picnic area improvements, an interpretation program involving guided walks, provision of a display board and production of a Bushland walks booklet and a walking track leaflet; preparation of a fire plan in conjunction with the Council and the then Dept of Land and Water Management; and undertaking studies and original



research into the Endangered Bomaderry Zieria and Brittle Midge Orchid and the Vulnerable Albatross Mallee (also Endangered Population). All three species are listed at the national and state level in the Australian Environmental Protection and Biodiversity Conservation (EPBC) Act and the NSW Threatened Species Conservation (TSC) Act.

A personal account of the early days of this campaign is provided by May Leatch (1997).

Given the significant role played by the community in the protection and improved management of the whole Bushland and the reservation of one third of it as the Bomaderry Creek Regional Park, it is suggested that this major contribution be recognised briefly within this Acknowledgement section and, in more detail, in a specific section titled 'History of Dedication' in the Introduction.

1. Introduction

The introduction should include a 'History of Dedication' as suggested above.

1.1. Location, Gazettal and Regional Setting

Biogeographic Region

The size of the Bushland is greater than 230 ha (estimated at 250 ha) when the full extent of the contiguous area of the Bushland is included (see Map 2 in Barratt 2006).

As the Bomaderry Creek Bushland is a well-known entity in its own right, wherever it is referred to in the Plan, all three words in its title should commence with a capital letter.

Surrounding Land Use

The Bushland also includes the Crown reserves of the old tip site and the 30m strip along both shores of the Bomaderry Creek estuary upstream of the Princes Highway bridge over the creek.

Other Authorities

The name change of the SRCMA to the South East Local Land Services should be noted.

1.2. Statement of Significance

Biological and catchment values

Dot point two - please note that *Hibbertia* sp. Nov. has now been named *Hibbertia stricta* subsp. *furcatula*.

Dot point four - the following threatened animal species have definitely been sighted in the Park and should be added to the species listed in this dot point: grey-headed flying fox, powerful owl and sooty owl.

Given that the Park contains a representative sample of almost all of the Bushland habitats it is logical to expect the remaining four of the thirteen threatened animal species recorded throughout the Bushland to also occur in the Park. The four Bushland species not yet recorded in the Park are: giant burrowing frog; eastern pygmy possum, greater broad-nosed bat and gang gang cockatoo.

As a minor point, the common name of the *Myotis macropus* is more descriptive of the species as 'large-footed fishing bat'.

Aboriginal Heritage Values

The high archaeological value and Aboriginal heritage significance of the Bushland is due to the fact that there are approximately 31 recorded sites there. Most of these sites were recorded in Kelleher Nightingale Consulting (2010). Limiting the listing of the sites to just the nine recorded in the Park does no justice to the reality of the Aboriginal cultural value of this urban bushland. Community appreciation and allocation of adequate management resources cannot be expected



to reflect these values if the Service undervalues the Bushland in this way. It needs to incorporate the whole Bushland in its descriptions and in its management prescriptions and this applies to all aspects of this plan not just the Aboriginal heritage values.

Figure 2

Bomaderry Creek Landcare/Bushcare has prepared a new walking track leaflet which shows the access to the reopened foot access from Lynburn Avenue, Bomaderry to the River Oak Crossing in the south east corner of the Bushland (a supply of these leaflets will be delivered to the Regional Office shortly). It is suggested that Figure 2 be modified to include this new addition to the walking track system. Feel free to use any of the details on the map and from the rest of the leaflet (a Microsoft Publisher document can be made available on disc if required).

Please note that the southern walking track crossing of the creek is River Oak Crossing. The species from which this crossing was named is the large River Oak (*Casuarina cunninghamiana*). The species was originally mistakenly thought to be the Black Sheoak (*Allocasuarina littoralis*). There are two locations in Figure 2 that need amending.

Also, please check out the walking tracks near the Palm Lookout. They don't appear to be correctly depicted on the figure.

2. Management Context

2. Management Purposes and Principles

The draft plan describes regional parks as "...large areas of regional open space and bushland that are assessed as having high conservation, landscape and recreation values". But this Park is not a large area. It is only 82 ha, ie, only one third of the size of the total Bushland, which unlike the Park can be truly described as a "... large area of regional open space and bushland...". The Service should work to create the Park that was envisaged by the Bomaderry Creek Bushland Working Group (BCBWG 2001) and state that intention in this draft plan. In the meantime the Service should set out in this plan to reflect that long-term intention. To do so may very well attract the management resources required to properly manage this significant natural and recreational resource.

3. Specific Management Directions

The picnic area has been redesigned, but the refurbishment work has stalled. Planning needs to be refocussed and the necessary resources allocated to finish the job. It was pleasing to see some sign of this process starting to get underway late last year.

The story of the marvellous outcome with the new steel bridge at Mossy Gully needs to be told. The community disquiet over the long delay in renewing this all-weather crossing has now been put to rest. The Service should let the community know about its contribution to achieving a facility for which we can all be proud, the difficulties it faced and how it overcame them.

The gravel extraction and storage (spoil dump) areas have not been rehabilitated. Fencing and ripping of part of the gravel extraction area, funded by a grant gained by the Shoalhaven City Council, has been carried out. The fenced area is experiencing natural regrowth (mainly with excellent Black Sheoak germination), but much more is needed before this process can be described as complete. The gravel storage area was originally a Council spoil dump site abandoned many years ago. Apart from ripping and seeding at the time of abandonment, which resulted in some limited wattle germination, the site is very weedy and needs a careful think about its future use. One third of the site is Council owned with the remainder within the Park. Both Council and NPWS need to get their heads together over this.

Reference to "...possible protection works for threatened species" leaves us with serious concerns. We have been advocating protection works and prescribed fire regimes to improve the survival chances of the Bomaderry Zieria, Albatross Mallee and Bauer's Midge Orchid for a very



long time and all we read here is "... possible protection works...". These measures are urgently needed and the Service should commit itself to undertaking them expeditiously and with no equivocation.

Protection works for some specific Aboriginal sites are also needed in the short term.

With both the threatened species and the Aboriginal sites, joint action between NPWS Council is essential.

3. Values

3.1. Geodiversity

Issues

Re the first dot point: it is not correct to describe a former sandstone quarry now converted into a picnic area as "...rehabilitated...". It would be better described as having been "redeveloped for passive recreational purposes in a pleasant bushland setting".

Re the second dot point: the former gravel stockpile site has not been rehabilitated. As previously stated some limited and largely ineffective seeding took place many years ago. It is largely a very weedy and unattractive area. The margins of this site need significant attention to eradicate the weeds and establish suitable native vegetation to prevent weed encroachment into the adjacent natural area. Selection of appropriate species may also assist with fire exclusion from the adjacent bushland. Protection of this part of the Bushland is particularly important given the proximity of many plants of the Bomaderry Zieria.

Any attempt at restoring the natural values of the major part of the site would not be justified and probably unattainable anyway. It would be much more suitable for a number of community development options such as a sports ground, community centre, men's shed, community garden, plant nursery etc. These uses would be best managed by Council. On the other hand, Section 5 of the Plan raises the consideration of a NPWS information outlet and regional office on this site. This would of course have to be managed by the Service. Either way, the joint ownership of this land needs to be resolved.

Management Response

3.1.3 This response should commit the Service to undertake replacement of weeds with vegetation (no sense in calling this rehabilitation) along the margins of the gravel stockpile site.

3.1.4 It would be good to see an attempt to increase the plant diversity in this former gravel extraction area as it has the potential to become suitable habitat for the Vulnerable Glossy-black Cockatoo and the Vulnerable Yellow-bellied Glider. The natural regrowth of the Black Sheoak should attract the cockatoo as a food source, establishment of Scribbly Gum should provide potential long-term nesting sites for these birds and establishment of Grey Gum should increase the feed tree stock for the Yellow-bellied Glider.

3.2. Native Plants and Animals

Vegetation communities

Please note: the Scribbly Gum/Red Bloodwood forest/woodland (third last paragraph, p9) also includes the national and state Endangered Bauer's Midge Orchid.

Rare or threatened plants

In the first paragraph change the name of the Endangered Guinea Flower to *Hibbertia stricta* subsp. *furcatula*. The references Barratt (1997, 1999, 2006, 2007 and 2009a), Stephenson (2010) should be acknowledged in this paragraph as they provide much more detailed and more accurate data on the national and state threatened species of Bomaderry Zieria, Albatross Mallee and Bauer's Midge Orchid than Mills (2012). Please note: the sentence on Bauer's Midge Orchid is



incorrect. The species is not found on shallow soils and not above the southern side of the gorge (see comments in the 4th paragraph below about this species).

In the second paragraph it would be more accurate to describe the Albatross Mallee Endangered Population as occurring as a fragmented series of patches around the margins of the Narang Picnic Area. See Barratt (2009a) for the detailed and accurate account of this population. It would also be more appropriate to reference Barratt (2009a) and NSW Scientific Committee (2010) as the data sources rather than DECC (2009a) and EcoLogical (2011) as both of these latter references derive almost all of their information from the former two.

In the third paragraph it would be very appropriate to reference Barratt (1997 and 1999) as well as DECC (2009a) as the latter derived all of its information from Barratt. Please note that although there is some evidence of layering by this species it is not a commonly observed phenomenon (Barratt 1997). The species more common means of vegetative spread is by suckering (Barratt 1999 & 2007)

A separate paragraph for Bauer's Midge Orchid, with more details about this species is necessary. Stephenson (2010) is the data source for this species, but a succinct status description would not be easy to extract for the Park or the Bushland. Please note: the Australian Minister for the Environment, Greg Hunt, advised Alan Stephenson of the listing of the species in the EPBC Act as Endangered on January 15, 2014. The species' Endangered status is provided on the EPBC web site but no further details have yet been posted. Alan Stephenson and Terry Barratt are the only ones familiar with all the plants found in the Bushland to date. The following brief statement is suggested for inclusion in the Plan:

Bauer's Midge Orchid occurs in relatively open spaces within the Scribbly Gum/Red Bloodwood woodland within the western half of the Bushland. The main populations are in the land recently granted to the Aboriginal community. Two plants were located near the northern boundary of the Park (near West Cambewarra Road) in March 2013. A small patch was located just inside the Park in the cleared edges of the powerline passing through the centre of the Bushland. This site was vandalised in 2012 and no re-emergence occurred in 2013. This species' habitat takes up the largest part of the Bushland and it is therefore considered that more plants will be discovered both in the Park and the Bushland generally as more surveys are conducted (Barratt pers. Com). The orchid requires reasonably good rainfall during January and February to ensure good numbers emerge some 6 weeks later. Since the species requires relatively open spaces to germinate in, it is probable that a reasonably frequent fire regime would be beneficial to its survival.

Animals

The Bushland mammal list (Barratt 2006: Appendix 3), which was last updated 6/11/13 shows 22 mammal species. Twenty have been recorded in the Park, with one other, the Eastern Pygmy Possum, having been recorded within 100m of the south west boundary of the Park. Since the Park includes extensive areas of this species habitat (Scribbly Gum/Red Bloodwood woodland) it would be reasonable to assume that it will also occur within the Park.

The latest bird list (8/04/12) shows 124 species in the Bushland, the reptile list (8/04/12) shows 20 species and the 8/04/12 amphibian list shows 11 species. It is not clear which are the extra species on the bird and reptile lists, but the extra amphibian is the whistling Tree Frog (*Litoria verreauxii*).

Please refer to our notes above under subsection **1.2 Statement of Significance**. Of the seven threatened species listed as occurring elsewhere in the Bushland, three have been definitely sighted in the Park, ie, Grey-headed Flying Fox, Powerful Owl and Sooty Owl.

Regarding the Grey-headed Flying Fox, a significant flying fox camp is located just to the south of the Park on a distinctive bend of the creek known locally as Alum Rock. It is an annually-used maternity camp that meets all three criteria identified as roost habitat critical to the survival of



this species (Roberts 2009). The species forages in the Park particularly on the Red Bloodwood when in flower. It also at times disperses north along Bomaderry Creek to search for food in the surrounding area beyond the Bushland (Barratt 2009b). Park neighbours have reported the Powerful Owl hunting the flying fox at night and immature flying fox skulls have been retrieved in the vicinity of the reported predation. The tenure of the flying fox camp is Council land, Crown land and private freehold.

It is surprising that this Plan has made no reference to this flying fox camp and the importance of the Bushland as a whole (including the Park) to the survival of the camp. NPWS officer Phil Craven has had a long interaction with Council and members of South Coast Wildlife Rescue over management issues associated with the camp and he is well aware of its importance. The Service should make special reference to this important flying fox camp and commit to bringing together for joint conservation action the relevant agencies, land owners and interested members of the community.

Threatened Species Priorities Action Statement

It is recommended that the first sentence of the second paragraph of the introductory section be replaced by the following: "High priority recovery actions for Bomaderry Zieria, Albatross Mallee and Bauer's Midge Orchid are critical".

It is disappointing to find no reference to Bauer's Midge Orchid throughout this PAS subsection.

Issues

In dot point one it is incorrect to say that significant plant species are threatened by "...too frequent fire...". In fact, the current concern is about 'too infrequent fire' (see comments below re 3.2.2 under Management Response and 4.2 Fire).

In dot point two it is important to be aware that the informal walking track shortcut has been closed for the past two months and has not been reopened throughout the summer holiday period. It needs to be noted in the Plan that the situation needs constant monitoring and action taken to prevent this damaging activity from re-occurring.

Management Response

3.2.1 Fauna surveys in the Park for the Eastern Pygmy Possum are also worth conducting.

3.2.2 This is a most disappointing Management Response. To make our point clear, we make the following comments:

The threatened species priority action statement (PAS) for the Bomaderry Zieria is not an adequate basis for determining appropriate management action. For a start there are two extant Priority Action Statements on the EOH web site, ie,

Current strategy:

<http://www.environment.nsw.gov.au/resources/threatenedspecies/PASconsultation/PAS1/PASZieriabaeuerlenii.pdf> and

Draft amended strategy:

<http://www.environment.nsw.gov.au/resources/threatenedspecies/PASconsultation/CP/CPZieriabaeuerlenii.pdf>

Both are somewhat different from one another: many of the action statements in the current strategy are still awaiting action and the draft amended strategy sets things out in a more brief fashion making it difficult to compare with the current strategy. What is the status of these two different PASs?

The management response does not adequately reflect Barratt (2007). It is almost 7 years since clear and precise recommendations were made by Barratt (2007) about some experimental burns



for the Bomaderry Zieria given the very high likelihood that fire at a more regular frequency than has been occurring is necessary for the species' survival at some sites. In addition, there is no acknowledgement in this draft plan about the clear evidence of the species' vulnerability to drought. It is clearly sensitive to extended dry conditions and, due to the absence of seed in the soil profile, when a plant dies there is no recruitment when wetter conditions return. It is suspected that the lack of awareness or appreciation of the fire and drought implications for this species is the lack of familiarity with Barratt (1997 and 1999), although Barratt (2007) does provide a clear account of the evidence presented in the 1997 and 1999 references.

The most surprising and disturbing circumstance is, however, the lack of reference to the National Recovery Plan for the Bomaderry Zieria (DECCW 2010). Preparation of the recovery plan was funded by the Australian Government on behalf of both national and NSW state governments. It was published in 2010 setting out a 5-year program of proposed recovery actions which are to be formally reviewed within five years of its adoption under the EPBC Act. It was adopted on April 5, 2011. The formal review is therefore due in just over two years. The recovery plan references the four primary resource documents for the species (Barratt 1997, 1999 & 2007 and Sharma 2001) only one of which is referenced in this draft plan. The recovery plan is a succinct and accurate account of the species and should therefore be called on as the most appropriate data source for this Plan. SPRAT Profile (2013) should also be referred to as it provides a little more detail on a few issues although reflecting closely DECCW (2010) and Barratt (2007).

One clarification regarding SPRAT and DECCW is, however, necessary here. Both make the observation that 33 of the 49 recorded sites for this species occur in the Bomaderry Creek Regional Park. This appears to be implying that the Park is the major site for this species. This is incorrect. Although it is understandable to fall into the error of basing this apparent assumption on the number of sites, according to Barratt (2007) there are 618 plants in the 16 sites in the Council owned land which is a little more than 49% of the total population. Furthermore, the Council land contains the healthiest sites, with one site alone represented by 410 plants (Site E8), ie, 32.7% of the total population. So, it is very clear that the Shoalhaven City Council enjoys a significant responsibility for assisting with ensuring the survival of this very threatened species.

3.2.3 It is now 5 years since the Endangered Population nomination for the Albatross Mallee was submitted (Barratt 2009a). And it is 3 years since the NSW Scientific Committee (2010) made its Final Determination to list this Endangered Population. As well as providing accurately surveyed locations of sites, details of decline in population size over a 10 year period and the population's isolation from all of the other populations south of the Shoalhaven River, this nomination provided detailed accounts of the human threats to this population and advice as to how these threats could be managed. Yet, the only management action taken to protect this species has been by the Bomaderry Creek Landcare/Bushcare Group. They funded, through an Australian Government grant, the erection of a gated barrier on a power line easement to stop vandal activities further damaging an Albatross Mallee site, constructed a rollover drain to direct runoff from the powerline access trail onto another mallee site, and finally gave up on asking the Service to do something about the informal walking track through the middle of another mallee site and carried out the task of blocking off the track themselves.

What the Service needs to commit itself to is seeking ways of restoring the original hydrological conditions experienced by this mallee species, the changes of which appear to have contributed to the population decline of 37.5% over a 10 year period during which drought conditions prevailed (Barratt 2009a). In addition, reference to Barratt (2009a) will reveal advice regarding the need for weed, rubbish and spoil removal from affected sites and the possible need for ecological burns given that all existing sites have experienced a long fire-free history (last fire 1968).

Bauer's Midge Orchid: Given the inaccurate and limited information about this species in the draft plan under the **Rare or threatened plants** heading, it is not surprising that there are no action statements here. There should be a specific management response for the orchid recognising the lack of surveys by both the Service and Council to determine the full extent of the species within the Bushland and the limited knowledge of the species' ecological needs. On this



latter point consideration should be given to some ecological burns in the species habitat to assess the role of fire in its life cycle. This species as well as many other cryptic ground orchids respond very well following fire events, even hot ones (Barratt & Stephenson pers. obs.). As the major site for this species in the Bushland is the land recently granted to the Aboriginal community, there is an urgent need for the Service to enter into negotiations with the Aboriginal community regarding any plans they may have for the land that may threaten the survival of the species. A joint management program to maximise its biodiversity values would be a good outcome, although acquisition of this land by the state government may be the best way to go.

These are all the things that the Service and Council should commit themselves to for these three very much threatened species and these commitments should be documented in the Plan. There has been so much community commitment to the management of the Bushland that it is about time the responsible agencies took up the challenge themselves.

With regard to protecting threatened fauna species, particularly the national and state Vulnerable Grey-headed Flying Fox and Giant Burrowing Frog and the state Vulnerable Yellow-bellied Glider, the best approach for the Service would be to proactively pursue the addition to the Bomaderry Creek Regional Park of all of the Council and private property and Crown land remaining in the Bushland. The only exception would be the old North Nowra tip site and the Narang Road spoil depot site.

3.3. Cultural Heritage

Post 1788 history

To our knowledge, the Bomaderry Creek weir is just inside the northern boundary of the Park. The contrary view expressed in the draft needs to be clarified and corrected if necessary.

Please note the correct spelling of Barratt in the second top line on p13.

Issues

With reference to dot point two, the access trail has been relocated from its original alignment (principally to reduce potential impact on a Bomaderry Zieria site), but unfortunately the new alignment has involved a small cutting which has disturbed what may be the edge of an open artefact scatter (Kelleher Nightingale Consulting 2010 and Barratt 2011).

Management Response

3.3.3 It is suggested that the metal walkway be extended through the shelter to raise foot passage above the archaeological deposit.

3.4. Recreation and Education

Walking

Please note the need to change replace 'Sheoak' with 'River Oak' in the second last paragraph on p14 and also in 3.4.4 on p17.

Community Involvement

It is strongly recommended that the Service pursue with Council the erection by RMS of better directional signage at the Princes Highway/Narang Road intersection. The Bomaderry Creek Landcare/Bushcare Group has been advocating this action for some years now. The inadequacy of the signage at this intersection is often commented on by visitors.

It is also strongly recommended that the Service improve the very poor signage at the Narang Road entrance to the Park.



Given the resolution of the North Nowra Link Road issue, it would seem to be a good time to liaise with Council over providing improved car parking facilities for joint use of all visitors to the Bushland. The Plan should commit the Service to this course of action.

During her short stay in the South Coast Region, Ranger Patricia Ross established a very good working relationship with the Landcare Group, taking part in our weed management and planting programs, carrying out mulching to improve the appearance of the picnic area and initiating a process of planning improvements to the picnic area. This process was to be guided by identification of overall themes for the picnic area including a state of the art sign-shelter, relocation to another spot in the picnic area of the old Aboriginal theme display shelter and installation of sandstone rock seating on the western side of the picnic area.

This is an excellent restart of the earlier improvements to the picnic area, but there is a need to provide interpretive signage for the Serpent Wall mosaic. Its significance escapes most visitors and possibly explains some vandalism it has suffered. Members of the local community group, Pride of Bomaderry, have been particularly critical of a lack of information about this outstanding feature. Past plans for an interpretive display associated with proposed plantings of the Bomaderry Zieria also need to be put into operation.

There was also an undertaking by Ranger Ross to pursue completion of a draft interpretation plan for the Park. We urge that this task be finalised and would be pleased to comment on it at an appropriate stage. We also urge the Service to involve Council in its development.

An all-weather northern crossing of the creek (3.4.3) is fully supported and early attention to this is urged. Not only will it improve Bushland visitor access, it will facilitate access for Bomaderry High School students from North Nowra as well as extend overall opportunities for bicycle use of the Bushland.

Although the Landcare/Bushcare Group is prepared to continue providing a walking track leaflet for the Bushland over the next 12 months (subject to some financial assistance), it is considered a responsibility of the Service and Council and we look forward to them taking this on by the time current stocks run out.

This improved liaison, working relationship and program of picnic area upgrading and other improvements need to be committed to in this Plan.

4. Threats

4.1. Pests

The targeted weed species list should include the Mother of Millions. As explained in the draft plan, this species was identified by Barratt (2008) as a particularly concerning plant. This was due to its widespread invasion of disturbed and undisturbed parts of the Bushland during the drought years from 2002 to 2007. Some of these invasions were in and adjacent to Bomaderry Zieria sites. Much of the infestations have been brought under control in a cooperative program between Council and the Landcare/Bushcare Group. Infestations within the Park adjacent to the Weir Lookout have not been brought fully under control and need early attention.

A minor change is suggested in the last sentence of the third last paragraph on p19. This sentence implies that residential development *will* occur west of Falcon Crescent (the area granted to the Aboriginal community last year). Just as the NPWS issued a licence to take or kill endangered fauna to facilitate the North Nowra Link Road in 1993 on the assumption that the whole Bushland was going to be subdivided (an outcome that failed to eventuate), to assume that the development of this smaller area of the Bushland will eventuate may also be an event that will not see the light of day. It is therefore suggested that 'once' on the last line of the paragraph be replaced with 'if'.



There needs to be a separate paragraph for rabbits. Barratt (1997) gives an account of browsing of suckering shoots of Bomaderry Zieria following fire. Nearby rabbit droppings led Barratt to reasonably suggest this species was responsible for the browsing. SPRAT Profile (2013) provides a useful wording to cover this activity: “Regrowth is likely to be browsed by rabbits, as indicated by scrapings and dung in the vicinity of plants. At such times, when other vegetation may be scarce or unpalatable, the fresh shoots of the Bomaderry Zieria are vulnerable to browsing. There are so few Bomaderry Zieria plants remaining that even minor levels of browsing may be significant, particularly for some of the genetically distinct sub-populations”.

It is suggested that this be followed by: “Rabbits are known to occur in and around the picnic area quite close to Bomaderry Zieria sites. Limited control work was undertaken some years ago in association with the Bomaderry Creek Landcare Group”.

One of the best bush regeneration outcomes of Bomaderry Creek Landcare has been the dramatic change to the environs of the Park entrance. At the formation of the Landcare Group in February 1994 there was no parking area or gate and both sides of the access road was a total infestation of weeds and rabbit activity. There is still much work to be done, but we always rejoice in the good feelings we experience when walking into the Park past the maturing forest margins of the access road. In our additional role as a Bushcare Group under the auspices of the Council, we operate in Council owned and managed land in the Bushland according to an Action Plan prepared by the Group. Last year Council requested an update of the Action Plan. We look forward to liaising with the Service and Council over achieving an expanded program that takes in the whole Bushland as a cooperative three-way task. It would be appreciated if the Plan of Management could include an acknowledgement of our work and commit the Service to join us in development and implementation of a three-way bush regeneration program.

Management Response

4.1.2 and 4.1.3 It is recommended that these two management responses be combined to express the thoughts outlined in the paragraph immediately above.

4.1.5 The rabbit population is on the increase in the picnic area, probably attracted to the grass there given the limited food supply elsewhere under the current very dry conditions. The Landcare Group has some funds available for control work but needs some professional assistance from the Service and Council. It is suggested that the following sentence be added to management response: “Rabbit control work in and around the Narang Picnic Area will be recommenced with funds held by the Bomaderry Creek Landcare Group”.

4.2. Fire

Fire History

This subsection reflects a limited understanding of the pre-Park dedication days and lacks a detailed analysis of where the pre and post Park fires have occurred. A detailed understanding of the fire history of the Bushland and its implications for biodiversity and threats to life and property is essential for a professional approach to fire management. The following is an attempt to bring all of those elements together based on a review of a bushfire management plan prepared by Terry Barratt (SCC & DLWC 1998), Barratt (2007, 2009a), some limited information in this draft plan and the personal experience of the Bushland by Terry Barratt over a 26 year period.

An account of how the 1998 bushfire management plan came about and what it achieved is available in a paper prepared for a NSW Nature Conservation Council conference on ecologically sustainable bushfire management (Barratt 2002). The following assessment brings that early fire history into context with the current situation and briefly analyses the implications for threatened plant species within the Bushland and for the communities on its boundaries.

The detailed fire history of the Bushland up to 1998 recorded in SCC & DLWC (1998) shows that the western and north western part of the Bushland was frequently hazard reduced up until 1996.



The generally same area was then subjected to an intensive series of wildfires over a short two and a half year period from 1996 to 1998 resulting in more than 60% of the Bushland being burnt out. A decision was made not to carry out any more hazard reduction for a 5-year period from 1998 to 2003. At the time it was considered that the frequency of the fire regime was too high and there was considerable uncertainty about the effect of frequent burning on rare and threatened plant species. Although it was clear that most of the known sites of rare and threatened plant species were in the less frequently burnt areas towards the eastern side of the Bushland, this moratorium on burning was considered a prudent measure until enough was known about the threatened species.

The only fires that have occurred since then have been quite limited in extent and mainly the result of arson. The one significant exception was a very hot fire in August 2001 which escaped from a property on West Cambewarra Road, burnt out about 40 ha and only brought under control west of the creek by a favourable change in the weather.

The Service has recommenced hazard reduction mainly in the Park over the last 3 years, but all of these burns have been towards the western edges of the Bushland. Information in this draft plan and observations of where fires have occurred since 2001 indicate that very little of the eastern third of the Bushland has experienced fire for many years. It is here that all of the Endangered Bomaderry Zieria sites and all of the existing Albatross Mallee Endangered Population sites occur. All of the known sites of Endangered Bauer's Midge Orchid occur in the western part of the Bushland. Comparison of the fire history with the recorded sites of these threatened species reveals the following:

Species	Number of Sites	Years Since Fires
Bomaderry Zieria	14	46
Bomaderry Zieria	8	31
Bomaderry Zieria	6	28
Bomaderry Zieria	5	18
Bomaderry Zieria	9	17
Bomaderry Zieria	2	15
Bomaderry Zieria	2	14
Bomaderry Zieria	1	10
Albatross Mallee	All	46
Bauer's Midge Orchid	All	17

The draft plan advises that "A variable fire frequency of between 7 and 30 years is generally appropriate for the most widespread forests and woodlands of the park". If this is true for the Zieria, mallee and orchid then the above table indicates all three species are in trouble.

Comments in the plan about Bomaderry Zieria under **Ecological requirements** are not correct except for the statement that it "...resprouts readily following fire but can be killed by hot fires". Despite advice in Barratt (1999 and 2007) that this species suckers readily after fire and drought and that its main form of regeneration is by suckering rather than layering there seems to be a reluctance to acknowledge this and other emerging evidence about this species, such as the need for a more focussed program on burning. This is not to say that it requires frequent fires, but since it has shown no tendency to produce seeds there is no need to be concerned about providing enough time between fires for the species to set seed. What is abundantly clear from all of the research and documentation about this species over a 20 year period is that in those sites where dense regrowth of other species restricts light and competes for other resources, Bomaderry



Zieria is at a disadvantage and is showing signs of disappearing at these sites. This also seems to be a similar situation with Bauer's Midge Orchid (Barratt & Stephenson pers. obs.). Although it is successfully competing with adjacent dense growth in the Bushland even after 46 years since the last fire the Albatross Mallee is, however, quite tolerant of the occasional hot fire (Mills 2002). Thus, it is appropriate to be concerned about the excessively long periods since fire for at least two of these three species.

The growing evidence of senescence in those communities free of fire for more than 17 years (particularly those fire-free for 46 years on the eastern side of the creek) is a matter of very great concern.

The Plan must revisit this situation and advocate an urgent commitment to undertaking experimental burns for at least two of these three species to help answer the questions raised in the above assessment.

Reference to the fire management strategy for the Park (NPWS 2006) under **Strategies and cooperative arrangements** raises a few points. This strategy appears to be a diagrammatic representation of the situation, but the details on the document accessed by the link on the References page are unreadable. The explanation of this strategy in the draft plan gives priority to the protection of urban areas north, south and west of the Park. It is not clear why priority is given to the northern side as that is normally the direction from which fires come. In addition, the setting here is generally rural except for the urban strip on the opposite side of West Cambewarra Road with houses well set back on large blocks. It is clear from an inspection of the maps in SCC & DLWC (1998) that the main threats would be to urban areas on the eastern and southern sides with lesser concerns on the western side except for the Byron Avenue and Halcot Avenue intrusions.

SPRAT Profile (2013) references a fire management plan (DECCW 2006b) but this cannot be located on the EOH web site. SPRAT states that the plan requires:

- No hazard reduction more often than every 7 years;
- No slashing more often than every 10 years; and
- No tree removal, use of foam or other fire retardants or earthmoving equipment on the Bomaderry Zieria habitat.

While there could be no disagreement with dot point three, it would be interesting to know if dot point one is referring to the Zieria and how the 7-year prescription was arrived at, and if there is any thought of slashing Zieria habitat as per dot point two.

From the above analysis of the Bushlands threatened plant species it would seem that the eastern side of the Bushland requires some attention to reducing the long fire-free periods prevailing here. Development of a fire experimental strategy to address this problem (which needs to consider the risk of weed infestations following these fires) would also probably improve the fire risk concerns for those living on the Bushland margins.

This revisiting of the fire strategy for the Bushland would dictate the need to reword subsection 4.2.5. A suitable wording could be:

“4.2.5 Urgently review the fire management strategy for the Park, taking into consideration the emerging evidence that there is a growing risk of threat to life and property and to the survival of threatened plant species arising from the growing senescence of plant communities throughout the eastern third of the Bomaderry Creek Bushland. This strategy is to focus attention on a fire experimental approach to address the decline of threatened species, while at the same time seeking to reduce the threat of fire escapes from the Park. This strategy will also aim to avoid the risk of weed infestations following this new fire regime.”

The fire strategy should also give attention to the needs of Bauer's Midge Orchid. A progressive hazard reduction program throughout this species habitat is recommended to achieve a shorter



fire history overall and introduce a varying pattern of burns similar to the conditions that prevailed during the 1980s and 1990s (refer Map 4 of SCC & DLWC 1998). It is suggested that, in the interests of life and property protection as well as habitat management, the blocks between West Cambewarra Road and the powerline easement (extending across the creek to the north eastern corner) be given early attention. This will require a cooperative effort between the Service and Council.

4.3 Isolation and Climate Change

Replace 'or' with 'and' on the second line in the first paragraph.

It is suggested that the last sentence of the second paragraph be modified as follows: "NPWS will liaise with land-use planning authorities *and the Aboriginal Land Council* with the aim of *avoiding the potential impacts by considering alternatives to residential development* or reducing the potential impacts as far as possible should these areas be developed in the future.

Climate change

The research undertaken into the genetics and pollination biology of the Bomaderry Zieria in 1998 and 1999 (Barratt 1999) ran into difficulties as a result of prevailing drought conditions that reduced flower production. Significant die-back of the species was also reported at the time (Barratt 1999). Barratt (2007) reported an 11% drop in the number of plants between 1997 and 2007 which he attributed to drought. Clearly the species is sensitive to drought although there appears to have been an additional small population drop since then as a result of disappearance of some sites, probably due to a lack of more regular fire (Barratt pers. obs.). Both DECCW (2010) and SPRAT Profile (2013) acknowledge the threat of drought for this species.

While the drought sensitivity of Albatross Mallee is not clear, modifications of the local hydrology within the habitat of the Endangered Population of this species appears to have been a factor in its 10% reduction in population size during the 10 year period between 1999 and 2009.

It is probable that the Key Threatening Process of climate change is operating to reduce the population numbers of Bomaderry Zieria and the Endangered Population of the Albatross Mallee. It is therefore suggested that the following sentence be inserted after the first sentence in the last paragraph of this subsection: "The two plant species most at risk of more regular and extended dry periods are the Endangered Bomaderry Zieria and the Endangered Population of the Albatross Mallee."

Management Response

Given the above comments it is suggested that the following additional responses be inserted in the Plan:

"4.3.4 Continue to closely monitor Bomaderry Zieria sites to assess the impact of drought on the species and consider/develop strategies to deal with these impacts."

"4.3.5 Undertake ground works to maximise surface and subsurface drainage to Albatross Mallee sites to moderate drought impacts on the species."

6. Implementation

Plan section and management response

Given all of the foregoing comments and recommendations the following changes are suggested:

3.1.3 Delete 'if required'.

3.1.4 Insert after 'the park' "...carry out plantings and seed sowing..."



- 3.2.2 Given that the informal track has been closed, modify wording to acknowledge the need to ensure that the closure is maintained. Insert 'and drought' after 'burning' in the last dash point.
- 3.2.3 Insert 'identified' after 'undertake' and delete 'if needed'. Give this action a High priority.
- 3.3.3 Insert 'walking track and' before 'floodwaters'.
- 3.4 Add a management response as follows: "Improve signage at the Princes Highway/Narang Road intersection, at the Narang Road entrance and improve interpretation services in the picnic area".
- 3.4.4 Replace 'Sheoak' with 'River Oak'.
- 4.1.5 Add the following sentence: "Rabbit control work in and around the Narang Picnic Area will be recommenced with funds held by the Bomaderry Creek Landcare Group"
- 4.2.5 Replace this management response with the following: "Urgently review the fire management strategy for the Park, taking into consideration the emerging evidence that there is a growing risk of threat to life and property and to the survival of threatened plant species arising from the growing senescence of plant communities throughout the eastern third of the Bomaderry Creek Bushland. This strategy is to focus attention on a fire experimental strategy to address the decline of threatened species, while at the same time seeking to reduce the threat of fire escapes from the Park. This strategy will also aim to avoid the risk of weed infestations following this new fire regime."

Add another management response to reflect the fire protection and Bauer's Midge Orchid aspects of fire management on the western side of the Bushland.

- 4.3 Add the following management responses:

"4.3.4 Continue to closely monitor Bomaderry *Zieria* sites to assess the impact of drought on the species and consider/develop strategies to deal with these impacts."

"4.3.5 Undertake ground works to maximise surface and subsurface drainage to Albatross Mallee sites to moderate drought impacts on the species."

7. References

Please add the following references:

Barratt, T. (1997): *An Investigation into the Distribution and Status of Zieria "baeuerlenii" the Bomaderry Zieria: A Case for Declaration of Critical Habitat*. A report prepared for the Australian Conservation Foundation (Shoalhaven Branch) by Terry Barratt BSc, July 1997.

Barratt, T. (1999): *The Bomaderry Zieria A Seedless Entity? An account of the conservation status and an investigation into the genetics and reproductive processes of the threatened species Zieria "baeuerlenii"* (ms), submitted in part fulfilment of a BSc (Hons), Dept Biological Sciences, University of Wollongong, May 1999.

Barratt, T. (2002): Community Initiated Fire Planning for the Bomaderry Creek Bushland, Terry Barratt BSc (Hons) Environmental Scientist. *Bushfires Managing the Risk 2002: Proceedings of a Conference on Ecologically Sustainable Bushfire Management*. Nature Conservation Council of NSW, Sydney, June 2002.

Barratt, T. (2006): *Bomaderry Creek Bushland Draft Plan of Management*. Prepared by Terry Barratt BSc (Hons) for the Australian Conservation Foundation (Shoalhaven Branch), September 2006 (6th Edition).

Barratt, T. (2009a): *Endangered Population Nomination for the Bomaderry Population of Eucalyptus langleyi - Nowra (Albatross) Mallee*. Prepared by Terry Barratt BSc (Hons) for the Australian Conservation Foundation (Shoalhaven Branch), January 13, 2009.



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Barratt, T. (2009b): *The Bomaderry Creek Habitat of the Grey-headed Flying Fox*. Report to the Flying-Fox Information & Conservation Network Conference, Nowra August 1-2, 2009.

Barratt, T. (2011): *North Nowra Link Road - Concept Plan Application No. 07_0037: Appendix G: Aboriginal Archaeological Assessment, Stage 2, July 2010*. Review by Terry Barratt BSc (Hons), March 2011.

DECCW (2010): *National Recovery Plan for Zieria baeuerlenii*, Department of Environment, Climate Change and Water (NSW), Hurstville.

Kelleher Nightingale Consulting (2010): *North Nowra Link Road: Aboriginal Archaeological Assessment - Stage 2*. Prepared for Shoalhaven City Council, Nowra, July 2010.

Leatch (1997): Bomaderry Creek Link Road: Urban Bushland Under Threat. *On the Brink, Their Habitat, Our Act - Is the Threatened Species Conservation Act working?* Proceedings of a conference held at the University of Sydney. Nature Conservation Council of NSW, May 1997.

NSW Scientific Committee (2010): Listing of a population of *Eucalyptus langleyi* north of the Shoalhaven River as an Endangered Population in Part 2 of Schedule 1 of the Threatened Species Conservation Act, gazetted 17/12/10. <http://www.environment.nsw.gov.au/determinations/eucalyptuslangleyiF.htm>

Roberts, B.J. (2009): Submission to Department of the Environment, Water, Heritage and the Arts regarding concerns over impact of the North Nowra Link Road on the Vulnerable Grey-headed Flying Fox.

Sharma, I.K. (2001): Understanding clonal diversity patterns through allozyme polymorphisms in an endangered and geographically restricted Australian shrub, *Zieria baeuerlenii* and its implications for conservation. *Biochem Syst Ecol.* 29:681-695.

SPRAT Profile (2013): *Zieria baeuerlenii*, Species Profile Threats Database, Dept of the Environment, Australian Government (last updated 16 July 2013): http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=56781

Stephenson, A.W. (2010): Threatened species nomination for addition of *Genoplesium baueri* to the list of threatened species under the EP&BC Act.

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Attached is a brief biography of Terry Barratt



BIOGRAPHY

TERRY BARRATT BSc (Hons)

Terry has worked 25 years as a manager and planner with the NSW National Parks and Wildlife Service and 10 years as an environmental scientist with Sydney Water.

Following migration from England at the age of six, he lived in Sydney for 31 years and has since then lived, for the past 34 years, in the Shoalhaven district on the NSW coast. During this latter period he was the NP&WS Manager responsible for the then Nowra District for 10 years and the Sydney Water Illawarra Region's Environmental Scientist for a further 10 years. He has been in semi-retirement since late 1999.

Throughout his professional career he has been an environmental activist in his own time and has carried this activism on full-time during his retirement years.

Terry's professional and private interests have included land and water management, research and resource analysis, environmental assessment, policy development, community consultation, environmental advocacy on behalf of community groups, political activism and a strong commitment to the Landcare movement.

His knowledge of the south coast between Wollongong and Batemans Bay and the adjacent southern tablelands is extensive – a region which takes in the total catchment area of the Shoalhaven River.

This detailed regional background and broad range of experiences provide him with a particular perspective on the natural resource and water management issues associated with a significant part of the south coast of NSW, the Shoalhaven River and its catchments, plus issues associated with wastewater recycling (in both urban and rural settings).

Terry is currently Chair of the Australian Conservation Foundation (Shoalhaven Branch), Chair of the Bomaderry Creek Landcare Group, Chair of the Shoalhaven River Alliance, spokesperson for the Friends of Bomaderry Creek and committee member of the Shoalhaven Landcare Association and Gerroa Environmental Protection Society.
