



Independent Ecological Review of North Beach Byron Development Proposal

June 2006

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**Report for
NSW Department of
Planning**

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Development Proposal**

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- Matt Beitzel (Biosis Research)

ABBREVIATIONS

ANW	Atlas of NSW Wildlife
APZ	Asset Protection Zone
CMA	Catchment Management Authority
DCP	Development Control Plan
DEC	Department of Environment and Conservation
DEH	Department of the Environment and Heritage
DGR	Director General Requirements
DMP	Dune Management Plan
DNR	Department of Natural Resources
DPI	Department of Primary Industries
EEC	Endangered Ecological Community
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EP&A Act	<i>Environmental Planning and Assessment Act 1978</i>
FM Act	<i>Fisheries Management Act 1994</i>
LEP	Local Environmental Plan
LES	Local Environmental Study
LGA	Local Government Authority
NPWS	National Parks and Wildlife Service
RFI Act	<i>River and Foreshores Improvement Act 1948</i>
SEE	Statement of Environmental Effects
SEPP	State Environmental Planning Policy
SIS	Species Impact Statement
TSC Act	<i>Threatened Species Conservation Act 1995</i>
Sp.	Species
VMP	Vegetation Management Plan

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1.0 INTRODUCTION

Biosis Research Pty. Ltd. was engaged by NSW Department of Planning (DP) to undertake an independent ecological assessment (terrestrial and aquatic) of DA 10-2-2006 for a staged development proposal at North Beach, Byron by Becton Pty Ltd which incorporates a 117 key integrated tourist facility; environmental repair and creation of a habitat conservation area. This review includes assessment of the:

- Statement of Environmental Effects (S. J. Connelly Pty Ltd)
- Flora and Fauna Report (Parker 2004)
- North Beach Byron Species Impact Statement (Parker 2006a, b, c)
- Relevant submissions from government agencies and local interest groups

1.1 Project Background

The proposed development (North Beach Byron) is located just to the north of Byron Bay township, within the ground of an existing tourist resort and golf course. The proposed development includes redevelopment of the tourist facilities including creation of a village centre and construction of new residential/tourist accommodation. As part of the development, the golf course will be removed and considerable rehabilitation/revegetation will be undertaken as part of the environmental repair of the site and creation of a habitat conservation area. In addition stormwater and drainage across the site will be managed to reduce potential impacts of water quality changes, sediments and pollutants on nearby wetlands and waterways.

1.2 Scope of Works

The aims of this study are detailed in the project brief in Appendix 1 and include:

- consideration of the Development Application in relation to its potential impact on flora and fauna in general and specifically on threatened species and endangered ecological communities. This is to include a review of the Flora and Fauna Report (2004) and Species Impact Statement (comprising Volumes 1, 2 and 3) prepared by Peter Parker Environmental Consultants Pty Ltd and the Statement of Environmental Effects as it relates to ecology;
- consideration of submissions received in response to the exhibition of the development application with respect to biodiversity/ecological issues;

- consultation with relevant officers of the Department's planning teams; and
- meetings with Departmental officers and the Applicant, as required.

1.3 Subject Site

North Beach Bryon development area is located 4.7 km north of Byron Bay and covers approximately 90 ha, consisting of:

- Lots 2-35 and 44, Section 7 DP 1623
- Lots 16-23, Section 6 DP 1623
- Lots 1, 2, 6-13, DP 243218
- Lots 447, 449 and 450, DP 812102
- Lot 1, DP 780243
- Lot 2, DP 620642
- Lot 1, DP 190757
- Lot 100, DP 849102

Within the proposed development area, land is zoned 2(t)-(Tourist Area Zone), 7(a)-(Wetlands Zone), 7(b)-(Coastal Habitat Zone), 7(f1)-(Coastal Land Zone) and 7(f2)-(Urban Coastal Land Zone). Tyagarah Nature Reserve and a State Environmental Planning Policy (SEPP) 14 Wetland (which drains across the site into Belongil Estuary) border the site to the north. Belongil Estuary forms part of the southern boundary of the site, where another SEPP 14 wetland is located within the boundaries of the proposed development site.

1.4 Legislation and Terminology

Statutory regulations affecting species, populations and ecological communities that are relevant to the proposed development are listed below and will be considered further in this report.

Commonwealth:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act):
 - Assessment of the impact of the proposed development on matters of national environmental significance (MNES) using ‘significance impact criteria’ and determination of the need for a referral to the Commonwealth Minister for the Environment
 - Assessment of the potential for key threatening processes (KTPs) to impact MNES

State:

- *Environmental Planning and Assessment Act 1979* (EP&A Act), *Threatened Species Conservation Act 1995* (TSC Act) and *Fisheries Management Act 1994* (FM Act):
 - Assessment of the impact of the proposed development on matters of threatened species, populations and ecological communities using ‘assessments of significance’ (i.e. seven part test) and determination of the need for a species impact statement (SIS)
 - Assessment of the potential for key threatening processes (KTPs) to impact threatened species, populations and ecological communities
- *River and Foreshores Improvement Act 1948* (RFI Act):
 - Consideration of whether the proposal is consistent with State Government policy including NSW State Rivers and Estuaries Policy and the need for a Part 3A permit
- *Noxious Weed Act 1993*
 - Identification of the presence of noxious and notifiable weeds
- State Environmental Planning Policy (SEPP) 14 – Coastal Wetlands
 - Assessment of impacts on coastal wetlands

- SEPP 26 – Littoral Rainforest
 - Assessment of impacts on littoral rainforest
- SEPP 44 – Koala Habitat
 - Assessment of the presence of ‘potential’ and ‘core’ Koala habitat

Local

Byron Shire Council has a number of strategies, policies and reports that are relevant to the proposed development including:

- Biodiversity Conservation Strategy (Byron Shire Council 2004a)
- Coastline Management Strategy (WBM Oceanics Australia 2003)
- State of the Environment (Byron Shire Council 2004b)
- Byron Flora and Fauna Survey (Landmark Ecological Services *et al.* 1999)
- Byron Shire Development Control Plan (DCP) 18

Licences and Permits

In addition, the need for the following licences and permits will be considered

- Part 3A permit under RFI Act
- Permit under Section 201, 205 or 219 of FM Act
- National Parks and Wildlife Act 1974
- Animal Research Act 1985
- Environmental Planning and Assessment Act 1979.

In order to provide consistency with relevant legislation and guidelines, the following terminology will be used to describe the proposed development and its surrounding environment:

Subject Site: the area directly affected by the development (i.e. development footprint)

Study Area: Area impacted directly or indirectly by the proposed development (as defined in Department of Environment and Conservation’s *Assessment of Significance* Guidelines). This area includes the Subject Site, Survey Area and

usually, the Project Area. It is however, not limited to the Project Area. The Study Area is used to assess the impact of development on local populations of threatened species/populations and local occurrences of endangered ecological communities (EECs), as both are defined at that which occurs in the Study Area. For the purpose of this review, the study area is defined as the subject site, dune and beach areas in the vicinity of the subject site (up to 1 km from beach access points), the SEPP 14 wetland and Tyagarah Nature Reserve to the north of the subject site, and Belongil Estuary. This is based on the potential for the development to change drainage patterns across the site, potential for changes in water quality and increased anthropogenic use of the site.

2.0 METHODS

2.1 Documents Reviewed

A list of documents used to prepare this report is in the References section. Information from the various databases and other sources was collated.

2.2 Site Visit

A site visit was undertaken by Dr Eleni Taylor-Wood and Dr Rhidian Harrington on Friday 26 May 2006. Peter Parker (proponent's ecological consultant) provided further details of the development and showed Dr Eleni Taylor-Wood and Dr Rhidian Harrington around the subject site. Before and after which, Dr Eleni Taylor-Wood and Dr Rhidian Harrington looked at areas outside the subject site (beach, Belongil Estuary and the SEPP 14 wetland to the north of the subject site) but considered to be part of the study area.

The purpose of the site visit was to get an overview of the proposed development and no surveys were undertaken during the site visit.

2.3 Limitations

This study was limited to a brief site visit and review of documentation provided. As such, no full assessment of potential threatened species, populations and communities and impacts upon them was undertaken. Information and opinions provided in this report are based on the information provided in the SEE, Flora and Fauna report and SIS (plus associated reports) and the experience and knowledge of the reviewers.

3.0 CRITICAL REVIEW OF STATEMENT OF ENVIRONMENTAL EFFECTS

Overall little detail is provided within the SEE about the ecological values and threatened species and populations associated with the subject site. While there is cross reference to the flora and fauna reports prepared by Parker (2004, 2006a, 2006b, 2006c) in some sections of the SEE. Given that the purposes of an SEE is to consider and identify environmental impacts and provide information on steps that will be taken to protect the environment, it is important to identify what the environmental values are that may be impacted and required protection.

Assessment of the impacts of the proposed development and mitigation measures have been combined with the description of the proposed development and are not always clearly distinguished in the SEE.

3.1 Suitability of Data and Information Used in the Assessment

3.1.1 Description of Subject Sites Ecological Values

The introduction of the Statement of Environmental Effects (SEE) notes that the SEE *‘must be read in conjunction with the plan set and technical appendix volumes accompanying the Development Application’*, which includes Reference 22 Flora and Fauna Report (Parker 2004) and the Species Impact Statement (Parker 2006a, b, c). While the ecological values of the site are identified in these and other reports, Byron Flora and Fauna Report (Landmark Ecological Services *et al.* 1999), State of the Environment (Byron Shire Council 2004b) and Biodiversity Conservation Strategy (Byron Shire Council 2004a), there is no description of these values within the body of the SEE. Such values could be presented as a summary of the findings from the above reports within Section 1 Introduction or Section 2 The Site of the SEE, with cross reference to these reports. Without inclusion of this summary, the reader of the SEE is unaware of the overall high conservation value of the site.

Within Section 2.3 Natural Characteristics there is a brief mention of the five main vegetation types located within the subject site (eight communities referred to in Parker 2004), but there is no mention that some of these vegetation types are listed as endangered ecological communities on the TSC Act or that a number of threatened species listed on the TSC and/or EPBC Acts have been recorded within, or in the near vicinity of, the subject site. In addition a SEPP 14 wetland is located within the subject site, with a further SEPP 14 wetland located to the north of the site.

While the ecological values of the subject site have not been summarised within Section 2.3 Natural Characteristics, the facilities associated with the current tourist development are described within this section which seems inappropriate given the section heading.

3.1.2 Composite Map of Constraints and Opportunities

Section 2.7 Site Analysis Summary provides a series of maps that summarise the sites constraints and opportunities including those associated with water bodies, creeks, SEPP 14 wetlands, vegetation and wildlife corridors. These maps are provided with little or no explanation, especially given the lack of description of ecological values of the site.

3.1.3 Description of the Proposal

Considerable detail is provided within Section 3 the SEE of the proposed development and potential future stages, including development of a village centre, residential accommodation and associated infrastructure and amenities. Within this section, a number of objectives in relation to conservation and habitat protection (pg 31, SEE) are provided.

3.2 Assessment of Impacts and Mitigation Measures of the Proposal

3.2.1 Freshwater Wetlands

Within Section 3, there is a brief description of a number of environmental management measures that are proposed to be implemented as part of the proposed development (pg 60), including filling of the existing man-made drain running north to south through the subject site. While it is acknowledged that this drain currently drains wetlands in the adjoining Tyagarah Nature Reserve, no mention is made that these wetlands are also part of a SEPP 14 Wetland. In addition, the SEE states that reprofiling the drain ‘will restore the natural hydrology in the wetlands’. However, a review of Reference 7 Flooding and Drainage (Maunsell 2005), Reference 15 Geotechnical (Golder 2004) and Reference 16 Stormwater Management (GeoLINK 2004), shows no indication of any assessment of potential impacts on these upstream wetlands from changes in their drainage pattern.

Anecdotal information indicates that this drainage line has been in place for approximately 100 years (P. Parker *pers. comm.*) and most likely replaced a natural drainage line from the wetlands to Belongil Estuary. Given the time that the drainage line has been in place, the wetlands will have adapted to their current hydrological regime. Changing this regime may have a positive or negative impact on the wetlands and this should be assessed before any changes

are made, especially given the wetlands are part of a SEPP 14 wetland within a nature reserve. In addition there appears to be no assessment of the potential impacts of changes in flow regime within the subject site on freshwater wetlands due to capture of rainfall runoff in rainwater tanks and redirection of stormwater runoff. Any potential impacts are most likely to occur during dry periods. Changes in water quality have been considered.

3.2.2 Landscape and Revegetation Objectives

A number of objectives for landscaping and revegetation of the subject site are outlined on pg 63 of the SEE. While there are references to the TSC Act, SEPP 44 and Byron Shire DCP in determining these objectives, there is no mention of the objectives of the RFI Act, Byron Biodiversity Conservation Strategy (Byron Shire Council 2004a), Byron Coastline Management Strategy (WBM Oceanics Australia 2003) or Byron Shire State of the Environment Report (Byron Shire Council 2004b).

Generally the species suggested for use in landscaping appear to be species local to the Byron Bay area, which is appropriate. However, the species list provided for use within the General Revegetation and Dunal/Coastal Woodland areas seem to be dominated by rainforest species, with some woodland species also included. A more diverse selection of local native woodland and sand dune species should be used for planting in areas where these communities would have naturally occurred prior to disturbance. The aim of the planting program appears to be to conserve and enhance the existing native vegetation of the study area. In order to achieve this, the species selection and planting design should reflect the natural landscape as it would have been prior to disturbance.

Only species that naturally occur in adjacent vegetation communities should be planted within buffer areas and any revegetation areas. Species of local native provenance, propagated from seed collected from within a 5 km radius of the study area should be used in all landscaping within the study area.

On pg 73 of the SEE, a number of species have been identified for planting of 5 m buffers around each waterbody/freshwater wetland within the subject site. Many of the species identified are wetland species and require water or moist soil conditions for growth. Given the buffers are terrestrially based, many of the species identified are unlikely to be suitable for the buffer.

3.2.3 Landscaping Plans

The composite map of the site constraints and opportunities as provided in the SEE indicates that considerable areas of the subject site will be revegetation/rehabilitated as part of the proposed development (Figure 1). This is further emphasised in the section on 'Landscape and Revegetation Objectives'

(pg 63, SEE) where lists of species to be planted by vegetation type are provided. However examination of the Landscape Plans suggests that limited plantings are actually planned to be undertaken (Figure 2), with large areas of the proposed revegetation areas appearing to remain largely unplanted. Further, a more recent Landscape Plan (Plan 2) indicates that even further areas will remain unplanted (Figure 3), with plantings to actually be concentrated around the proposed residences rather than in the proposed ‘revegetation areas’ (see Figure 4 for Biosis Research’s understanding of where the outer edge of the proposed development/asset protection zone overlayed on Plan 2). The proponent needs to state definitively which areas will be replanted including species types, abundance and density of plantings. This needs to be provided for all areas, but especially the proposed revegetation areas, asset protection zones and buffer areas.

3.3 Compliance with Relevant Statutory Requirements

3.3.1 Threatened Species Legislation

Under Section 4 Statutory Planning Matters – 79C(1)(a) of the SEE, reference is made to sections of the EP&A Act relevant to threatened species and the TSC and FM Acts. In addition, the *Native Vegetation Conservation Act 1997* (now repealed by the *Native Vegetation Act 2003*) is mentioned. However, no mention of the Commonwealth EPBC Act is made under this section. A number of the species recorded within, or within the vicinity of, the subject site are listed EPBC Act and should be considered under this section.

Given the detail provided in other subsections of Section 4, on how the proposed development meets its statutory requirements, further discussion should be provided within this section regarding the statutory requirements and assessment under the TSC, FM and EPBC Acts.

Similarly, under ‘Potential adverse impacts on significant flora and fauna and their habitats’ (pg 194) no mention is made of species protected under the EPBC Act.

3.3.2 RFI Act

Under ‘Integrated Development’ (pg 83), the SEE discusses the need for a Part 3A Permit under the RFI Act. Under this section the SEE states that a ‘permit is required for the making of an excavation on, in or under protected land, or removing material from protected land. This is not proposed by this application’. This statement is then immediately contradicted by ‘the proposed development will involve very minor excavation and the removal of material

within 40 m of the two main drainage line’. Thus confirming the need for a Part 3A Permit, as acknowledged in the SEE.

3.3.3 SEPP 14 Wetlands

The SEE states that the proposed development does not involve clearing, construction on, draining or filling of any SEPP 14 wetland (pg 88), however, filling of the man-made drain that runs north to south through the subject site could change the drainage of a SEPP 14 wetland. There appears to have been no assessment of impacts to the SEPP 14 wetland resulting from filling of the drain.

Similarly under Clause 36 – Development adjoining wetland (pg 135) the SEE states that ‘the proposed development is not likely to result in significant adverse impacts’ to ‘the adjacent SEPP 14 wetland’. Without an understanding of potential changes to the hydrology regime (caused by filling of the man-made drain) of the SEPP 14 wetland to the north of the site it is difficult to fully assess the potential impacts of the proposed development.

While the proposed development will create 100 m buffers around the SEPP 14 wetlands and provide on site management of stormwater runoff to minimise any potential impacts, changes to the hydrological regime of the wetlands caused by the development should be assessed.

3.3.4 Dunal Areas

The SEE states that the proposed development seeks to reduce functional beach access points to one, with the current eastern access points to be used for emergency access only (pg 191). The proposed access point is located on a steep dune system that will be susceptible to erosion unless managed correctly.

3.4 Additional Information or Assessments the Applicant Should be Required to Provide

- Assessment of the hydrological impacts on waterbodies and wetlands resulting from changes to drainage regime within the subject site. In particular, hydrological impacts to SEPP 14 wetlands resulting from filling of the drain that runs north south through the site
- Assessment of impacts associated with increase numbers of people in relation to rubbish, noise, disturbance to species and/or their habitats, impacts on waterways and impacts on dunal areas.

4.0 CRITICAL REVIEW OF FLORA AND FAUNA REPORT

Report is difficult to follow, has poor structure and lacks sufficient detail regarding potential impacts. This combined with the need to cross reference to other reports makes report difficult to read and assess.

4.1 Adequacy of Methodology

4.1.1 General

In the glossary section, the study area is defined as the subject site (proposed development area) and additional areas which are likely to be directly or indirectly affected by the proposal (as defined in guidelines for application of the TSC Act. However, there is no further definition of the study area in the report to indicate the actual area considered. Clarification of the actual study area is important as it is relevant to assessing the extent of impact on threatened species through application of the eight part test.

To undertake surveys in accordance with relevant legislation, licences are required to collect, trap and handle threatened species under the TSC and FM Act and a permit is also required for animal ethics from NSW Department of Primary Industries (DPI Agriculture). While Peter Parker and Eli Dutton held a licence from NSW Department of Environment and Conservation (DEC) for threatened species under the TSC Act and a permit from DPI (Agriculture), they do not appear to have obtained a licence to undertake surveys under the FM Act. While the techniques used during the fish surveys are commonly used fishing methods (i.e. bait traps, dip net), as the surveys were conducted for the purpose of an environmental assessment a licence should have been obtained prior to conducting the surveys.

Within the section 'Biological Characteristics of the Site' (pg 4.10.4) a description is provided of the existing development, the development history of the site and current impacts (including those that will be mitigated by the current proposal), but there is no discussion of the proposed development or its potential future stages. While this information has been provided in considerable detail within the SEE, it was expected that at least a brief description of the proposed development would be provided within the flora and fauna report, especially given that there is description of the existing development and impacts. Without a description of the proposed development, it is difficult for the reader to assess the potential impacts of the development.

4.1.2 Threatened Species

In DEC's draft survey and assessment guidelines (DEC 2004) the recommended process for determining potential threatened species that may occur within the study area includes:

- Search of relevant databases for records within a 5-10 km radius of the study area;
- Review of relevant literature;
- Consultation with relevant experts; and,
- Knowledge of vegetation communities/habitats within the subject site.

This process can be used to determine threatened species, populations and communities listed on the TSC, FM and/or EPBC Acts that are known, or likely, to occur within the study area.

In the flora and fauna report, there appears to be no clear process under which potential threatened species were determined. On pages 4.10.7-8, referenced is made to a number of previous surveys that have been undertaken in the area and Table 4.10.2 (pg 4.10.20-21) appears to summarise threatened fauna species known from the study area based on these studies, the current surveys and personal observations by Peter Parker. However there is no mention of or description of Table 4.10.2 in the body of the text until the Discussion (pg 4.10.58), nor is there any mention of how these species were determined and under which acts they are listed. The assessment of potential for threatened flora and aquatic species and endangered ecological communities also appears to be limited.

4.1.3 Flora

4.1.3.1 Survey Methods

Flora survey methodology used in Parker (2004) involved meandering transects and meandering search patterns through the study area. No quadrat surveys were undertaken. DEC (2004) recommends a combination of both transects and plot based surveys (quadrats) to ensure an area is adequately surveyed. Transects are valuable for obtaining an understanding of the vegetation communities in the area, identifying community boundaries and recording species, while quadrat sampling ensures the collection of detailed quantitative data of plant species distribution and abundance (DEC 2004).

4.1.3.2 Survey Effort

The vegetation survey involved a ‘meandering search pattern, which involved traversing the study area and visiting all of the vegetation associations identified in the vegetation map’ (Parker 2004). It is stated that the search pattern was considered sufficient to detect the majority of cryptic plant species, however, a map showing the location of the random meander transects and vegetation plots undertaken was not provided in the report. Furthermore, survey effort and seasonality of surveys was not detailed in the report. It is therefore difficult to assess the adequacy of the search pattern and effort in detecting cryptic, seasonal and/or threatened species.

4.1.4 Fauna

The suggestion in the Flora and Fauna Survey report (Parker 2004) that the fauna methodology was designed to meet the DG’s requirements is misleading as all the fauna surveys were completed before the DG’s requirements were published. Statements like “In accordance with the DG’s requirements...” mislead the reader. Additionally, the Methods section paraphrases the DG’s requirements in many locations, which doesn’t reassure the reader that the survey used the methodology as stated, particularly as the surveys were completed before the DG’s requirements were issued.

Although it appears that the methodology employed to sample fauna was adequate and generally met the DG’s requirements, it is impossible to be certain as the methods section is so poorly set out. The details for each survey method used are not summarised in one location, but spread over a number of locations, including a figure legend. The survey methods and effort need to be summarised in one table which includes information on the following for each survey method:

- Survey technique (e.g. spotlight, call playback, random meander, etc);
- Targeted subject species;
- The time invested in each survey technique e.g. - number of person hours per transect, duration of call playback, number of nights traps set. **Effort must be expressed for each separate survey technique and each separate habitat type;**
- Date of surveys;
- Survey location AMG to nearest 100m;
- Description of site location;

- Survey point or transect marked on a map with a clear legend;
- Size, orientation and dimensions of quadrat or length of transect for each survey technique;
- Survey start times and finish times; and,
- Name of surveyors and/or persons undertaking identification.

4.1.4.1 Frogs

Although methodology and survey effort for frogs appears to be appropriate, as the exact dates on which the surveys were conducted have not been stated it is impossible to verify that the weather conditions were appropriate.

4.1.4.2 Reptiles

It is not possible to fully ascertain whether survey methodology for reptiles was appropriate, although survey effort appeared sufficient. As the exact dates on which the surveys were conducted have not been stated it is impossible to verify that the weather conditions were appropriate.

There is no indication that marine turtles were surveyed.

4.1.4.3 Birds

The methodology and survey effort for birds is considered to be sufficient for this type of assessment, although winter surveys (except for nocturnal species), habitat mapping for wetland species and surveys for *Allocasuarina* (Glossy Black-cockatoo food source) have not been conducted.

4.1.4.4 Spotlighting (mammals and birds)

The spotlighting methodology and survey effort for birds and mammals is considered to be sufficient for this type of assessment.

There is no indication that surveys for nocturnal reptiles were performed.

4.1.4.5 Call playback (mammals and birds)

The call playback methodology and survey effort for birds and mammals is considered to be sufficient for this type of assessment, although the Marbled Frogmouth and Barking Owl do not appear to have been targeted.

4.1.4.6 Hairtubes

The hairtube trapping methodology and survey effort was generally appropriate, although none of the traps appear to have been baited with meat or fish. The name of the person who analysed the hair samples is not stated.

4.1.4.7 Mammal Trapping

The mammal trapping methodology and survey effort was generally appropriate, although not enough details are provided to be certain. It appears as though tree trapping using Elliot traps (size B) was not conducted.

4.1.4.8 Scats, tracks, diggings and other signs survey

The scats, tracks, diggings and other signs survey effort was generally appropriate, although not enough details are provided to be certain.

4.1.4.9 Pitfall trapping

The pitfall methodology and survey effort for small mammals and reptiles is considered to be sufficient for this type of assessment.

4.1.4.10 Common Blossom Bat Survey

The mist netting methodology and survey effort for the Common Blossom Bat is considered to be sufficient for this type of assessment.

4.1.4.11 Grey-headed Flying-fox and Black Flying-fox

The methodology and survey effort used to detect megachiropteran bat species is considered to be sufficient for this type of assessment. However, no indication is given as to whether a desktop-based study was performed to determine where the nearest flying-fox camp is located.

4.1.4.12 Ultrasonic call recording – microchiropteran bats

The ultrasonic call recording (Anabat) methodology and survey effort for microchiropteran bats is considered to be sufficient for this type of assessment. Bat calls were analysed by Peter Parker, but it is not known whether he is qualified for this task.

4.1.4.13 Harp trapping – microchiropteran bats

The harp trapping methodology and survey effort for microchiropteran bats is considered to be sufficient for this type of assessment.

4.1.4.14 Roosting sites – microchiropteran bats

The roosting sites survey methodology and survey effort for microchiropteran bats was generally appropriate, although not enough details are provided to be certain.

4.1.4.15 Koala

The survey methodology and survey effort for koalas appears to have been sufficient for this type of assessment, although not enough details are provided to be certain. Although not required for this type of assessment, the koala survey methodology does not meet the DGRs – this study does not contain an information review, habitat assessment, specific surveys or detailed reporting specific to the Koala.

4.1.4.16 Marine mammals

No surveys for or consideration of marine mammals appears to have been made. Considering the proximity of the development to the ocean (a marine park) this is an omission that should be rectified.

4.1.4.17 Invertebrates

Insufficient details are provided to determine whether targeted surveys for threatened invertebrates were sufficient. Mitchell's Rainforest Snail surveys were conducted by Peter Parker who, from the information provided in his curriculum vitae, is not considered to have demonstrated experience in land snail survey and identification (as requested in the DG's requirements).

4.1.5 Aquatic Ecology

4.1.5.1 Threatened and Protected Species

There appears to have been no assessment of potential threatened aquatic species that may occur within the study area. Such an assessment would normally include a search of DPI (Fisheries) and Australian Museum databases (accessed online via BioNet) and the EPBC online database, consultation with relevant experts and a review of relevant literature.

A review of DPI (Fisheries) and Australian Museum databases and consultation with relevant experts at DPI (Fisheries) indicates that the following threatened aquatic species should have been considered as part of the flora and fauna report (i.e. previously recorded within 5 km of the study area and/or potential habitat known to occur:

- Black Cod, *Epinephelus daemeli* (FM Act)

- Green Sawfish, *Pristis zijsron* (FM Act)
- Oxleyan Pygmy Perch, *Nannoperca oxleyana* (FM Act, EPBC Act)

Byron Shire State of the Environment (Byron Shire Council 2004b) report also states that the Eastern Freshwater Cod, *Maccullochella ikei* (FM Act), also occurs in Byron Shire.

In addition, a search of the EPBC online database indicates a further 31 marine fish, six marine reptiles and 14 marine mammals that should be considered under the EPBC Act. Another three species are listed as protected under the FM Act.

4.1.5.2 Aquatic Surveys

The aquatic surveys that were undertaken for the flora and fauna report were inadequate as they only involved limited surveys for fish species using limited methods (2 bait traps/waterbody and/or spotlighting/dip netting). The bait traps were baited with bread and left for approximately two hours in each location (total of six locations – one drain and five waterbodies). The use of low trap numbers, no replicates, bread as bait and being set for only two hours, limited the potential success of the fish surveys. Leaving the traps for two hours is only sufficient if a number of traps (minimum of eight per site) are used. In addition, as mentioned earlier, there is no indication that a licence was obtained from DPI Fisheries prior to these surveys being undertaken.

Ideally the surveys should have involved:

- Habitat assessment of each waterbody (recommend modified AusRivas assessment) to assess the condition of the waterway and current impacts. This is important to assess the potential for threatened species to be present;
- Fish sampling using a range of methods including:
 - 5-8 bait traps/site (if only left for two hours, then a minimum of eight traps), with a minimum of two sites per waterbody/drain. Each bait trap should be baited with tuna oil, pellets and sardines. If they are left overnight then glowsticks should be placed in each bait trap;
 - Seine netting;
 - Dip netting;
 - Electrofishing is also recommended but not essential;

- Fyke and/or gill nets would be required to trap larger species (e.g. estuarine species); and,
- In situ measurements of water quality at all survey sites.

4.2 Suitability of Surveys

4.2.1 Flora

4.2.1.1 Targeted and Seasonal Surveys

Initial surveys were undertaken in Spring (September-October 2002). Specific dates and survey effort for additional flora surveys was not specified in the report.

Threatened species that have potential habitat in the area and were targeted during the flora surveys were not specified. Some plant species known to occur in the local area require seasonal surveys to ensure best chance of detection due to their cryptic nature, such as *Geodorum densiflorum* (summer flowering, dormant in winter) and *Pterostylis nigricans* (autumn flowering, dormant when not in flower). It is unclear whether adequate seasonal surveys were undertaken for cryptic plant species that occur in the local area, with only the years that surveys were undertaken specified. No specific survey dates, time spent searching or map showing the surveyed area was provided for flora surveys.

4.2.2 Aquatic Ecology

As mentioned previously, the fish surveys undertaken as part of the flora and fauna report are considered inadequate for the purposes of assesses the potential impacts of the proposed development on threatened aquatic species and/or their habitats. Aquatic habitats within the study area include freshwater and brackish wetlands/waterbodies within the subject site, estuarine areas associated with Belongil Estuary and the beach and marine waters adjoining the subject site. For each of these areas, a habitat based assessment should have been undertaken as a minimum. Insufficient survey effort (effort per site and number of sites) was used for the fish surveys (as outlined above in Section 4.1.5.2) and no areas outside of the subject site were considered.

In addition, there appears to be no assessment of the potential for habitat of threatened aquatic species to occur within the study area.

4.3 Suitability of Data and Information Used in the Assessment

4.3.1 Flora

4.3.1.1 Vegetation Community Descriptions

Descriptions of vegetation communities are brief and do not include discussion of dominant species, structure, dominance of weed species, condition of the vegetation and disturbances present. Furthermore, there are no plates showing the different vegetation communities in the study area. This makes it difficult to envisage the different vegetation communities in the study area and their condition at the time of survey. Knowing the condition of the vegetation communities in the study area helps to design mitigation and management measures to reduce ongoing impacts and prevent further disturbances.

The lack of detailed floristic and structural information makes it difficult to determine whether the vegetation communities meet the definitions of Endangered Ecological Communities. This is of particular concern as it appears that Freshwater Wetlands on coastal floodplains and Subtropical Coastal floodplain Forest, which are EECs listed on the TSC Act, may be present in the study area, but the information provided is inadequate and prevents independent assessments to be made.

The vegetation map (Figure 4.10.4) does not identify the area identified as ‘Saltmarsh Complex’, which is equivalent to Coastal Saltmarsh, an Endangered Ecological Community under the TSC Act.

4.3.1.2 Database Searches

Local records of threatened species from the DEC Atlas of NSW Wildlife Database searches were not provided in the report. It is therefore not clear which threatened species have been recorded in the local area and therefore which should be targeted during the flora surveys. Furthermore, potential habitat for threatened species that may occur in the study area was not identified in the report.

4.3.1.3 Threatened and Significant Species

Two threatened species were recorded in the study area *Cryptocarya foetida* and *Syzygium moorei*, however count or population estimates of these threatened plant species in the study area was not provided. Furthermore, condition of the plants was not recorded (fruiting or flowering). This information should be used when assessing the impact of the proposal.

There is no reference to regionally significant flora species in the report.

In addition, under the section Plants of Conservation Significance (pg 4.10.39) there is no mention that all mangrove species are protected under the FM Act, and should any require removal a permit under the FM Act would be required.

4.3.2 Fauna

The Results section is generally poorly set out, making it difficult for the reader to determine easily which threatened animal species have potential habitat and which threatened animal species are likely to occur on site. Although threatened species detected during the surveys are listed it is not entirely clear which species have previously been detected on site. A table containing the threatened animal species with potential habitat within the study area, a description of that species habitat and the likelihood of the species occurring on site should be provided (including whether it has been previously recorded and by who).

4.3.2.1 Database Searches

As with threatened plant species, local records of threatened animal species from the DEC Atlas of NSW Wildlife Database searches were not provided in the report. It is therefore not clear which threatened species have been recorded in the local area and therefore which should be targeted during the fauna surveys. Furthermore, potential habitat for threatened animal species that may occur in the study area was not identified in the report.

4.3.2.2 Threatened and Significant Species

Although Table 4.10.2 and Appendix 2 provide a list of threatened animal species previously recorded from the study area, they don't differentiate between species listed on the TSC Act and EPBC Act or between Vulnerable, Endangered or Migratory species. Additionally, only 62 threatened species are considered in Table 4.10.2 when the DEC NSW Threatened Species website lists 83 threatened species listed on the TSC Act for the Murwillumbah CMA (http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/cma_subregion_list.aspx?id=15&type=animal), which is the catchment that includes the study area and surrounds. The assessment also needs to consider all threatened (30) and Migratory species (25) listed on the EPBC Act for the Byron LGA (see DEH's EPBC Protected Matters Search Tool - http://www.deh.gov.au/cgi-bin/erin/ert/epbc/epbc_report.pl?loc_lga=Byron;output=html;search=Report;search=Search;loc_type=lga;report=epbc;proc=process;loc_state=NSW). The output of this search is provided in Appendix 5 and yet all the species listed (including plants) have not been considered. It is recognised that some of the threatened and/or Migratory species listed on these search tools won't have potential habitat within the study area and can be discounted. However, a process of identifying threatened species (or their habitat) that are known from or surrounding the study

area and justifying the reasons for assessing or discounting those species needs to take place.

Frogs

The statement in paragraph two on page 4.10.41 that because the Wallum Sedge-frog was not detected in the 2004 surveys, even although it was detected in the 2002-2003 surveys, that it cannot be considered as present on site until further surveys are completed is false. As the species has been recently detected on site and there is potential habitat on site, all assessments should assume that the species is present.

Mammals

Paragraph two of page 4.10.58 states that 18 threatened animal species were recorded on site. This statement should be clarified so that it is obvious that the Common Blossom Bat, Greater Broad-nosed Bat and Large (Eastern) Bent-wing Bat have also been previously recorded on site by the Australian Museum, particularly as these species were included in Table 4.10.22 on page 4.10.54.

Threatened species habitat and wildlife corridors

Not enough details regarding the reforestation, regeneration of wetlands or rehabilitation of wetlands is provided to determine whether these meet the various state departments requirements. Additionally, the lack of information provided makes it impossible to determine whether these actions will effectively buffer wetlands or increase connectivity within the DEC-recognised wildlife corridor. Wildlife corridors are not mentioned or discussed, even though they are an important component of the sites ecological values.

4.3.3 Aquatic Ecology

The assessment of aquatic ecology values of the study area appears to be primarily based on the fish surveys undertaken as part of the flora and fauna report. There is little reference to other studies other than a previous study by Peter Parker in 1996 in which fish species in Belongil Estuary were surveyed over a four month period (see Table 4.10.23, pg 4.10.56, Parker 2004). Given that other, including more recent, studies have been undertaken within and in the vicinity of the study area, such studies should have been review as part of the aquatic ecology assessment. Such studies include:

- Schniener (1998), *Report of the aquatic organisms of Belongil Creek and swamp drains*. In Environmental Impact Statement – West Byron Wastewater Treatment Works. Volume 2: Supplementary Reports, (pp Planning and Policy Consultants, Byron Bay); and.

- WBM (2000a), *Tallow and Belongil Creeks Ecological Studies – Final Report*, WBM, Brisbane.

In addition searches of relevant databases should have been undertaken for threatened or protected aquatic species that may occur. The results of the database surveys could then have been used to design the survey methodology and provided information on the habitat types that could have been targeted during the surveys.

As no aquatic habitat assessments were conducted as part of the aquatic surveys, there is no understanding of the types and condition of aquatic habitats present or the classification of the water according to DPI (Fisheries) Fish Habitat Scheme (Fairfull and Witheridge 2003). Such information is important as it assists with assessing the potential for threatened species to occur as well as providing guidance for works undertaken near waterbodies and drainage lines. DPI (Fisheries) has provided guidelines for the mitigation of impacts associated with the construction of roads, bridges, culverts and other works which require the crossing/redirection of waterways (Fairfull and Witheridge 2003). Permits are also required for:

- Any form of dredging
- Any clearing of seagrass, mangrove or saltmarsh vegetation.

The fish species recorded during the aquatic surveys are commonly occurring species that one might expect to capture/observe using the methods described under 'Fish' on pg 4.10.11. It is expected that a number of other species would have been recorded if greater survey effort and range of techniques had been used (as described in Section 4.1.5.2). Surveys undertaken by Parker (Parker 1996) were more intensive and used a range of techniques, thus a greater diversity of fish species were recorded (Table 4.10.23, Parker 2004)

4.4 Reliability of Predicted Impacts of the Proposal

A general discussion of the predicted direct and indirect impacts is not provided in the report. The impact assessment is restricted to assessment under the *Environmental Planning & Assessment Act 1979*, *Fisheries Management Act 1994* and the *Environment Protection and Biodiversity Conservation Act 1999*. Therefore it is difficult for the reader to independently assess the likely impacts of the proposed development.

4.4.1 Flora

The report was written in 2004 and has not been updated to consider recent listings of threatened species and ecological communities on the TSC Act. Most

obviously is the listing of Swamp Sclerophyll Forest, Swamp Oak Floodplain Forest, Freshwater Wetlands and Subtropical Coastal Floodplain Forest. Eight Part Tests or Assessments of Significance under the TSC Act have not been undertaken for these EECs.

Parker (2004) concluded that the proposed development would not have a significant impact on threatened species, populations, ecological communities and/or their habitats. The major concern with this conclusion is that it relies on predictions that the native vegetation will be suitably buffered from the proposed development. However, as discussed in Section 5.6 below, it is arguable that the dual function of the buffer areas as Asset Protection Zones (APZ) and bushland buffers would not provide adequate protection from indirect impacts to the vegetation communities.

It is therefore considered that the reliability of the predicted impacts is questionable, with indirect impacts such as edge effects possibly having a greater impact on the native vegetation in the study area than predicted in Parker (2004).

4.4.2 Fauna

It is recognised that the impacts of the proposal on some threatened animal species may be minimal, however insufficient details have been provided about the development and its likely impacts (positive or negative) for the reader to make their own assessment. The proposed development must be described in detail and figures and maps provided to highlight areas that will be impacted and areas where revegetation is planned. The report suggests that large areas of the site would be revegetated with endemic species, and yet a landscape plan provided by Peter Parker (see Figure 3) shows that large areas would not be revegetated, but instead a park-like landscape would be created. The exact mitigation measures to be implemented must be described. It is highly misleading to suggest that areas will be rehabilitated to form endemic vegetation communities which would provide additional habitat for wildlife, when in fact the parkland-like environment of the golf course would be retained which provides no additional habitat for wildlife, if this is the case.

Throughout the report it is assumed that the impacts will not extend beyond the development footprint. Although this may be true during the construction phase (acid sulphate soils may result in impacts outside the development footprint though), it will not be once the dwellings are occupied. The development will result in an increased number of people holidaying on the site who will increase impacts to adjacent forested, beach and ocean areas through direct disturbance and also indirectly through activities such as firewood collection, rubbish dumping and the creation of walking trails.

The Eight Part Tests discuss impacts to hollow-dwelling fauna, but nowhere in the report is there a clear discussion of the number of hollow-bearing trees likely to be removed. If hollow dwelling trees are to be removed, then these should be replaced with nest boxes of comparable size in adjacent habitat at a ratio of at least 1:1.

4.4.3 Aquatic Ecology

It is difficult to assess the predicted impacts of the proposed development on aquatic ecology values of the study area as there is no description of the proposal in the flora and fauna report. In addition, while there is considerable description of the proposed development in the SEE, there is little reference to the ecological values of the study area in the SEE, especially in terms of aquatic ecology. Thus there little to no cross references/linkages between the SEE and the flora and fauna report with which the reader is able determine and assess the potential impacts on aquatic ecology values.

In addition, there appears to have been no assessment of the potential impact of changing the current flow regime across the subject site on wetlands and waterbodies within the study area. Given the importance of the wetlands and the potential for threatened species to occur within the waterbodies, it is important to fully understand any changes in hydrology and the impact that such change may have.

While there has been some assessment of potential impacts associated with water quality (as part of the stormwater report and pg 61 of the SEE, S. J. Connelly Pty Ltd 2006), this is insufficient for the purposes of assessing potential impacts on aquatic ecology values as it does not provide a comparison between natural, the existing development and the proposed development. Instead it provides a comparison between a 'green field' site (not sure if this means a naturally vegetated site or one that has been cleared but not previously developed) and the proposed development, with no consideration of the current development. In addition the parameters that have been provided does not include those of concern from an aquatic ecology point of view i.e. dissolved oxygen, electrical conductivity, turbidity, pH, temperature. Some limited information has been provided regarding nutrient levels based on stormwater modelling of the site, but this is summarised for the subject site as a whole and has not been provided in a consistent manner such that comparisons between pre and post development can be made (i.e. generation and discharge combined in pre development scenario compared to post development).

Given the limitation described above, the reliability of any assessment of predicted impacts on aquatic ecology values of the study area (including wetlands, waterbodies and threatened aquatic species) must be questioned.

- Limited discussion of impacts on aquatic and wetland environment
- Limited discussion on impacts on waterbodies
- Concentrated on impacts that affect terrestrial ecology, no full assessment of impacts on aquatic ecology

4.5 Significance of Likely Impacts of the Proposal in Terms of State and Commonwealth Legislation

Within the report Eight Part Tests have not been conducted for individual species, but instead combined for all species, including plants. This makes it very difficult to assess impacts to individual species and ecological communities and is not considered to be acceptable. The Eight Part Tests should be redone with full answers for each question for each species or ecological community. It is considered acceptable to assess groups of species with similar habitat requirements together, such as hollow-dwelling bat species.

While considerable information is provided in the report about the requirements/triggers (and exemptions) for an assessment under the EPBC Act, no formal assessment in accordance with the EPBC Act Administrative Guidelines of Significance has been conducted for any threatened or migratory species listed under the EPBC Act. Instead, the only assessment consists of the statement that ‘on a review of the above’ (being the requirements/triggers for assessment under the EPBC Act) ‘the North Beach Byron proposal does not significantly affect World Heritage properties (Part 3 Divn. 1 EPBC Act), wetlands of international importance, listed threatened or endangered species, any endangered community, any listed migratory species, any Commonwealth land and any bilateral agreement between the State and Commonwealth. Thus the proposal does not need referral to the Commonwealth.’

In addition, it has not been made clear in the report which species/ecological communities are listed on the TSC, FM and/or EPBC Act.

4.5.1 Flora

4.5.1.1 SEPP 26

There is no reference to State Environmental Planning Policy 26 Littoral Rainforest despite littoral rainforest being recorded in the study area.

4.5.1.2 *Threatened Species Conservation Act 1995*

Potential habitat for threatened plant species that are likely to occur in the local area and impacts on preliminarily listed ecological communities was not

considered in TSC Act Impact Assessment (Eight Part Test), as required under the legislation.

The Eight Part Tests are inadequate. A number of questions in the Eight Part Tests have not been answered for every threatened flora species and EEC. In particular:

- Part a) has no discussion of potential habitat for threatened flora.
- Part c) has no discussion of the regional distribution of habitat for the threatened flora (known to occur and having potential habitat), EECs or preliminary EECs. There is also no discussion of indirect impacts.
- Part d) and Part f) contain no discussion for threatened flora (known to occur or having potential habitat), EECs or preliminary EECs.
- Part g) contains no discussion for EECs or preliminary EECs.

The Eight Part Tests should be undertaken separately for each threatened species, population and ecological community (with the exception of species that occur in similar habitat types and use similar resources) to ensure that the entire assessment is undertaken for each species. Lumping everything under one Eight Part Test Assessment, as done in Parker (2004), does not allow each issue to be given adequate consideration for each threatened species, population and ecological community.

4.5.1.3 Environment Protection and Biodiversity Conservation Act 1999

Impact assessments following the EPBC Act Administrative Guidelines of Significance have not been undertaken for threatened plant species known to occur or potentially occurring in the study area. *Syzygium moorei* and *Cryptocarya foetida* are both listed as Vulnerable on the EPBC Act, yet the impact of the proposed development on these species have not been assessed under the EPBC Act. Furthermore, a number of threatened species listed on the EPBC Act with potential habitat in the study area have not been assessed under the EPBC Act.

4.5.2 Fauna

4.5.2.1 Threatened Species Conservation Act 1995

A number of questions in the Eight Part Tests have not been answered adequately for every threatened animal species. In particular:

- Part a) does not specifically discuss *whether a local viable population of the species is likely to be placed at risk of extinction.*

- Part b) states that no endangered populations occur within the vicinity of the site. However, Part 2 of Schedule 1 of the TSC Act lists the “Emu population in the NSW North Coast Bioregion and Port Stephens LGA” as an Endangered Population. As the site occurs within the North Coast Bioregion this population needs to be considered and addressed in all the relevant Eight Part Test questions.
- Part c) has no discussion of the regional distribution of habitat for the threatened animal species (known to occur and/or having potential habitat).
- Part d) does not answer the question “whether an area of habitat is likely to become isolated from currently interconnecting or proximate areas of habitat for threatened species, population or ecological community”. Need to discuss impacts to connectivity (positive or negative) of habitat for each species individually.
- Part f) does not specifically answer the question “whether a threatened species...or their habitats are adequately represented in conservation reserves in the region” for all species. Although areas and reserves where each species is known to occur are listed, there is no assessment about whether the species is adequately represented in conservation reserves.
- Part g) states that no Key Threatening Processes are likely to occur because of the development. This is not supported. The Environmental Management section of the report states that a drain will be filled in causing an “Alteration to the natural flow regimes of rivers, streams, floodplains & wetlands”, which is listed as a Key Threatening Process on the TSC Act. Additionally, the proposal may result in an increase in “Entanglement in, or ingestion of anthropogenic debris in marine and estuarine environments”, which is also a Key Threatening Process. The impacts of these threatening processes need to be discussed further in relation to each species they might affect.
- Part h) states that no threatened species are at the limit of their known distribution. This is false. The following threatened species recorded from the site are considered to be at the limit of their known distribution: Bush Hen, Ground Parrot, Black Flying-fox, Northern Long-eared Bat, Green and Golden Bell Frog and Hoary Wattled Bat.

Wallum Froglet and Wallum Sedge-frog (page 4.10.64)

Insufficient details are provided about drainage from the proposed development to determine whether or how either of these species would be impacted by the proposed development. Additionally, the earthen drain running out of the SEPP

14 wetland to the north along the western side of the main road through the study area will be filled in, but the impacts of this were not discussed. Additionally, the Australian Museum determined that the Wallum Froglet would be significantly impacted in a previous assessment of a similar development of the same site. The assessments of the Wallum Froglet need to explain why the current development will no longer have a significant impact on this species when compared with the previous development.

Threatened wading or beach nesting species (page 4.10.67-69)

The assessments do not acknowledge that the proposed development will increase impacts to these species through increased human use of the beach. Although it appears that information for residents and signs regarding the birds' breeding area at Belongil Estuary will be provided, the author assumes that this will remove all human impacts on these species, an assumption which is not supported. These impacts need to be acknowledged and discussed.

Species that are likely to have greater impacts from the development through increased human disturbance include the Lesser Sand Plover, Pied Oyster-catcher, Little Tern, Beach Thick-knee, Bush Thick-knee, Broad-billed Sandpiper, Black Bittern, Common Noddy, Great Knot, Greater Sand Plover, Sanderling and Terek Sandpiper.

Marine turtles

The Eight Part Tests for marine turtles assumes that because the development is buffered from the marine park that there will be no impacts to these species. The proposed development will increase impacts to the marine park and species that inhabit it (particularly those that utilise the beach or estuary at any stage of their life history) through increased human disturbance. The assessments for these species must discuss the impacts from increased human disturbance, providing details of the changes in numbers of people expected and the methods to be implemented to minimise those impacts.

The paragraph in Part a) of the Eight Part Tests on the Loggerhead Turtle (page 4.10.85) provides no details on local records of the species, which is misleading. A number of recent records (within 10 years) for this species exist within 5 km of the development (DEC Atlas of NSW Wildlife) and yet these have not been mentioned. The assessments for these species are considered to be inadequate.

4.5.2.2 Environment Protection and Biodiversity Conservation Act 1999

Impact assessments following the EPBC Act Administrative Guidelines of Significance have not been undertaken for threatened and migratory species known to occur or with potential habitat within the study area. These assessments

need to be completed or full justification for why species haven't been assessed must be given.

4.5.3 Aquatic Ecology

4.5.3.1 SEPP 14

No assessment under SEPP 14 has been conducted. Filling of the man-made drainage line that runs north to south through the subject site may alter the hydrological regime of the SEPP 14 wetland to the north of the subject site. There appears to have been no assessment of the potential impacts of changing the hydrological regimes or assessment under SEPP 14 in either the flora and fauna report (Parker 2004) or the SEE (S. J. Connelly Pty Ltd 2006).

4.5.3.2 Fisheries Management Act 1994

Based on a preliminary search of relevant databases (see Section 4.1.5.1), at least three species listed under the FM Act have been recorded or have habitat within the vicinity of the study area. These species (and may be more) should have been assessed for the potential to occur within the study area and if potential habitat occurs then an Eight Part Test should have been prepared for each species.

While the report states that 'the proposal will not affect any of the species listed' on the FM Act 'as they do not occur at the site due to lack of suitable aquatic habitat' (pg 4.10.93, Parker 2004), no assessment of aquatic habitat within the study area has been undertaken and compared to the habitat requirements of threatened aquatic species that may occur in the area. Without such an assessment, the presence of threatened aquatic species cannot be discounted.

4.5.3.3 Environment Protection and Biodiversity Conservation Act 1999

As for the assessment of aquatic species under the FM Act, threatened aquatic species under the EPBC Act should have been considered for their potential to occur in the vicinity of the study area and whether potential habitat occurs within the study area. Based on the outcome, assessments following the EPBC Act Administrative Guidelines of Significance should have been prepared for all threatened species with potential habitat in the study area to determine whether a Referral to the Federal Minister for the Environment is required.

4.6 Adequacy of Proposed Mitigation Measures

Mitigation measures for the proposed development are outlined in the section 'Environmental Management', starting on pg 4.10.95 of the report.

4.6.1 Buffer Zones and APZs

There are no bushland buffer areas around some existing native vegetation in the study area. Instead proposed Asset Protection Zones (APZ) extends to existing vegetation boundaries. It is arguable that the dual function of the buffer areas as APZs and bushland buffers, as is proposed in some areas, would not provide adequate protection to the vegetation communities due to the sparse spacing of canopy trees and cleared understorey required in the APZ. This is particularly inappropriate for the littoral rainforest in the study area, which requires a much denser tree canopy for an effective buffer than is suitable for an APZ. In addition, the 100 m SEPP 14 buffer in the west of the site includes a 40 m APZ, so the bushland buffer is actually only 60 m wide.

Another issue of having buffer areas that function as an APZ and bushland buffer is the species that would be planted in these areas. APZs have particular requirements for lower flammability species which are appropriate for planting within the zones. These species may not be appropriate for buffering sensitive vegetation communities, which should be buffered by plantings of species that naturally occur in the vegetation communities.

A more appropriate buffer which would provide adequate protection from indirect impacts to the native vegetation communities would be a bushland buffer planted with local native species of similar composition and in similar densities which occur in the adjoining vegetation community.

4.6.2 Revegetation and Bush Regeneration

Revegetation should use only local native species of local providence, which naturally occur in the adjoining vegetation communities. A Vegetation Management Plan should be provided detailing bush regeneration and revegetation that will be undertaken within all vegetation communities in the study area, in addition to the report detailing revegetation and weed management. Bush regeneration should use non invasive methods that encourage natural regeneration where appropriate. People undertaking the bush regeneration should be suitably qualified, or at least supervised by a suitably qualified person, to ensure best practice methods are used.

As mentioned in Section 3.2.3, the composite plan for the site indicates considerable areas of the study area to be revegetated (Figure 1), however, the landscape plans (Figure 2 and Figure 3) appear show only limited plantings within the revegetated areas. Clarification of the areas to be landscaped and the proposed abundance and density of plants is required.

4.6.3 Weed Management

While weed management has been identified as ‘ a high priority task which will be undertaken throughout the various stages of the development’ there is no reference to the preparation of a vegetation management plan to address weed management. Any vegetation management plan should take into account the recommendations/objectives of the Byron Flora and Fauna Report (Landmark Ecological Services *et al.* 1999), State of the Environment (Byron Shire Council 2004b) and Biodiversity Conservation Strategy (Byron Shire Council 2004a).

4.6.4 Wildlife Corridors

The proposed revegetation as per the concept plan (Figure 1) will improve the wildlife corridors running north to south through the subject site. However, if the revegetation plans are as portrayed in the landscape plans (Figure 2 and Figure 3) then the benefits will be reduced.

The northern wildlife corridor which is proposed to be revegetated, is partly designated to form part of the open space network, reducing the wildlife corridor to a thin strip of trees in its centre. This is likely to reduce the effectiveness of the area as a wildlife corridor.

4.6.5 Feral Pests

The impacts of three feral pest have been considered, cane toads, foxes and dogs. For each there has been little consideration of the potential for the proposed development to increase their numbers. While there is also discussion of measures that may mitigate against these pest species, some of these measures are ones that have been implemented by the local community. While revegetation around the waterbodies will enhance the habitat of native frogs and waterbirds, it will not necessary reduce the number of cane toads in the area.

In addition, there are no recommendations in the report for the preparation of a Feral Pest Management Plan to address the ongoing management of feral pests within the subject site. This plan should also include the management of feral cats.

4.6.6 Shore Bird Impacts

The report discusses the issues associated with shorebirds, especially those of disturbance by humans and dogs, but does not acknowledge or assess the impacts caused by increased human disturbance as a result of the development. Instead, it is suggested that providing brochures and signage will educate visitors adequately to prevent them from impacting on shorebirds. By recognising that residents need to be educated about sensitive areas and species, the proponent is admitting that visitors are likely to have an impact on these areas and species.

These mitigation measures recommended are considered to be inadequate to prevent increased impacts to shorebirds and therefore these impacts need to be discussed and assessed.

4.6.7 Waterbodies and Drainage Ways

Information provided on each waterway provided on pages pg 4.10.99-108 (Parker 2004), is the first description of aquatic habitat within the report (although further detail could still be provided, including information on water quality). These pages provide a brief description of aquatic habitat associated with each waterbodies and proposed mitigation measures for the proposed development. Filling of the proposed drain is also discussed, but as mentioned further, there is no hydrological assessment of the potential impacts of filling the drain on the upstream SEPP 14 wetland.

4.7 Additional Information or Assessments the Applicant Should be Required to Provide

4.7.1 General

- Further information on the proposed development should be provided in the report.
- A general impact assessment addressing potential impacts of the proposed development on flora and fauna occurring in the study area should be provided, addressing direct and indirect impacts and proposed mitigation measures.
- TSC Act Eight Part Tests (under the TSC and FM Acts) need to be redone for threatened species and Endangered Ecological Communities (including those preliminarily listed) and their habitats, answering all relevant questions for each species/community separately.
- EPBC Act Administrative Guidelines on Significance need to be addressed for threatened species and ecological communities known to occur and/or with potential habitat in the study area.
- The report abruptly ends on pg 4.10.108 without any recommendations or conclusion from the study. At a minimum a conclusion should be provided for the report.

4.7.2 Flora

- Parker (2004) should provide more detailed information regarding structure and composition of vegetation communities present in the study

area, including condition and any existing disturbances impacting the areas.

4.7.3 Aquatic Ecology

- Adequate surveys and assessment by appropriately qualified and licensed aquatic ecologist should be undertaken
- Adequate consideration of threatened species under the FM and EPBC Acts is required.

5.0 CRITICAL REVIEW OF SPECIES IMPACT STATEMENT

Report is difficult to follow, has poor structure and is generally lacking in detail. Current impacts are not considered in sufficient detail and future stages of proposed development are not provided although discussed in the SEE. It is difficult to determine areas of impacts, as the plans provided are at varying scales.

5.1 Adequacy of Methodology

5.1.1 Flora

5.1.1.1 Survey Design

Parker (2006a) states that quadrat surveys for Endangered Ecological Communities are not required as described in the DGRs for species 'not affected'. This is not accurate, as the DGRs state that at least one quadrat is required in each EEC that occurs in the study area should the community occur off the subject site (Parker 2006b). No quadrat sampling was undertaken in the study area.

Surveys should be designed to target subject species, not affected species. It appears that Parker (2006a) has designed the surveys to target what he considers an affected species, rather than designing the surveys to target all threatened species, populations and communities that may occur in the area and assessing which of these will be affected once the data has been analysed. Affected species should not be considered until all survey work has been completed and only when the potential impact of the proposal is being assessed on what was recorded in the study area.

5.1.1.2 Survey Effort

Information regarding how the survey design and effort considered threatened species and likelihood of detection was not provided. Survey effort, seasons and dates have not been provided for flora surveys. Parker (2006a) states in relation to flora surveys undertaken 'meandering transects and opportunistic sightings during fauna survey.' Furthermore, the areas surveyed for flora surveys in the study area were not mapped. This level of information does not allow for assessment of survey effort and adequacy of seasonality of surveys for detection of cryptic species.

5.1.2 Fauna

5.1.2.1 Requirement to survey

As this section of the SIS (Section 4.4) is almost identical to the Fauna Survey Methods section of the Flora and Fauna Survey report (Parker 2004) the same comments apply as those stated in Section 4.1.4 of this report.

5.1.2.2 Documentation of survey effort and technique

This section of the SIS (Section 4.4) has also been copied from Parker (2004) and so the same comments apply as those stated in Section 4.1.4 of this report. Additionally, the following DGRs have not been addressed:

- Full AMG references for the survey sites have not been provided;
- The table (Table 4.2) showing compliance with the DGRs survey methods does not provide enough detail to determine whether the DGRs were met;
- The time taken to complete each survey (e.g. number of person hours, duration of call playback) and survey effort per vegetation community is not provided in enough detail for some survey types (see Section 4.1.4 above); and,
- For each subject species targeted, the area covered by the surveys is not correlated to the amount of, and proportion of, suitable habitat in the study area.

5.1.3 Aquatic Ecology

Methodology for fish surveys has been included under Section 4.4.3. There is no requirement for these surveys in the DG's requirements and are not appropriate for inclusion in this report (i.e. SIS under the TSC Act, fish listed under the FM Act).

5.2 Suitability of Surveys

5.2.1 Flora

5.2.1.1 Targeted or Seasonal Surveys

There is no mention of seasonal targeted surveys for threatened plant species. In fact it appears that no seasonal surveys have been undertaken, as implied in the statement in reference to time of year for flora surveys (Parker 2006a) "No seasonal requirements apply". The DGRs specify seasonal requirements for a

number of subject species (Appendix 1, Parker 2006b) (*Allocasuarina defungens*, *Chamaesyce psammogeton*, *Diuris byronensis*, *Geodorum densifolium*, *Phaius australis*, *P. tankervilleae*, *Pterostylis nigricans*). Some of the listed species (*Geodorum densifolium*, *Diuris byronensis*, *Pterostylis nigricans*) are dormant when not in flower. It appears that seasonal targeted surveys have not been undertaken for a number of DGR suggested subject species that require such surveys.

It is difficult to assess the suitability of the surveys on the information provided in the report. There is no mention of survey effort or seasonality of surveys, nor is a map provided showing the areas that were surveyed.

5.3 Suitability of Data and Information Used in the Assessment

5.3.1 Flora

5.3.1.1 Data

A list of threatened fauna species known from the locality or recorded at the site has been provided in the SIS, but a similar list for flora is not provided (Parker 2006a). This list is necessary in assisting in development of a list of 'subject species' for the SIS. It is not clear whether previous records of threatened flora from DEC and other relevant databases, such as the Byron Flora and Fauna Study, have been considered in the SIS.

5.3.1.2 Vegetation Community Descriptions

Descriptions of vegetation communities are brief and do not include discussion of dominant species, structure, dominance of weed species, condition of the vegetation and disturbances present. This makes it difficult to envisage the different vegetation communities in the study area and their condition at the time of survey. Knowing the condition of the vegetation communities in the study area helps to design mitigation and management measures to reduce ongoing impacts and prevent further disturbances.

The lack of detailed floristic and structural information makes it difficult to determine whether the vegetation communities meet the definitions of Endangered Ecological Communities. This is of particular concern as it appears that Freshwater Wetlands on coastal floodplains and Subtropical Coastal Floodplain Forest, which are EECs listed on the TSC Act, may be present in the study area, but the information provided is inadequate and prevents independent assessments to be made.

It appears than a number of vegetation communities that appear to meet the definition of Swamp Sclerophyll Forest in the study area (e.g. *Eucalyptus robusta*, *leptospermum trinervium*, *Melaleuca quinquenervia* mid-high open forest) have not been considered as part of the community. However, it is difficult to determine whether these communities qualify as part of the EEC based on the floristic information provided in the report.

Potential impacts on EECs occurring in the study area have not been discussed, despite the proposed development, including proposed roads and APZs, directly adjoining the EECs in many areas.

5.3.1.3 Subject Species

DGRs (Appendix 1, Parker 2006b) define ‘subject species’ as those threatened and significant species, populations and ecological communities that are known or considered likely to occur in the study area. This is taken to mean any threatened species known or potentially (with potential habitat) occurring in the study area. The list of ‘subject species’ is used to design survey techniques, effort and seasonality, to ensure all areas of potential habitat are adequately surveyed to detect cryptic and/or threatened species. Therefore, it is important to ensure the list of subject species is thorough, as the list dictates which species are considered further in the SIS.

It appears that Parker (2006a) has selected the list of subject plant species based on the results of the previous surveys undertaken in the area, rather than selecting subject species based on the presence of suitable habitat in the area and subsequently designing surveys to target these species. Many threatened plant species with potential habitat in the study area have not been included in the list of subject species. In fact, the only threatened plant species included in the list of subject species are those recorded in the study area in previous surveys.

Justification for eliminating threatened species from the subject species list provided in the DGRs was not “a fully documented justification, robust to external examination”, as required in the DGRs (Appendix 1, Parker 2006b). It appears that most of the threatened species listed in the DGRs as consideration for subject species were excluded on the basis that potential habitat has been preserved and buffered (Table 1). This does not account for indirect impacts. Furthermore, proposed buffers consist of APZs only in some areas, which generally contain sparse vegetation cover and would not act as sufficient buffer areas to sensitive habitats.

Survey effort of any targeted or seasonal surveys that may have been conducted for the threatened species with potential habitat in the study area has not been documented in the SIS, so it is difficult to assess whether surveys have been

adequate enough to justify the elimination of the threatened species from the list of subject species.

Table 1: Threatened plant species excluded as subject species

Threatened species	Parker (2006a) justification for exclusion from 'subject species' list	Comments	Seasonal targeted Survey required? (Appendix 1, Parker 2006b)
<i>Arthaxon hispidium</i> , <i>Acronychia littoralis</i> , <i>Amorphospermum whitei</i> , <i>Archidendron hendersonii</i> , <i>Xylosma terra-reginae</i>	Potential habitat exists in littoral rainforest. The littoral rainforest will be preserved and buffered from the proposed development	Potential habitat exists so should be included as subject species. Buffer areas appear to consist of a 20 m APZ along the boundary of littoral rainforest. APZ's require much sparser tree canopy than is suitable for an effective littoral rainforest bushland buffer.	No
<i>Allocasuarina defungens</i>	No suitable habitat recorded. Known from Byron Bay Graminoid Heathland in Arawakal National Park.	DEC(2005b) lists potential habitat as tall heath on sand, but can also occur on clay soils and sandstone. Potential habitat may exist, but difficult to tell from brief vegetation community descriptions provided in Parker (2006).	Fruit required to confirm species.
<i>Chamaesyce psammogeton</i>	Potential habitat occurs in study area in frontal dunes. Potential habitat preserved.	Potential habitat exists so should be included as subject species.	Yes. During flowering period (thought to be summer).
<i>Diuris byronensis</i>	No suitable habitat recorded on site.	DEC (2005a) includes littoral rainforest as suitable habitat for this species, which occurs on site. Targeted surveys should have been conducted for this species during its flowering period, as it is a cryptic species which is dormant for part of the year. It is not clear whether these surveys were carried out. Potential habitat exists so should be included as subject species.	Yes. Dormant when not in flower or with capsules. Flowering period July to September.
<i>Drynaria rigidula</i>	(not considered)	DEC threatened species information lists rainforest, moist eucalypt forest and swamp forest as suitable habitat for this species, which occurs on site. Potential habitat exists so should be included as subject species.	No

Threatened species	Parker (2006a) justification for exclusion from 'subject species' list	Comments	Seasonal targeted Survey required? (Appendix 1, Parker 2006b)
<i>Hibbertia hexandra</i>	Potential habitat existing in rainforest, heath and open forest in the study area. Potential habitat preserved.	Potential habitat exists so should be included as subject species.	No
<i>Geodorum densifolium</i>	May occur in the frontal dunes or littoral rainforest in the study area.	Targeted surveys should have been conducted for this species in its flowering period (summer), as it is a cryptic species which is dormant in winter. It is not clear whether these surveys were carried out. Potential habitat exists so should be included as subject species.	Yes. Dormant in winter. Flowering period December to January.
<i>Phaius australis</i>	Unlikely to occur at the site. Potential habitat preserved.	DEC (2005d) lists potential habitat as occurring in swampy grassland or swampy forest including rainforest, eucalypt or paperbark forest, mostly in coastal areas. Potential habitat exists so should be included as subject species.	Yes. Flowering period September to October.
<i>Phaius tankervilleae</i>	Possibly extinct in NSW	DEC (2005c) lists potential habitat as swampy grassland or swampy forest, including rainforest, eucalypt and paperbark forest. Potential habitat exists so should be included as subject species.	Yes. Flowering period September to October.
<i>Pultenaea maritima</i>	Suitable habitat occurs in coastal heath on the site, all of which will be preserved.	Potential habitat exists so should be included as subject species.	No
<i>Pterostylis nigricans</i>	Potential habitat occurs in heath-leaf Banksia association. Potential habitat retained.	Targeted surveys should have been conducted for this species in its flowering period, as it is a cryptic species which is dormant for part of the year. It is not clear whether these surveys were carried out. Potential habitat exists so should be included as subject species.	Yes. Dormant when not in flower or with capsules. Flowering period March to May.

5.3.2 Fauna

5.3.2.1 Identifying subject species, populations and ecological communities

As discussed in Section 4.3.2 above for the Flora and Fauna Survey report (Parker 2004), Subject Species have not been identified in an appropriate manner. The DGRs define ‘Subject Species’ as those threatened and significant species, populations and ecological communities that are known or considered likely to occur in the study area. Table 4.1 of the SIS lists 66 threatened animal species that have been previously located in the study area, and yet Table 5.1 of the SIS only lists 25 animal species as Subject Species. Following the DGRs definition, all threatened or significant species (or those with potential habitat) previously recorded in or near the study area should be included as Subject Species. This means that all 66 species identified in Table 4.1 of the SIS must be included as Subject Species, as well as any other species with potential habitat within the study area. Table 5.1 of the SIS lists 90 threatened animal species, but there is little or no justification for not including 65 of these as Subject Species. As stated in the DGRs, “species ... may be excluded from further consideration as Subject Species only if a fully documented justification, robust to external examination, is provided”. This justification is not included in enough detail within the SIS.

5.3.2.2 Survey Results

This section of the SIS (Section 4.9) has also been copied from Parker (Parker 2004) and so the same comments apply as those stated in Section 4.3.2 of this report.

5.3.2.3 Habitat mapping

Section 4.4 of the DGRs state that “colour and computer generated maps of potential and suitable habitat and assessment of the proportion of the habitat to be affected should be provided for each of the Subject Species”. These maps have been produced for each Subject Species, although there is no differentiation made between known and potential habitat or between foraging, roosting and breeding habitat. All the habitat maps are noted as potential habitat, even when previous records exist within the area. In such cases, such habitat should be marked as known habitat. Conversely, in some instances previous records exist outside the area demarcated as potential habitat. Additionally, the maps are combined for the Black Flying-fox, Grey-headed Flying-fox, Common Blossom Bat, Greater Broad-nosed Bat, Hoary Wattled Bat, Large Bent-wing Bat, Little Bent-wing Bat and Northern Long-eared Bat. The DGRs do not state that a separate habitat map should be presented for each species, so as long as known and potential habitat or foraging, roosting and breeding habitat is the same for

each species, and these can be displayed clearly on the same map, it is considered acceptable to combine species on one map.

The habitat maps for the following species are not considered accurate:

- Wallum Froglet and Wallum Sedge-frog – the Melaleuca forest and SEPP 14 wetland areas in the south of the study area should be considered as potential habitat;
- Black Bittern – the Melaleuca forest and wetland areas (particularly the SEPP 14 wetland) in the north of the study area are considered to be potential habitat;
- Black-necked Stork and Brolga – all wetlands and open woodlands (including the golf course and “built environment”) within the study area are considered to be potential habitat;
- Bush Stone-Curlew – this species prefers lightly timbered open forest and woodland or partly cleared farmland. The golf course and development footprint area should be considered as known habitat as this species has been previously recorded in that area;
- Beach Stone-curlew and Pied Oyster Catcher – the entire estuarine and beach area is considered to be potential habitat, and some is known habitat;
- Little Tern – the estuary should also be considered as potential habitat;
- Common Planigale – all rainforest, forest, woodland and grassland areas need to be considered as potential habitat;
- Koala – known records/habitat exist outside the mapped potential habitat area;
- Long-nosed Potoroo – all forest types should be considered to be potential habitat, particularly the Melaleuca forest in the south of the study area: and,
- Fishing Bat (*Myotis adversus*) – not all the wetland areas are included as potential habitat.

It is recognised that some areas provide better habitat than others, but all known and potential habitat must be displayed on the habitat maps. If the proponent wishes to distinguish between habitat of different quality then this would be welcomed. However, nearly all the species habitat maps do not include the development footprint (“built environment”) as potential or known habitat, which

is not only false, but extremely misleading as it suggests that the development would not have any direct impacts on threatened species habitat, when in fact it would.

Habitat maps need to be provided for all threatened species with known or potential habitat in the study area (Subject Species). As discussed above in this section, the Subject Species have not been identified appropriately and so many of these maps have not been provided.

Figures 5.25 to 5.38 of the SIS do not contain legends. It is not clear from the discussion of, or the figures themselves, which buffers would be revegetated. The figure on page 215 of the SIS is not numbered and does not have title. Additionally, the buffer on the figure on page 215 of the SIS does not appear to correlate to the APZ on Figure 5.35 of the SIS.

5.3.3 Aquatic Ecology

Results of the fish surveys conducted for the flora and fauna report (Parker 2004) have been included in the SIS under Section 4.9.4. As this is SIS prepared under the TSC Act, it is not appropriate to include the results of the fish surveys as they fall under the jurisdiction of the FM Act.

5.4 Reliability of Predicted Impacts of the Proposal

Location of electricity trenches and other ancillary infrastructure needs to be mapped and the impacts of these on ecological values discussed. The potential impacts of the disturbance of acid sulphate soils on ecological values needs to be discussed in more detail.

5.4.1 Flora

Parker (2006a) predicts that the proposed development will not have any adverse direct or indirect impacts on threatened species and ecological communities due to the presence of substantial buffer areas to the native vegetation. This assessment is questionable due to the dual function of the proposed buffer zones in many places, which also serve as APZs. The vegetation composition and density suitable for an APZ is not suitable for a bushland buffer zone as it would provide little buffering from impacts associated with the proposed development.

The predicted impacts of the proposal in Parker (2006a) are therefore unreliable, based on the inadequacy of the proposed buffer zones which Parker (2006a) predicts will mitigate against all indirect impacts. It is best to take a conservative approach to ensure that all possible impacts are mitigated adequately.

5.4.2 Fauna

Section 5.4 of the SIS states that “no threatened species or Endangered Ecological Communities are likely to be adversely affected by this proposal” because construction will not take place outside the current “built environment”, buffers will be applied to sensitive areas/habitats, threatened plant species will be retained and rehabilitation and revegetation will take place. As discussed in Section 4.4.2 of this report, the assumption by the author that there will be no impacts outside the development footprint is not supported: the discrepancy concerning revegetation between the Fauna and Flora Survey/SIS and the landscape plan (Figure 1 to Figure 4) needs to be clarified; the impacts from increased human disturbance on ground dwelling/nesting birds needs to be discussed, including relating the number of people expected on the site at different times of the year to life history patterns of the ground dwelling/nesting birds; and, greater discussion of the number of trees to be removed from the “built environment”, including whether any hollow bearing trees would be removed. As discussed above in Section 5.3.2, there needs to be recognition that the development footprint contains habitat for threatened species and these impacts need to be discussed and assessed.

5.5 Significance of Likely Impacts of the Proposal

5.5.1 Flora

5.5.1.1 Affected Species

DGRs (Appendix 1, Parker 2006b) defines ‘affected species’ as subject species likely to be affected by the proposal. These are species that are not necessarily significantly impacted by the proposal, but a species that is likely to be impacted upon to any degree. In an assessment of which species are likely to be affected, DGRs state that proposed ameliorative or compensatory measures cannot be considered. Each subject species should be assessed to identify those threatened species likely to be affected by the proposal. The results of this assessment lead to a list of ‘affected species’, which are further assessed in the SIS.

Parker (2006a) has concluded that all plant ‘subject species’ are not ‘affected species’ and has justified the exclusion of all ‘subject species’ as ‘affected species’ by referring to proposed mitigation measures, specifically the presence of ‘substantial buffers’ applied to sensitive and significant areas. This approach is inconsistent with the DGRs. It would be more appropriate to take a precautionary approach and include any species with potential habitat that may be impacted prior to considering reduced impacts due to mitigation measures. It is possible that the proposal will impact on the threatened species and ecological communities through indirect impacts such as edge effects.

In determining there are no ‘affected species,’ Parker (2006a) has not considered any plant ‘subject species’ further in the SIS document and discussion of the conservation status, local and regional abundance, known local populations, habitat utilisation, regional abundance, habitat values, extent of habitat removal and consideration of corridors have not been provided. This is despite the threatened plant species known to occur in the study area existing within the existing landscaped areas and near edges of existing vegetation, areas which are highly likely to be impacted by the proposed development.

It is likely that the significance of the impacts predicted by Parker (2006a) is an underestimate, as Parker (2006a) has assumed best case scenario, rather than taking a precautionary approach. The list of affected species should be expanded to include all species that may be impacted on to any degree by the proposed development, ensuring any potential impacts to all these species are considered in detail and therefore mitigated against.

5.5.1.2 Endangered Ecological Communities

The assessment of likely impacts on EECs consists of a single statement ‘These communities are extensively buffered (e.g. up to 100 m) and therefore the proposal will have no direct or indirect impact’ (Parker 2006a). This brief assessment fails to consider indirect impacts highlighted in the DGRs (Appendix 1, Parker 2006b) such as edge effects, fire management, increased visitation, changes to lighting, changes to water quality and changes to surface and subsurface water flows. Furthermore, the proposed buffers are simply an Inner Protection Areas (IPA) in many places, which require significantly reduced canopy cover and cleared understorey to reduce fire risk. This is not adequate for a buffer zone to Endangered Ecological Communities in the study area, especially if these buffers are used as mitigation for all possible direct and indirect impacts on these communities.

5.5.2 Fauna

Affected species have not been identified within the SIS. The statement in Section 5.4 (page 178) of the SIS that “no threatened species or Endangered Ecological Communities are likely to be adversely affected by this proposal” is not supported. As discussed above, increased visitors will result in increased human disturbances, which in turn will result in increased impacts to ground dwelling/nesting bird species, particularly those that inhabit the estuary and beach areas. Additionally, the development footprint contains habitat for a number of threatened species and these species are likely to be negatively impacted by the proposal. Therefore, following the DGRs definition of “affected species”, all species with known or potential habitat within the development footprint and all ground dwelling/nesting bird species are considered to be affected species. The exclusion of any other Subject Species as affected species

needs to be justified, incorporating survey results, habitat mapping, identification and analysis of likely impacts. This justification has not been done adequately in the SIS. As stated in the DGRs, TSC Act Section 5 assessments must be completed and Sections 5.2-5.4 must be addressed for all affected species.

Although DEC and Byron Council corridors have been identified in Figures 3.11 and 3.12 respectively, there is no discussion regarding the function of these corridors.

5.6 Adequacy of Proposed Mitigation Measures

5.6.1.1 Buffer Zones and APZs

The proposed buffers zones in the study area perform a dual function, acting as buffers to mitigate against impacts on native vegetation communities and as the APZs. All APZs in the study area are required to be IPA which will require the clearing of all understorey vegetation (except for rainforest trees or shrubs), with a minimal ground fuel maintained (mown grass, paving, concrete, or fine fuel of less than 3 tonnes per hectare); garden and landscaped areas occupying no more than 5% of the APZ and containing low flammability species approved by the NSW Rural Fire Service; and plantings occurring only in isolated clumps. This is not appropriate for a buffer to significant vegetation communities and habitats, such as littoral rainforest. With the exception of rainforest species, Australian native plants are generally not low flammability species, as would be appropriate for an APZ. Therefore, the APZ may require planting of species not local to the area, particularly not to the adjoining native vegetation. Furthermore, the density of plantings required in an IPA is of a much lower density than is appropriate for a vegetated buffer designed to mitigate against indirect impacts of the proposed development.

It is recommended that bushland buffer zones of at least 20 m width, planted with species native to the adjoining vegetation community, are incorporated into the proposal. APZ's should adjoin these bushland buffers, not be incorporated as part of them. Providing such buffers is more likely to adequately protect the native vegetation in the study area from adjoining land uses associated with the proposed development.

Furthermore, if these APZ/buffer zones are to be used as mitigation for all potential direct and indirect impacts to the vegetation in the study area, then these buffers should be established before the start of any construction works to ensure impacts during construction are also prevented.

5.6.1.2 Revegetation and Bush Regeneration

Local native species of local provenance that naturally occur in adjacent vegetation communities should be used in any plantings. The proposal to plant littoral rainforest species to buffer vegetation communities such as Swamp Sclerophyll Forest (as specified in the Waterbody Management Plan) is inappropriate and is likely to result in the further degradation of these communities with invasion of non characteristic species. Revegetation should only use species that naturally occur in the adjacent vegetation community that is being buffered. Plantings within and around EECs should be careful to use locally sourced local native species specific to the EEC.

The northern wildlife corridor proposed for revegetation area is unlikely to be effective, as a large part of this area is designated as part of the open space network, reducing the wildlife corridor to a thin strip of trees in its centre.

The Vegetation Management and Reafforestation Proposal (Parker 2006c) is very brief. There is no mention of any bush regeneration works to be carried out in any existing native vegetation communities. A Vegetation Management Plan should be provided detailing bush regeneration and revegetation that will be undertaken within all vegetation communities in the study area, not just the frontal dunes as provided. Bush regeneration should use non invasive methods that encourage natural regeneration where appropriate (as is proposed for the frontal dunes). People undertaking the bush regeneration should be suitably qualified to ensure best practice methods are used and any adverse impacts are minimised. Bush regeneration of all native vegetation communities should be ongoing to minimise the indirect impacts of the proposed development that are inevitably linked to increased densities of people and development, such as weed invasion and rubbish dumping, on the surrounding native flora and fauna. Bush regeneration should also be monitored, with reports submitted to Council, to ensure that methods used are effective and achieving desired results.

5.6.1.3 Beach Access/Dune Areas

More details need to be provided in the DMP about the type of structure that is proposed to be constructed at the beach access site. It is inadequate to not provide a structure as the current erosion of the frontal dune will be exacerbated by the increased human usage. It is not acceptable to state that there will not be an increase in human visitation to the site because the number of sewage ETs would not increase. A detailed analysis comparing the current human usage with what is expected once the development is operational is required, whether there is an increase in human visitation or not. Also, a discussion on how illegal tracks through the dunes and other vegetated areas will be managed and rehabilitated needs to be provided.

More details are required to explain how human use of the “emergency beach access” to the Belongil estuary will be prevented. As acknowledged in the SIS, this is a highly sensitive ecological area, and all non-emergency use must be prevented.

Finally, the long-term responsibility for implementation, funding and performance of the DMP needs to be discussed and assured. To this regard, binding contracts or conditions of sale must be produced which ensure the DMP is implemented in perpetuity.

5.6.1.4 Waterbodies

More detail needs to be provided in the Waterbody Management Plan (WMP) on objectives of the plan, what it is managing against, values of the waterbodies, measures/actions to be undertaken, including timeframe. Such information need to be provided for pre, during and post construction. As mentioned previously, the plants that have been identified for the creation of buffers in around each waterbody are largely unsuitable as they are wetland plants that require water to survive, so are unlikely to survive as part of a terrestrial buffer.

Consideration should also be made in the WMP of the potential for the waterbodies to be Freshwater Wetlands (EEC listed under the TSC Act, especially the more diverse waterbodies. For these waterbodies, a buffer greater than 5 m should be provided to help reduce rubbish, pollutants and sediments from entering these waterways from the proposed development and the impacts as a result of increased human usage of the site such as physical damage to the waterbodies, disturbance of species and habitats, and introduction of weed species. Similarly a buffer of greater than 5 m should be provided for waterbodies that are link to Belongil Estuary.

As for the DMP, the long-term responsibility for implementation, funding and performance of the WMP needs to be discussed and assured. To this regard, binding contracts or conditions of sale must be produced which ensure the DMP is implemented in perpetuity.

5.6.1.5 Public Access

The areas supporting native vegetation on the site are marked as conservation/community lot. Parts of this lot are marked as ‘Possible future festival lawn site’. It is not specified what sort of public access will be provided in these areas. There should be a clear distinction between the conservation lot and the community lot in the study area. Combining such conflicting uses reduces the effectiveness of the conservation lot in achieving its purpose, which is to conserve the native flora and fauna in the area. It is recommended that

public access be restricted in the native vegetation areas and their buffers to reduce indirect impacts from larger numbers of people using the site.

5.6.1.6 Exotic Fauna Control

The impacts of two feral pest have been considered in the Exotic Fauna Control section, cane toads and foxes. For each there has been little consideration of the potential for the proposed development to increase their numbers. While there is also discussion of measures that may mitigate against these pest species, some of these measures are ones that have been implemented by the local community. While revegetation around the waterbodies will enhance the habitat of native frogs and waterbirds, it will not necessary reduce the number of cane toads in the area.

This plan should also include the management of feral cats.

5.6.1.7 Environmental Education

It is stated in the SIS that people staying in the development would be educated about the sensitivities of the marine, estuarine and beach environments through brochures, fencing and signage. This proactive conservation is applauded and the mitigation from doing this is recognised. However, as discussed above, there is no recognition that the increased number of residents on the site would result in increased impacts to ground dwelling/nesting birds and marine species through increased human disturbance. It is naïve to assume that educating residents about environmentally sensitive areas will stop them disturbing or damaging those areas. It is stated within the SIS that despite signage residents from the neighbouring suburb continue to take their dogs into environmentally sensitive areas. A realistic description of both the increase in human disturbance and the impacts of this on ecological values needs to be discussed.

5.7 Compliance of SIS with DG's Requirements

An assessment of the compliance of the SIS with the DG's requirements is provided in Table 2. This table also includes comments from Appendix 6 of the SIS in which Parker (2006b) assesses his compliance with the DG's requirements.

Table 2: Assessment of compliance with DG's requirements (DGRs)

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
A copy of the statement, from Taylorise Pty Ltd, as the owner of the land, consenting to the making of the application by SJ Connelly, is to be provided with the SIS	(Not considered in Appendix 6 of the SIS, Parker 2006a, b, c)	Not provided in SIS
1. Form of the species impact statement – Volume 1		
1.1 A species impact statement must be in writing (Section 109 (1)).	✓	Satisfies DGRs
1.2 A species impact statement must be signed by the principal author of the statement and by: (a) the applicant for the licence, or (b) if the species impact statement is prepared for the purposes of the Environmental Planning and Assessment Act 1979, the applicant for development consent or the proponent of the activity proposed to be carried out (as the case requires) Section 109(2)).	Volume 1	Satisfies DGRs
It is a statutory requirement that the SIS be in writing. In addition to the hard copies of all relevant documents, a copy of the SIS, together with all relevant maps and appendices shall be provided to the Director-General in electronic form (preferably CD).	Production stage	Satisfies DGRs

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
It is also a statutory requirement that the SIS be signed by the applicant for the development consent of the proposal. The DEC will assume that, in signing the SIS, the applicant is aware of any avoidance, ameliorative or compensatory measures contained in the SIS and will support the implementation of these. The DEC will also assume that the applicant is aware of the location of threatened species and their habitat(s) on the subject site as provided in the SIS. Should the owner of the land sign a statement consenting to the making of the development application by the applicant, the DEC will assume that the owner is aware of any avoidance, ameliorative or compensatory measures contained in the SIS and will support the implementation of these. It will also be assumed that the owner is aware of the location of threatened species and their habitat(s) on the subject site as provided in the SIS.	Volume 1	Satisfies DGRs
In discussing the impacts of the proposal and the proposed ameliorative and compensatory measures the SIS must be worded with definitive and quantifiable words. For example – what actions are proposed to take place, what areas or features will be destroyed/modified from the proposed actions, how it is proposed to mitigate those impacts, where the proposed action will occur, etc. Likely, probable and possible impacts should be discussed and justified. They may be used to further develop the understanding of the proposal after the facts have been presented. Intangible or unquantifiable language, such as should, could, maybe, where possible, if possible, probably etc. should not be used elsewhere in the document. Terms such as “should”, “could”, “maybe” and “probably” may imply alternative options or considerations are valid. Where they are used, details of these options are to be provided. Terms such as “where possible”, “if possible” and “probably” require additional considerations to be presented that explain what will be done if a proposal eventuates as not being possible or where it probably cannot be done.	✓	Satisfies DGRs
Numeric figures are to be used, wherever relevant, including to quantify habitat loss, habitat replacement, area of habitat and amount of habitat features.	No habitat loss, thus area not supplied. Habitat replacement illustrated in Volume 3 and area of vegetation associations in Fig. 4.2	Habitat losses will occur (see discussion in Section 5.4.2 of this report) No quantification of habitat features

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
2. Contextual information - Section 3		
<u>1 2.1.1 Description of the proposal</u> <i>A species impact statement must include a full description of the action proposed, including its nature, extent, location, timing and layout (Section 110 (1)).</i>	3.1.2	Information is provided in Section 3.1 on nature, extent, location and layout of development. No information is provided on timing
A full description of the pre-construction, construction and occupation phases of the proposal and all associated actions must be provided. These actions may occur on or off the subject site. They may include, but need not be restricted to, the type of auxiliary infrastructure such as installation, operation and maintenance of utilities (e.g. sewerage, water, power etc) and the location of any auxiliary infrastructure, walking tracks, cycleways, fences, fire protection zones and access and transport routes etc.	3.1 – The development: its extent, location, timing and layout 3.3 – Reshaping and filling of drains 3.4 – Ancillary services 3.5 – Recreation and open space network 3.6 – Changes in surface water flows and proposed earthworks 5.1 – Installation and maintenance of buildings and utilities 5.2 – Electricity 5.3 – Staging of development	Location of electricity trenches and other ancillary infrastructure needs to be mapped. The potential impacts of the disturbance of acid sulphate soils during construction needs to be discussed in more detail.
the area to be impacted by the various proposals is to be provided on a map at a scale that can overlay the threatened species and ecological community habitat mapping e.g. the area identified as being affected by increased lighting from the proposal is to be identified and able to be overlaid with breeding and foraging habitat of species likely to be affected by lighting;	Fig. 3.10 overlay of infrastructure over aerial photo, also enlarged overlay instead of acetate overlay. Overlay illustrates that only the existing developed part of the site and part of the golf course proposed for development	Figure 3.10 does not provide details of beach access point for the proposed development In addition, Figure 3.10 has no legend to define what is being illustrated in the figure
details of any proposed mosquito and midge control;	3.2	Outlined in Section 3.2
details of the proposed recreational facilities;	3.12	Outlined in Section 3.1.2, 3.1.3, 3.5

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
details of any proposed fill and proposed reshaping and filling of drains; and	3.3	Outlined in Section 3.3 No assessment of hydrological impacts due to filling of change, particularly on SEPP 14 wetland
details of ancillary services (including bike racks, water supply, electricity and communications infrastructure);	S.3.4 and in plan set	Outlined in Section 3.4
details of the recreation and open space network (including pedestrian, cycle and service vehicle movement, buffer zones (for asset protection zones and for protection of SEPP 14 Wetlands), and public car parking for day visitors); and	3.5 Fig. 3.1- Open Space network Fig. 3.2 Fig. 3.3 Fig. 3.9 Detail on pedestrian, cycle, service movement and car parking in plan set	Outlined in Section 3.5
details of any likely changes in surface water flows or proposed earthworks are to be provided.	3.6	Outlined in Section 3.6. No assessment of impact of
This section must include the timetable that details the actions to be carried out in each of the pre-construction, construction and occupation phases of the proposed development.	Section 5.3 - Staging	No details provided on timing in Section 3 Contextual Information. Limited information is provided in Section 5.3.

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
Definition of SIS study area The SIS study area must be defined. The location, size and dimensions of study area shall be provided. In defining the boundaries of the study area, consideration shall be given to known and possible indirect effects of the proposal on the area surrounding the subject site. Indirect effects may occur on the subject site, adjacent to the subject site and in some cases may occur kilometres from the subject site. Indirect impacts are often proportionally less with the distance from the subject site. Regardless of this, the extent of the known, likely, or anticipated indirect impacts on the subject site and in the study area must be included. Examples of such indirect effects include habitat fragmentation, severance of vegetation corridors, altered hydrological regimes, soil erosion, pollution, fauna road deaths and increased human presence.	Study area is described in Section 3.7 and illustrated in Figs. 3.8, 3.9 and 3.13	Study area is defined in Section 3.8. While the written definition includes SEPP 14 wetlands adjoining the proposed development, Belongil Estuary, Belongil Beach, Cape Byron State Conservation Area, Cape Byron Marine Park and Tyagarah Nature Reserve, the figures illustrating the study area do not support this definition (study area in figures reduced compared with written definition – more similar to definition of subject site). In fact, the study area illustrated in Figure 3.8 is basically the same as that illustrated in Figure 3.7 Site plan In addition, all subsequent figures show the reduced study area
The following features must be included in the study area: any SEPP 14 Coastal Wetland adjacent to the proposed development, Belongil Creek, Belongil Estuary, Belongil Beach, Cape Byron State Conservation Area, Cape Byron Marine Park, Tyagarah Nature Reserve, and the off-site location proposed for the storage of excess sludge from the sewerage treatment plant.	Fig. 3.8	Throughout the SIS reference to the study area appears to actually more accurately reflects the subject site definition, especially in the determination of subject species.
<u>2.1.2 Description of SIS study area</u> The description of the study area must include: The vegetation types, including identification of the classification system used in the SIS and a listing of the amount (in hectares) of each vegetation community in the study area.	Vegetation and classification system in Table 4.5 & 4.6; Vegetation associations in Table 4.7 Areas of vegetation associations in Fig. 4.2	Details of vegetation communities are found in Section 4.7. Vegetation association shown in Figure 3.14
An examination of previous land uses and events, and the effect of these land uses and events on the study area. Examples of such land uses and events are clearing, timber felling, draining, recreational use and agricultural activities.	1.3 3.7.2	Information on land use history provided in 3.7.1-3 Very limited discussion of past and current impacts on the study area is provided in 3.7.4

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
An examination of the fire history, or at least the time since the last fire, for the subject site is to be provided. Ideally, information on the frequency, season and intensity of fire events on the subject site will be provided. To adequately address this requirement, it may be necessary to consider fire events in the surrounding landscape.	Section 5 3.7.8	Fire history described in Section 3.7.10
The local government land zoning and any proposed rezoning, and an examination of the degree of protection that current zoning and any proposed rezoning provides or will provide to native vegetation and threatened species, populations and ecological communities on the subject site and in the study area and the locality.	3.7.3 3.7.4 3.7.5 Fig. 3.5 Fig. 3.6	Information on land zoning provided in 3.7.5-6, including objective of each zone
The land tenure and any proposed changes (e.g. acquisition by DEC as a Nature Reserve, National Park, Regional Park etc), and an examination of the degree of protection that current land tenures and any proposed land tenures provides or will provide to native vegetation and threatened species in the study area.	3.7.6	Land tenure considered in 3.7.8
State Environmental Planning Policies (e.g. SEPP 14 Coastal Wetlands, SEPP 44 Koala Habitat Protection, SEPP 71 Coastal Protection) and an examination of the degree of protection these policies provide to native vegetation and threatened species on the subject site and in the study area.	3.7.7 Fig. 3.8	Relevant SEPP's considered in 3.7.9 No examination of the degree of protection provided by SEPP 14 wetlands
<u>2.2 Provision of relevant maps, plans and photographs</u> topographic map of the subject site and study area at a scale of 1:25000 shall be provided. The map should also show vegetated and cleared areas in the immediate area and current activities, infrastructure and use of this land.	Fig. 3.9	Topographic map of area provided in Figure 3.9, aerial photography provided in 3.13
A summary plan of the subject site and study area shall be provided at an approximate scale of 1:6000 that details the location of the proposal and location of works on site, including sewerage, water pipelines, stormwater systems, powerlines, fire management zones, fences, walking tracks, and any other works proposed. A copy of this plan shall also be provided as a clear overlay at the same scale as the summary vegetation map. It must be able to be laid over the vegetation map to clearly indicate location of impacts.	Map KP01 Fig. 3.10 Clear overlay same scale as veg map not supplied as development is only 15% of site. An alternate overlay is provided in Fig. 3.10	Figure 3.10 shows infrastructure associated with the proposed development, but there is no legend to explain the figure Figure 3.10 does not include proposed beach access
Fire management zones are to be mapped as per the requirements in the "Planning for Bushfire Protection" Guidelines (2001) and the Rural Fires Act 1997 and the Rural Fires and Environmental Assessment Amendment Act 2002.	Figs. 5.32, 5.34, 5.35, 5.36, 5.39	Mapped as indicated

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
A summary vegetation map of the study area shall be provided at the same scale as the summary plan. This map will show the location and type of all vegetation communities present within the study area.	Fig. 3.14, 3.15	Mapped as indicated
An additional map is to provide the location of all <i>Banksia</i> plants on the subject site and is to include details of the mature specimens. The maps must be presented in colour. The vegetation units mapped shall follow a standard classification, such as Walker and Hopkins (1990), and include dominant species in each vegetation unit.	Fig. 3.15	Mapped as indicated
A map of the locality, showing any locally significant areas for threatened species and ecological communities. This will include, but not be limited to, parks and reserves, wildlife connection corridors identified by DEC's Key Habitats and Corridors, SEPP Coastal Wetlands and Littoral Rainforests, and areas of high human activity such as townships, regional centres and major roads shall be provided.	Fig. 3.16 Fig. 3.11 Fig. 3.12	Corridor areas mapped in Figure 3.11-12 No clear mapping of parks and reserves SEPP 26 areas not mapped SEPP 14 areas illustrated in Figure 5.27 but not mapping with aerial photography overlay
Recent colour aerial photographs (less than 3 years old and at a scale comparable to the summary plan) of the locality (or colour reproduction of such a photograph) shall also be provided. If this is not possible, alternatives are to be discussed with the DEC. This aerial photograph is to clearly show the subject site and the scale of the photograph.	Fig. 3.13	Mapped as indicated
<u>2.3 Land tenure information</u> Information about the land tenure across the study area shall be provided. Any limitations to sampling across the study area (e.g., denied access to private land or difficult topography or vegetative access) shall be noted.	Surveys undertaken on subject site, the Belongil Estuary and the Tyagarah Nature Reserve. No limitations regarding access to study area	Limited information provided in Section 3.7.8

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
3. Initial assessment: identifying subject species, populations and ecological communities – Section 4		
A general description of the threatened species or populations known or likely to be present in the area that is the subject of the action and in any area that is likely to be affected by the action (Section 110 (2)(a)), and a general description of any endangered ecological communities present in the area that is the subject of the action and in any area that is likely to be affected by the action (Section 110 (3)(a)).	Table 4.1 S. 4.7.4	Table 4.1 only includes fauna species, does not contain all species listed in the DGRs and provides no indication of habitat requirements Threatened plant species first mention within Section 4.8 Vegetation survey results (Section 4.8.1) Endangered populations listed in DGRs not mentioned Endangered ecological communities (EECs) discussed in Section 4.7.4, but does not include all EECs listed in DGRs or Freshwater Wetlands Not all species/EECs for which 'particular attention is to be paid' (as noted in DGRs) have been considered. Some information on habitat for all species, populations and EEC list in DGRs provided in Table 5.1
The following list of subject species, populations and ecological communities is not necessarily exhaustive. The proponent must carry out their own process of determining the subject species, populations and ecological communities that may be utilising the study area, in particular the subject site, given the limitations of existing databases. This process should incorporate consideration of:	✓	No clear process followed. No evidence of relevant databases being considered even though DEC database mentioned in Section 4.2

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
the vegetation communities present within the study area;	4.8 Table 4.7	Descriptions of each vegetation community provided in Section 4.8 No discussion of condition of vegetation communities Freshwater wetlands not considered
the presence, quantity, quality and degree of existing and potential fragmentation of likely habitat for individual threatened species;	Table 4.7 No fragmentation anticipated due to the small development footprint and reforestation proposals	Table 4.7 only provides list of vegetation communities No discussion of existing or potential fragmentation of habitat
recent (within the last twenty years) records of threatened species, populations and ecological communities in the locality;	Tables 4.1 and 5.1 Sections 4.0 – Identification of subject species, populations & ecological communities 4.1 – Introduction 4.2 – Threatened species or populations known or likely to be present in the study area 4.3 – Previous flora and fauna surveys 4.7.3 Endangered Ecological Communities	Refers to a number of previous studies in Section 4.3 Table 4.1 shows records from a previous surveys/reports, but no reference to database records
records of threatened species, populations and ecological communities from the Byron Shire Threatened Species Database, Byron Bay Flora and Fauna study and from studies undertaken at Tyagarah Nature Reserve, Cape Byron State Recreation Area, Cape Byron Marine Park and Arakwal National Park.	Table 5.1 and Figs. 5.1-5.23 Appendix 2 – Flora Appendix 3 - Fauna	Reference the use of Byron Flora and Fauna Study, and Fire Management Plan for Tyagarah Nature Reserve No reference to the use and consideration of Byron Shire Threatened Species Database, and studies undertaken at Tyagarah Nature Reserve (other than fire management plan), Cape Byron State Recreation Area, Cape Byron Marine Park and Arakwal National Park.

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
the known range of threatened species, populations and ecological communities.	Table 4.1 and Table 5.1 where relevant 4.2 – Threatened species or populations known or likely to be present in the study area	Known range of species, populations and EEC not provided in Tables 4.1 or 5.1
Databases such as the Atlas of NSW Wildlife, and those of the Australian Museum and Royal Botanic Gardens are to be used to assist in compiling the list. To obtain information from the Atlas of NSW Wildlife, contact the Data Licensing Officer at DEC on 02 9585 6684. Note: these databases are representative of survey effort undertaken in an area and are not to be considered as comprehensive.	Reviewed for general Information	No evidence of databases having been review. Reference is made to DEC database in Section 4.2, but no mention is made in the SIS to the Australian Museum and/or Royal Botanic Gardens databases
The following species, populations and ecological communities shall be considered for inclusion in the list of subject species:	4.9 lists results 4.10 lists results	Table 5.1 only evidence of assessment of subject species Table based primarily on DGRs list, with a few addition species based on survey records
Threatened Species		
Flora:	Table 5.1	
* <i>Arthraxon hispidus</i>		
* <i>Acronychia littoralis</i>	Table 5.1	
* <i>Amorphospermum whitei</i>	Table 5.1	
* <i>Allocasuarina defungens</i>	Table 5.1	
* <i>Archidendron hendersonii</i>	Table 5.1	
* <i>Chamaesyce psammogeton</i>	Table 5.1	Discounted but potential habitat may occur in study area, requires further evaluation
* <i>Cryptocarya foetida</i>	Table 5.1	Considered as subject species
* <i>Diuris byronensis</i> (<i>Diuris</i> sp. aff. <i>chrysantha</i>)	Table 5.1	Discounted but potential habitat known to occur within the study area and should have been considered as subject species

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
<i>Drynaria rigidula</i>	Table 5.1	No considered in Table 5.1 or elsewhere in the report despite being listed in DGRs
<i>Hibbertia hexandra</i>	Table 5.1	Discounted but potential habitat known to occur within the study area and should have been considered as subject species
* <i>Geodorum densifolium</i>	Table 5.1	
* <i>Phaius australis</i>	Table 5.1	
* <i>Phaius tankervilleae</i>	Table 5.1	
* <i>Pultenaea maritima</i>	Table 5.1	
* <i>Pterostylis nigricans</i>	Table 5.1	
* <i>Syzygium moorei</i>	Table 5.1	Considered as subject species
<i>Xylosma terra-reginae</i>	Table 5.1	Discounted but potential habitat known to occur within the study area and should have been considered as subject species
Fauna: Frogs		Considered as subject species
* <i>Crinia tinnula</i> Wallum Froglet		
* <i>Litoria olongburensis</i> Wallum Sedge Frog		
* <i>Litoria aurea</i> Green and Golden Bell Frog	S4.10.1	No suitable habitat
Reptiles		Discounted but potential habitat known to occur within the study area and should have been considered as subject species
<i>Hoplocephalus stephensii</i> Stephens' Banded Snake	Table 5.1	
* <i>Hoplocephalus bitorquatus</i> Pale-headed Snake	Table 5.1	
* <i>Cacophis harriettae</i> White-crowned Snake	Table 5.1	
* <i>Coeranoscincus reticulatus</i> Three-toed Snake- tooth Skink	Table 5.1	
* <i>Chelonia mydas</i> Green Turtle	Table 5.1	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
* <i>Caretta careeta</i> Loggerhead Turtle	Table 5.1	Discounted but potential habitat known to occur within the study area and should have been considered as subject species
<i>Dermochelys coriacea</i> Leatherly Turtle	Table 5.1	
Birds		
* <i>Amauornis olivaceus</i> Bush Hen	Table 5.1	Considered as subject species
* <i>Grus rubicundus</i> Brolga	Table 5.1	
* <i>Burhinus grallarius</i> Bush Stone-curlew	Table 5.1	
* <i>Esacus neglectus</i> Beach Stone-curlew	Table 5.1	
* <i>Ixobrychus flavicollis</i> Black Bittern	Table 5.1	
* <i>Botaurus poiciloptilus</i> Australasian Bittern	Table 5.1	Discounted but potential habitat known to occur within the study area and should have been considered as subject species
* <i>Ephippiorhynchus asiaticus</i> Black-necked Stork	Table 5.1	Considered as subject species
* <i>Irediparra gallinacea</i> Comb-crested Jacana	Table 5.1	Discounted but potential habitat known to occur within the study area and should have been considered as subject species
* <i>Gygis alba</i> White Tern	Table 5.1	
* <i>Sterna fuscata</i> Sooty Tern	Table 5.1	
* <i>Sterna albifrons</i> Little Tern	Table 5.1	Considered as subject species
* <i>Procelsterna cerulea</i> Grey Ternlet	Table 5.1	Discounted but potential habitat known to occur within the study area and should have been considered as subject species
* <i>Peterodroma nigripennis</i> Black-winged Petrel	Table 5.1	
* <i>Phaeothon rubricauda</i> Red-tailed Tropicbird	Table 5.1	
* <i>Macronectes giganteus</i> Southern Giant Petrel	Table 5.1	
* <i>Puffinis carneipes</i> Flesh-footed Shearwater	Table 5.1	
* <i>Charadrius mongolus</i> Lesser Sand Plover	Table 5.1	Discounted but known habitat within the study area and should have been considered as subject species
* <i>Calidris tenuirostris</i> Great Knot	Table 5.1	
* <i>Limosa limosa</i> Black-tailed Godwit	Table 5.1	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
* <i>Anseranas semipalmata</i> Magpie-goose	Table 5.1	Discounted but potential habitat known to occur within the study area and should have been considered as subject species
* <i>Haematopus longirostris</i> Pied Oystercatcher	Table 5.1	Considered as subject species
* <i>Haematopus fuliginosus</i> Sooty Oystercatcher	Table 5.1	
<i>Stictonetta naevosa</i> Freckled Duck	Table 5.1	No suitable habitat
* <i>Ninox strenua</i> Powerful Owl	Table 5.1	Discounted but potential habitat known to occur within the study area and should have been considered as subject species
* <i>Ninox connivens</i> Barking Owl	Table 5.1	
* <i>Podargus ocellatus</i> Marbled Frogmouth	Table 5.1	
* <i>Tyto capensis</i> Grass Owl	Table 5.1	
* <i>Tyto novaehollandiae</i> Masked Owl	Table 5.1	
* <i>Tyto tenebricosa</i> Sooty Owl	Table 5.1	
* <i>Ptilinopus magnificus</i> Wompoo Fruit-dove	Table 5.1	
* <i>Ptilinopus regina</i> Rose-crowned Fruit-dove	Table 5.1	Considered as subject species
* <i>Ptilinopus superbus</i> Superb Fruit-dove	Table 5.1	Discounted but potential habitat known to occur within the study area and should have been considered as subject species
* <i>Lichenostomus fasciocularis</i> Mangrove Honeyeater	Table 5.1	
* <i>Calyptrorhynchus lathamii</i> Glossy-Black Cockatoo	Table 5.1	
* <i>Pandion haliaetus</i> Osprey	Table 5.1	Considered as subject species
* <i>Lophoictinia isura</i> Square-tailed Kite	Table 5.1	Discounted but potential habitat known to occur within the study area and should have been considered as subject species
* <i>Stagonopleura guttata</i> Diamond Firetail	Table 5.1	
* <i>Monarcha leucotis</i> White-eared Monarch	Table 5.1	
* <i>Todiramphus chloris</i> Collared Kingfisher	Table 5.1	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
<i>*Pomatostomus temporalis temporalis</i> Grey-crowned Babbler	Table 5.1	Discounted but potential habitat known to occur within the study area and should have been considered as subject species
Mammals		
<i>*Potorus tridactylus</i> Long-nosed Potoroo	Table 5.1	Considered as subject species
<i>*Planigale maculata</i> Common Planigale	Table 5.1	
<i>*Phascolarctos cinerius</i> Koala	Table 5.1	
<i>*Phascogale tapoatafa</i> Brush-tailed Phascogale	Table 5.1	Discounted but potential habitat known to occur within the study area and should have been considered as subject species
<i>*Petaurus norfolcensis</i> Squirrel Glider	Table 5.1	
<i>*Pseudomys gracilicaudatus</i> Eastern Chestnut Mouse	Table 5.1	
<i>*Syconycteris australis</i> Common Blossom-bat	Table 5.1	Considered as subject species
<i>Mormopterus beccari</i> Beccari's Freetail-bat	Table 5.1	Discounted but potential habitat known to occur within the study area and should have been considered as subject species
<i>Mormopterus norfolkensis</i> Eastern Freetail-bat	Table 5.1	
<i>Kerivoula papuensis</i> Golden-tipped Bat	Table 5.1	
<i>*Miniopterus schreibersii</i> Common Bent-wing Bat	Table 5.1	Considered as subject species (as Large Bent-wing Bat)
<i>*Miniopterus australis</i> Little Bentwing Bat	Table 5.1	Considered as subject species
<i>*Scoteanax rueppellii</i> Greater Broad-nosed Bat	Table 5.1	
<i>Chalinolobus nigrogriseus</i> Hoary Wattled Bat	Table 5.1	
<i>*Nyctophilus bifax</i> Eastern Long-eared Bat	Table 5.1	Considered as subject species (as Northern Long-eared Bat)
<i>Saccolaimus flaviventris</i> Yellow-bellied Sheath-tail bat	Table 5.1	Discounted but potential habitat known to occur within the study area and should have been considered as subject species
<i>*Myotis adversus</i> Large-footed Myotis	Table 5.1	Considered as subject species (as Fishing Bat)

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
* <i>Pteropus poliocephalus</i> Grey-headed Flying-fox	Table 5.1	Considered as subject species
<i>Pteropus alecto</i> Black Flying-fox	Table 5.1	
* <i>Arctocephalus pusillus</i> Australasian Fur Seal	Table 5.1	Suitable habitat in Cape Byron Marine Park
* <i>Dugong dugon</i> Dugong	Table 5.1	
* <i>Megaptera novaeangliae</i> Humpback Whale	Table 5.1	
Invertebrates		
* <i>Petaleura gigantea</i> Giant Dragonfly	Table 5.1	Discounted but potential habitat known to occur within the study area and should have been considered as subject species
* <i>Thersites mitchellae</i> Mitchell's Rainforest Snail	Table 5.1	
* <i>Argyreus hyperbius</i> Laced Fritillary Butterfly	Table 5.1	
including the larval food plant of the butterfly, <i>Viola betonicifolia</i>	Table 5.1	
Endangered Population		
<i>Dromaius novaehollandiae</i> Emu Population in the NSW North Coast Bioregion	Table 5.1	Agree with discounting this population
Endangered Ecological Communities		
Lowland Rainforest on Floodplain in the NSW North Coast Bioregion	Table 5.1	Agree with discounting this community
*Coastal Saltmarsh in the NSW North Coast Bioregion	Table 5.1	Considered as subject species
*Littoral Rainforest in the NSW North Coast Bioregion	Table 5.1	
River-flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast Bioregion	Table 5.1	Agree with discounting this community
*Subtropical Coastal Floodplain Forest of the NSW North Coast Bioregion	Table 5.1	Discounted but may occur within study area
*Swamp Oak Floodplain Forest of the NSW North Coast Bioregion	Table 5.1	Considered as subject species
*Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast Bioregion	Table 5.1	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
Particular attention is to be paid to the species, populations and ecological communities marked with an asterisked (*) and to the development of avoidance, amelioration and compensatory measures for them.		Of the 85 species/EECs marked with an asterisked (*) only 28 were considered to be subject species, despite a number of those discounted having habitat within the study area The selection of subject species in the SIS reflects more what is considered to be affected species, i.e. those that may potentially be impacted by the proposed development. Subject species are defined as those species/EECs known or considered likely to occur in the study area
Threatened species, populations and ecological communities on the above list may be excluded from further consideration as subject species only if a fully documented justification, robust to external examination, is provided. This documentation must address, as a minimum, the criteria for excluding any of the subject species that are listed above. In particular, the following reasons must not be used to exclude a threatened species: • that the species is cryptic or mobile or little surveyed for (e.g. bats), or some combination of the three, where the study area provides suitable habitat that falls within the species' range; • a lack of records in the locality; • that the species occurs in a range of habitats and its core habitat, or that all components of their habitat is not present in the study area or locality; • that the species is wide-ranging and occupies a large home range; nor • that the habitat for that species occurs on the adjacent or nearby land.	Table 5.1	Detail for exclusion is not fully documented i.e. usually only one sentence provided, neither is it robust. In many cases the same argument is basically used to exclude a species as include a species, with the sole differentiator being whether the species or community has been recently recorded within the subject site. Consideration should have been broader to include all species which have previously been recorded (or their habitat is known to occur) within the study area (i.e. considering an area greater than the development area (subject site)) The assessment within the SIS is focused around what would be considered to be the subject site rather than the study area

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
This level of assessment allows the DEC, where a species, population or ecological community has been excluded from further consideration, to make informed decisions about whether additional information is required (e.g. about a species) or whether additional mitigation measures should be proposed for a species by the applicant.	General information	
Consideration must also be given to whether any threatened species, populations and ecological communities listed on the TSC Act between the date of these DGRs and the submission of the development application are also relevant.	Literature review	No evidence that this has been undertaken Two threatened species were listed between July 05 and Jan 06 which would have potential habitat within the study area and should have been considered further: Delicate Mouse and Red-backed Button-quail
4. Survey and habitat mapping		
4.1 Requirement to survey It would be to the proponent's advantage to discuss any proposed variation to the methodology for the SIS from the methods in Appendix 1, prior to undertaking the surveys for the SIS, to determine whether the DEC considers that it is appropriate and will comply with the Director-General's requirements.	Liaison sought and DGRs amended	Revised DGRs provided (July 05) based on changes to the development
A fauna and flora survey must be conducted in the study area. Targeted surveys shall be conducted for all subject species determined in accordance with Section 3 above. Previous surveys and assessments (less than 5 years old) may be used to assist in addressing this requirement. Previous survey work undertaken outside the appropriate season for detecting the target species or in unsuitable habitat must not be used to contribute to the total survey effort for a species. However, surveys undertaken greater than five years ago may be used to contribute to understanding the site and in designing the surveys.	Section 4 Section 4.4 – Fauna Survey methods Section 4.7 – Vegetation Survey Only <5 yr old surveys relied upon – others for completeness only	Surveys limited to the subject site. While none of the plants species considered to be subject species in the SIS required targeted surveys, other plants species which should have been considered subject species (see above) would require targeted surveys in the correct season

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
Surveys are to be undertaken by appropriately experienced and licensed persons. A recognised authority, such as the Australian Museum or National Herbarium at the Royal Botanic Gardens, Sydney shall confirm species of taxonomic uncertainty. Details of the surveyors experience and licenses held are to be provided in Sections 9.1-9.3 of the SIS as per the requirements in these sections of the DGRs.	Section 9	It is highly questionable that one person (i.e. Peter Parker) has sufficient knowledge to undertake all aspects of the SIS with only one field assistance. While Section 9.1 states that relevant licences were held by Peter Parker and Eli Dutten, no details of the licences are provided. No CV provided for Eli Dutten in Appendix 4
As a minimum, survey methods for subject species and ecological communities must follow those detailed in Appendix 1, unless justification for variation from these methods can be provided to the satisfaction of the DEC prior to the surveys taking place. Surveys must be undertaken in various areas identified as likely and potential habitats (macro and micro-habitat), at the time of year when the subject species are most likely to be detected and, where relevant, in appropriate weather conditions.	Table 4.2 illustrates how survey effort exceeds DGRs Section 4.4 – Fauna survey methods states that methods reflect the DGRs requirements	As mentioned previously (Sections 4.1, 5.1 and 5.2 of this report) while the methodology and survey effort for plants and animals appears to be appropriate, further details is required to determine if they were sufficient.
The minimum survey effort, as defined in Appendix 1, is designed to detect threatened species and identify ecological communities at the optimal time (including the time of day and time of year) and in optimal conditions. It is the responsibility of the applicant to determine appropriate areas for the surveys in the study area and to ensure that the surveys were undertaken in conditions suitable to detect the species. Where it is determined that surveys have not been undertaken in optimal conditions to detect the target species, appropriate additional survey is to be undertaken. Further survey may also be required to adequately cover the areas of suitable or potential habitat for a particular subject species on the subject site and in the study area. When designing the survey, consideration is to be given to the various environmental and landscape type constraints to the survey in order to maximise opportunities to detect the species on the subject site and in the study area.	Survey effort significantly exceeds that listed in the DGRs. Discussion supplied as to efficacy of methods	Surveys designed to target species that Peter Parker considers to be affected rather than all subject species and communities (i.e. those known to or with the potential to occur). Minimum survey effort for EEC is at least one quadrat per community. No quadrat surveys were undertaken. While none of the plants species considered to be subject species in the

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
Once a species is detected, or ecological community is identified, on the subject site or in the study area further survey effort is likely to be required to understand the distribution of the threatened species and ecological community within the subject site. The use patterns of the species (nesting, foraging, roosting, breeding etc) and its habitat on the subject site are to be determined. This information is also to be provided as maps, as required in Section 4.4 of these DGRs.	Fig. 4.2 Fig. 4.3 Use patterns and locations of subject species mapped in Figs. 5.1-5.24	SIS required targeted surveys, other plants species which should have been considered subject species (see above) would require targeted surveys in the correct season Figure 4.1 indicates the location of the fauna surveys, but there is no similar figure for the plant surveys. Records of threatened species recorded during the surveys are provided in Figures 4.2-3. Figures 5.1-5.24 show areas of potential habitat only (and not always correctly, see Section 5.3.2.3 of this report). Areas of suitable habitat are not mapped
4.2 Documentation of survey effort and technique The information required in this section assists the DEC to determine whether sufficient survey effort has been undertaken to exclude certain species or ecological communities from further assessment and to ensure appropriate ameliorative measures are developed.	Table 4.2 illustrates compliance	Surveys conducted prior to DGRs being issued See comments above, plus Sections 4.1, 5.1 and 5.2 of this report, re surveys effort and suitability

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
<u>4.2.1 Description of survey techniques and survey sites</u> Survey techniques must be described, outlining the survey technique employed. Specific subject species targeted by each survey technique must be listed. A description of the habitat in which the survey was undertaken is to be provided. This includes the micro- and macro-habitat characteristics. A reference must be given for surveys undertaken previously that are used to contribute to the survey effort for this SIS.	4.5 4.6 4.7 4.8	Sections 4.5 and 4.6 provide information on weather during the fauna surveys and survey limitations Information on survey techniques is provide Section 4.4 for fauna and 4.7 for flora. Specific subject species targeted by each technique is not provided with the methods but instead is located in Table 4.2 Description of micro and macro habitat features in which the surveys were undertaken is not provided
Survey sites must be identified on a clearly keyed map, at the same scale as relevant maps referred to in Section 2.2. The size, orientation and dimensions of quadrat or length of transect/meanders should be clearly noted for each type of survey technique undertaken. Full AMG references for the survey sites must be noted. The SIS must include a table showing compliance or otherwise with the survey methods outlined in Section 4.1 and Appendix 1. Symbols used to denote types of survey sites and techniques, or locations of threatened species records should be clearly distinguishable from each other and from any background information, e.g., vegetation type.	Fig. 4.1 Table 4.2	Figure 4.1 show survey sites for fauna species No map of flora survey sites provided Table 4.2 shows compliance with DGRs survey requirements
<u>4.2.2 Documenting survey effort</u> The time taken to complete each survey must be provided in the SIS. For example, number of person hours per transect/meander, duration of call playback, number of nights on which traps were set. It is not sufficient to aggregate all time spent on all survey techniques. Effort must be expressed for each separate survey technique and each vegetation community/habitat for each subject species and ecological community. The SIS must include a table showing compliance or otherwise with the survey effort outlined in Section 4.1 and Appendix 1. This should include reference to correspondence with the DEC and agreement by the DEC to vary methodology.	Table 4.2	Table 4.2 provides information on the methods (including survey effort) to be used it does not clearly provide total effort required to complete each survey. In addition, survey effort is not separated by vegetation/habitat type.

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
Environmental conditions must be recorded at the beginning of each survey technique and any variation during the survey should be noted.	Tables 4.3 and 4.4	Environmental condition are not recorded at the beginning of each survey, but instead as separate tables (Tables 4.3 -4) in Section 4.5 Weather
The micro- and macro-habitat features targeted during the survey must be identified. The effort undertaken in each is to be provided. For each subject species targeted, the area covered by the survey technique is to be correlated to the amount of, and proportion of, suitable and potential habitat in the study area and on the subject site.	Sections 4.4 to 4.7	Correlations between the area surveyed and the amount/proportion of suitable and potential habitat for each species not provided Micro and macro habitat features targeted in each survey are not identified
Personnel details including name of surveyors and contact phone numbers must be provided. The names and contact details of the person who identified or confirmed any species not definitively identified by the survey personnel, or both, (e.g., Anabat, hair tubes, scat analysis and plant specimens) must also be provided.	Section 9 & 9.1 also curriculum vitae supplied in Volume 2	Details of surveyors provided in Section 9. Phone numbers/contact details not provided
<u>4.3 Survey results</u> <u>4.3.1 Subject species survey results</u> All occurrences of subject species identified in the study area must be recorded (including AMG references), together with the vegetation community, and micro and macro-habitat details, in which they were located. Information on all records of threatened species made during the surveys must be provided in an Appendix to the SIS. This information is to be provided in a tabular form.	4.9 4.10 Appendix 2	Appendix 2 provides details of threatened fauna species recorded, record type and AMG reference. Information on vegetation communities in which the species were recorded was not provided in the table, although broad vegetation/habitat types were. AMG references not provided for records of threatened flora species
This information must also be provided separately to the DEC on Atlas of NSW Wildlife data recording cards or sheets, or electronically in a format acceptable to the DEC. All data fields listed on these cards and sheets must be completed.	Provided separately	Not known if this was provided

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
Factors that may have limited the success of the individual survey techniques employed or surveys in general (for example, sampling intensity and locations, detectability of species, ground visibility, influence of season and weather conditions, denial of access) must be identified and discussed with respect to the results of the survey for each subject species. Any subject species not detected by the SIS or previous surveys or both, but which, by virtue of the presence of suitable habitat, have the potential to occur in the study area and subject site, must be identified. This assessment must be robust to external evaluation.	Survey undertaken over an extended period of time and utilised results from previous surveys (e.g. AM 1995). No limitations on survey efficacy	Survey limitations provided in Section 4.6
<u>4.3.2 General species survey results</u> A list of all the protected fauna and native plant species found during surveys must be provided. This list is to also include exotic species and they are to be differentiated from natives species by the use of an asterisk (*). The vegetation community/ies in which each species was recorded must be provided. The information must be utilised to identify and discuss the biodiversity and habitat quality of each vegetation community.	Volume 3: Appendix 2 & Appendix 3	Provided as indicated
<u>4.3.3 Ecological community survey results</u> The relevant information gathered using required survey effort (Appendix 1) and the data presented in Section 4.3.2 are to be extrapolated and provided for any endangered ecological community in the study area and on the subject site.	Endangered Ecological Communities mapped in Figs. 5.21-5.24. These communities will not be affected by the proposal, thus additional survey effort not required	EECs only mapped for the subject site and not for the entire study area Description of EECs limited (as described in Section of 5.3.1.2 this report)

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
<u>4.4 Subject species, populations and ecological community habitat mapping</u> Discrete areas identified as known or potential habitat on the subject site and in the study area are to be depicted for each of the subject species and ecological communities. This includes the identification of potential and suitable habitat for those subject species not recorded on the subject site or in the study area during the surveys. These maps are to be at the same scale as summary plan and vegetation maps and are to include any point locality records of the relevant subject species and ecological communities on the subject site and in the study area (including previous records such as Atlas of NSW Wildlife records and records from the SIS survey).	Figs. 5.1-5.23	Figures 5.1-23 only show areas of potential habitat within the subject site. Areas of suitable habitat have not been mapped, nor has mapping been provided that considers the entire study area as defined in Section 3.8 of the SIS Maps only provided for threatened species which have been recorded within the subject site. Threatened species which have not been recorded within the subject site have not been considered subject species even if potential habitat was present
Quantification of the proposed habitat loss is required to adequately assess the significance of habitat loss associated with the proposal. In undertaking this assessment, at a minimum, the extent of threatened species and ecological community habitat in the study area is to be estimated using the best available information and expert opinion.	N/A as no habitat lost or impacted	No quantification of habitat losses provided, even though some species prefer open, lightly timbered or grassland areas e.g. Bush Stone-curlew . Such areas will decrease as a result of the proposed development
Information that can be used to prepare these maps includes: records of threatened species and ecological communities in the local area, maps of the vegetation communities and broad habitat types in the study area, information on the habitat requirements of threatened species and ecological communities and site specific knowledge gained through field survey and inspection during the preparation of the SIS.	N/A as no habitat lost or impacted	No mapping of habitats/vegetation communities outside of the subject site is provided
At a minimum, colour and computer generated maps of potential and suitable habitat and an assessment of the proportion of the habitat to be affected should be provided for each of the subject species identified in Section 5.1 of the SIS. Where relevant, potential and suitable habitat is to be mapped according to its use by the particular subject species, e.g. as foraging, roosting, nesting or other habitat.	N/A as no habitat lost or impacted	No information on the habitat requirements of threatened species is provided Potential and suitable habitat not mapped according to its use by threatened fauna species

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
5. Assessment of likely impacts on threatened species and populations		
<i>A full assessment of the likely effect of the action on those species and populations, including, if possible, the quantitative effect of local populations in the cumulative effect in the region (Section 110(2)(g)).</i>	Section 5	Assessment of impacts is limited as it is considered by the author that the proposed development will have no impacts on any threatened species or EEC as areas of the subject site will be revegetated. See Sections 5.4 and 5.5 of this report for further discussion
This section is to be addressed for those threatened species that are likely to be affected by the proposal, including effects of cumulative impacts.	Section 4	List of species likely to be affected by the proposed development determined prior to this section without fully considering the impacts of the proposed development
Assessment must consider indirect as well as direct impacts. It must also incorporate the likely and potential impacts of associated activities on the subject site and in the study area. These impacts may include, but are not restricted to:	Section 5	Not all impacts considered or assessed.
vegetation clearance on habitat fragmentation, edge effects, vegetation corridors;	N/A as no habitat lost or impacted Section 4.10.3 – Threatened species habitat and wildlife corridors Volume 3 – Management Plans	Habitat loss and fragmentation will occur for those species that frequent open, lightly wooded or grassland areas The removal of trees within the development area will also remove habitat for birds and arboreal mammals Edge effects will also occur
installation and maintenance of buildings and utilities, in particular sewerage and water pipelines, powerlines, fences, walking tracks and other infrastructure;	5.1 5.2 5.3	Sections 5.1 and 5.2 outline proposed works for services and infrastructure for the site. While there is limited discussion of measures that will be undertaken to minimise impacts, there is no discussion of potential/actual impacts Potential impacts will occur during and post construction

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
fire management, including construction and maintenance of asset protection zones;	Figs. 5.39 and S. 3.7.1	Potential impacts will occur during and post construction (associated within ongoing use of areas) See also Section 5.6.1.1 of this report
construction and utilisation of access and transport routes;	5.1.5	Section 5.1.5 Transport routes outlines proposed works for access and transport routes for the site. While there is limited discussion of measures that will be undertaken to minimise impacts, there is no discussion of potential/actual impacts Potential impacts will occur during and post construction Most of Section 5.1.5 is actually about changes to the drainage of the subject site
increased visitation pressure on headland vegetation and adjacent reserves;	No increased visitation and therefore not relevant as site is some 8 km from Cape Byron Headland	SIS (and SEE) argues that there will be no increase in numbers of people (and associated impacts such as dogs, noise, road traffic) to the subject site as the number of sewerage ETs allocated to the site is the same for the proposed development as for the existing. However this argument does not take into account the fact that the existing development only uses approximately 30-50% of the sewerage entitlements (P. Parker <i>pers. comm.</i>) compared to the proposed development which will use all of the entitlements. Based on this, the proposed development would potentially increase by 2-3 times the number of humans using the site and associated impacts.
changes to noise levels and types of noise;	No changes expected as existing resort of similar scale currently occupies site	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
changes to lighting;	5.2.5	Brief discussion on lighting provided in Section 5.2.5. Only impacts/mitigation measures considered are that the street lights are design in harmony with the site design and that they do not attract insects. Impacts of lighting on native fauna are not considered.
increase in numbers of people, domestic pets and road traffic;	No changes expected as existing resort of similar scale currently occupies site. Dogs are prohibited	SIS (and SEE) argues that there will be no increase in numbers of people (and associated impacts such as dogs, noise, road traffic) to the subject site as the number of sewerage ETs allocated to the site is the same for the proposed development as for the existing (see Section 3.1.5 of SIS). However this argument does not take into account the fact that the existing development only uses approximately 30-50% of the sewerage entitlements (P. Parker <i>pers. comm.</i>) compared to the proposed development which will use all of the entitlements. Based on this, the proposed development would potentially increase by 2-3 times the number of humans using the site and associated impacts.
potential for collisions of threatened birds and bats with the proposed wind turbine;	Wind turbine not part of proposal	As indicated

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
changes in surface and sub-surface water flows;	5.1.5 5.2.4	Changes in drainage for the site are discussed under Section 5.1.5 Transport routes, which does not seem appropriate. Impacts on changes to drainage on SEPP 14 wetlands not considered Impacts associated with acid sulphate soils not fully considered
Frontal dune works;	Dune Management Plan Volume 3	Impacts on dune systems from increase numbers of people, rubbish and beach access causing erosion
changes to the environment, including investigating changes to pH of surface and groundwater, potential for chlorine residues, nutrients, pollutants, pathogens etc as a result of fill and effluent irrigation proposals;	No effluent irrigation proposed Section 5.1.5 – Transport routes Section 5.1.6 – Sediment and erosion control Section 5.2.4 Groundwater Volume 3: water management	Changes in water quality not fully considered in proposal
changes to drains	Volume 3 waterbodies, S.3.3 and plan set	Impacts from changes to the site drainage on waterbodies and SEPP 14 wetlands not considered
changes to water quality, including stormwater run off and pollution. These actions or impacts may occur on or off the subject site.	Volume 3, water cycle Section 5.1.5 – Transport routes	Changes in water quality not fully considered in proposal
Fire Management In addressing the impacts to threatened species as a result of the fire management required on the site, the following matters are to be considered and the required information provided:	5.5	Not all requirements are adequately discussed in the SIS
The Planning for Bushfire Protection guidelines state that the APZ distances are to be measured horizontally and not along the slope of the land. The APZ is to be measured from the extremities of the building construction area (to be delineated on a map). Provide confirmation in the SIS that the on-ground measurements satisfy these provisions.	5.5	Provided in 5.5

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
The proposed Asset Protection Zone (APZ) including the Inner Protection Area (IPA) and Outer Protection Area (OPA) are to be mapped, providing the extent of the dimensions, as a minimum, at each of the following directions N, S, E, W, SW, SE, NE, NW. The map is to be of a scale that can be overlapped with the vegetation map and the threatened species records and habitat maps.	Fig. 5.39	APZ Mapping provided in Figure 5.39 but not overlapped with vegetation and threatened species mapping
Section 4.2 of the Planning for Bushfire Protection guidelines provide details of the components of an APZ. The IPA is measured from the edge of the OPA to the development edge. In Section 4.2.2 b of the guidelines, in the IPA fuels are required to be minimised and are determined on a performance basis rather than a minimum fuel load. Provide details of whether, and the way, the performance of the fuel loadings in the IPA will:	5.5	Fuel management within the IPA discussed under Section 5.5
achieve minimum fuel at ground level that could be set alight by fire,	5.5	Discussed under Section 5.5
avoid having any vegetation in the IPA that provides a path for the transfer of fire to the development,	5.5	Discussed under Section 5.5
avoid shrubs and trees overhanging or touching buildings and they must not form a continuous canopy,	5.5	Not discussed under Section 5.5
ensure shrubs and trees are not of a species that retains dead material or deposit excessive quantities of ground fuel in a short period or a danger period, and	5.5	Discussed under Section 5.5
ensure shrubs and trees are located far enough away from the house that they will not ignite the buildings by direct flame contact or radiant heat emissions.	5.5	Not discussed under Section 5.5
In Section 4.2.2.a of the Planning for Bushfire Protection guidelines, the OPA is required to be located adjacent to the hazard, to have fuel loadings reduced that will decrease the intensity of approaching fire and reduce the level of direct flame, radiant heat and ember attack to the IPA. In the OPA, shrubs and trees are not to be continuous and a fine fuel loading of less than 8 tonnes per hectare is required. The OPA is usually 10m, however for special protection developments a 15m OPA is likely to be required. Provide details of whether, and the way, the performance of the OPA, as described above, will be met	5.5 – Fire management	OPA in development treated as for IPA Discussed under Section 5.5.2
The Planning for Bushfire Protection guidelines suggest that the APZ should not be located on land steeper than 18 degrees and that slope is to be recorded from the building line where there is variation on the site. Relevant information about the site's slope is to be provided. Where there is slope variation on the site, additional detail of this variation on the subject site and adjacent land is also to be provided.	5.5	Under Section 5.5.2, SIS states that 'no slopes are greater than 180°' Information of slope provided in Table 5.2

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
The Planning for Bushfire Protection guidelines require all APZ to be fully contained within the property boundaries. Confirm that the proposed APZ will occur within the property boundary. If any areas fall outside the property boundary, written permission must be obtained from the landholder for this land to be used in perpetuity for that purpose. A fire plan for those lands are to be provided	All APZs are located within site boundaries	Discussed under Section 5.5.2 as indicated
Confirm the tables and vegetation type(s) in the Planning for Bushfire Protection guidelines that were used to determine the appropriate APZ requirements for the proposal	Table 5. 2	Some information provide in Table 5.2, but no text with table to explain the contents
Identify the type of management that is proposed in the APZ and the proportion of land to be affected by the action. For example, whether slashing, trimming, thinning or clearing or a combination of these is proposed, and whether hand or mechanical methods are proposed. Provide details of the timing, season and frequency that the proposed action is to be undertaken	5.5 3.7.1	Brief discussion provided in Section 5.5, but further detail should be provide on how, when, season and frequency of proposed actions Section 3.7.1 Globetrotters discusses previous and current uses of the site. No discussion of APZ management is provided in this section
Provide a copy of the relevant part of the Rural Fire Service's bush fire prone land map for the study area	Table 5.2: LES Map in section 5.5.	May be provided under Table 5.2 on pg 2.5 but no figure caption or text to explain figure
Address the long term vegetation management for any vegetation retained on the site, including regard to the vegetation requiring fire management as part of its maintenance and long term persistence on the site and in adjacent areas. Planned fires in these areas may be constrained, in season and intensity and may be subject to greater or lesser frequency than recommended for the vegetation type. Therefore, opportunities for management burns for conservation purposes are likely to be compromised	Volume 3	Vegetation management discussed in Volume 3 is very brief. A detail Vegetation Management Plan should be prepared See Section 5.6.1.2 of this report for further detail
The Bushfire Environmental Assessment Code, and	5.5	
Any additional requirements of the Rural Fire Services. Details of your consideration to these requirements are to be included	5.5	Under Section 5.5.4 the SIS states that the 'code does not apply to APZs for new developments'. Also states that protection measures are in accordance with guidelines
If fire protection measures proposed are less than that expected in the Planning for Bushfire Guidelines, a letter must be attached from the Rural Fire Service stating that they approve of the proposed measures	Fire protection measures comply	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
5.1 Assessment of affected species An assessment of which threatened species or populations known or likely to be present in the area are likely to be affected by the action (Section 110(2)(b))	5.4	Inadequate assessment/identification of threatened species/populations known of likely to be present in the study area as discussed above and in Section 5.3 of this report
Each subject species must be assessed to identify those threatened species likely to be affected by the proposal, and to identify the nature, extent and degree of the impacts to those species or populations. The assessment process must incorporate survey results, habitat mapping, identification and analysis of likely impacts, and any other relevant information	Table 5.1	Inadequate assessment of subject species provided to identify those species likely to be affected i.e. affected species
An “affected” species is not necessarily a species that is determined to be significantly impacted upon by the proposal. In determining which threatened species or their habitats are likely to be affected by the proposal, no consideration is to be given to the proposed ameliorative or compensatory measures. Therefore, a threatened species that is likely to be impacted upon to any degree, may still be affected by the proposal and must be considered further in this and following sections of the SIS	No threatened species considered to be affected due to protection and preservation of all suitable habitat, extensive buffers, alternative beach accessways, and extensive restoration work	Assessment process does not incorporate all the information outlined in the DGRs as required See Sections 5.3 to 5.5 of this report for further information
The potential for conflict between measures to protect threatened species and their habitats and the measures required to provide adequate fire protection to the proposed structures of the development must be addressed. The Planning for Bushfire Protection guidelines (2001) and the Rural Fires and Environmental Assessment Amendment Act 2002 and “AS3959 Construction of Buildings in Bushfire Prone areas” must be used in determining impacts and affected species in relation to fire management and asset protection	No potential for conflict, see Fig. 5.3	See Section 5.6.1.1 of this report for discussion conflict between buffer zones and APZ for the site No discussion of bushfire guidelines and acts when determining impacts and affected species

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
The number of hectares and proportion of each vegetation community and the habitat features in the study area that will be removed or affected by the proposed action must be provided. Loss of foraging territory and cumulative impacts of loss of habitat are to be considered in determining affected species	No significant habitat or part of any mapped vegetation association will be removed or disturbed. Figs. 3.10, 4.2, 4.3, 5.25 – 5.38, 7.1	Habitat loss and fragmentation will occur for species that frequent open, lightly wooded or grassland areas The removal of trees within the development area will also remove habitat for birds and arboreal mammals Edge effects will also occur No details are provided in the SIS regarding the amount and proportion of vegetation/habitat that will be affected
The reasons for the exclusion of any subject species or populations from being an affected species must be justified. The remaining requirements in Section 5 must be addressed for those species or populations determined as being affected by the proposal. This information is required to assist the DEC in assessing the consideration given to affected species and whether adequate mitigating measures are proposed	Table 5.1, Fig. 3.10 Section 5.4 – No species considered affected by proposal. Therefore remaining requirements in Section 5 do not require to be undertaken	Species considered to be subject species in the SIS should actually be (at a minimum) considered affected species. Other species or populations may also required consideration as affected species Insufficient reason provided in the SIS for the exclusion of all 'subject species' from being affected species
5.2 Discussion of conservation status For each species or population likely to be affected, details of its local, regional and State-wide conservation status, the key threatening processes generally affecting it, its habitat requirements and any recovery plan or threat abatement plan applying to it. (Section 110(2)(c)). The information provided in this section should include identification and discussion of	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	Not addressed in the SIS as it is considered that there are no affected species
the likely impacts of the proposal and relevant key threatening processes on each affected subject species' conservation status, particularly at the local scale;	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	After appropriate consideration of both subject and affected species, this should be addressed to meet the DGRs requirements

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
whether the likely impacts of the proposal may increase or decrease the impacts of relevant key threatening processes on each affected subject species' local conservation status; and	No species considered affected by proposal. Therefore remaining requirements in Section 5 do not require to be undertaken	Not addressed in the SIS as it is considered that there are no affected species After appropriate consideration of both subject and affected species, this should be addressed to meet the DGRs requirements
the information provided in relevant recovery plans, and how including relevant recovery actions in the development proposal, may contribute to reducing the impacts of the proposal.	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	
In addition, assessment should include reference to the threatening processes that are generally accepted by the scientific community as affecting the species or population and are likely to be caused or exacerbated by the proposal.	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	
Assessment should also include reference to any approved or publicly exhibited draft recovery or threat abatement plans which may be relevant to the proposal. Details of these plans can be found on the DEC website.	Reviewed (e.g., red fox) in Volume 3	
<u>5.3 Discussion of local and regional abundance</u> An estimate for the local and regional abundance of those species or populations (Section 110 (2)(d))	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	
<u>5.3.1 Discussion of other known local populations</u> Identification and discussion of all known populations of each affected threatened species in the locality must be provided. This information must include (unless stated that it is not available):	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	
the population size using either relative or absolute measures of abundance and the extent in hectares of each population;	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	
their locations, relative to each other, and depicted on a map	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
the age and sex structure of each population	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	Not addressed in the SIS as it is considered that there are no affected species
an assessment of the conservation significance of populations in the study area, including an assessment of the significance of the population in the study area in the context of the species' occurrence in the locality	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	
an indication of the degree to which the size and structure of the population each species would be affected by the likely impacts of the proposal	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	
Where it is stated that the information required is not available, details must be provided to demonstrate that this information was sought and, if relevant, the limitations to the assessment due to the lack of information have been considered	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	
<u>5.3.2 Discussion of habitat utilisation</u> An assessment of how threatened fauna utilise the habitat available on the study site is to be provided in the SIS. This assessment will consider the types or classes of habitat present, the purpose for which they are used by threatened species, measures of abundance of each species within the different classes of habitat. The significance of the habitat on the study site should be placed in both a local and regional context	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	After appropriate consideration of both subject and affected species, this should be addressed to meet the DGRs requirements
An assessment of threatened flora habitat available on the study site is to be provided in the SIS. This assessment will include identification of different classes of habitat present, assessment of the size and structure (age classes such as seedling, juvenile, adult, senescent) of the population in each of the habitat types, the area of occupancy, the area of potential habitat and an assessment of the potential for regeneration from the seedbank. The significance of the habitat on the study site should be placed in both a local and regional context.	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	
A discussion of the significance of the habitat on the subject site and study area to the viability of the threatened species in the locality is to be provided	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
5.3.3 Discussion of regional abundance Information and a discussion of the regional abundance of each affected threatened species must be provided. This must include (unless stated that it is not available)	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	Not addressed in the SIS as it is considered that there are no affected species After appropriate consideration of both subject and affected species, this should be addressed to meet the DGRs requirements
measures of abundance (in order of preference: quantitative, semi-quantitative or qualitative)	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	
the distribution pattern of the abundance	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	
a determination of the conservation significance of the study area with respect to regional abundance	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	
If the locality is of particular value from a regional perspective this shall be noted and discussed. If the locality is not considered of particular value from a regional perspective this shall be noted and discussed	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	
Where it is stated that the information required is not available, details must be provided to demonstrate that this information was sought and, if relevant, the limitations to the assessment due to the lack of information have been considered	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	
5.4 Assessment of habitat <i>A full description of the type, location, size and condition of the habitat (including critical habitat) of those species and populations and details of the distribution and condition of similar habitats in the region (Section 110 (2)(f))</i>	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	
In undertaking the assessment for this section the draft Byron Biodiversity Conservation Strategy (2003) and the Byron Bay Flora and Fauna Study are to be considered	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
5.4.1 Description of habitat values The value of the subject site and study area for the various lifecycle stages of the affected species shall be identified and discussed. This is to include discussion of specific areas and resources within the subject site and in the study area utilised, or potentially utilised, by subject species for specific habitat requirements e.g. breeding, roosting, feeding, foraging. This information is also to be presented in a tabular format	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	
Specific habitat features identified on the subject site shall be described and provided on a map for the species, features such as the stags, hollow bearing trees, culverts, rockshelters, rock outcrops, winter-flowering Eucalypts and Banksia trees, crevices, caves, ephemeral or isolated waterbodies, drainage lines, soaks, disused mine sites, quarries and pits, bridges, tunnels and any other habitat features). This is to include details of the location, frequency and evidence of use of the habitat features identified during the field surveys	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	
An assessment of the density of understorey vegetation and groundcover is to be provided. In addition, the location (mapped) and dimensions (in table form) of tree hollows on the subject site are to be provided. Details of hollows are to be described in general terms and the threatened species that may use them listed	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	
The condition of the habitat on the subject site shall be discussed, including: • weed assessment - the prevalence of introduced species, species of weeds present and an estimate of the total weed cover as a percentage of each vegetation community	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	
• disturbance assessment - whether trampling or grazing is apparent, effects of erosion, prevalence of rubbish dumping, history of resource extraction or logging and proximity to roads; and	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	
• resilience assessment - the potential for regeneration from either the soil seed bank in those disturbed areas or the likelihood of recolonisation from adjacent vegetation.	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	
Details of the subject site's fire history (e.g. frequency, time since last fire, intensity) and the source of fire history (e.g. observation, local records) shall be provided	3.7.8	Provided as described

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
5.4.2 Extent of habitat removal The location, nature and extent of habitat removal, or modification, or both, that is known or likely to result from the proposal must be identified and discussed for each affected threatened species. This assessment is to include the likely cumulative loss of habitat (using vegetation communities as a surrogate) within the locality. It is to be based on areas identified for development (using Zones 2(a), 2(t), 2(v), 3(a), 4(a) in the current Byron Shire LEP 1988)	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	
The amount of vegetation to be removed and to be modified on the subject site must be quantified (in terms of area) and include all facets of the development (buildings and structures, roads, carparks, recreational areas, activities the development will provide for, fire management, sewerage pipelines and other infrastructure) and qualified (in terms of use). The maps referred to in section 4.4 must be used	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	
The likely impacts of this habitat removal or modification on the future viability of populations of each affected threatened species in the subject site and the study area must be identified and discussed	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	Not addressed in the SIS as it is considered that there are no affected species
5.4.3 Consideration of corridors Areas within the study area and subject site which may act as local or regional corridors (or part thereof) for affected species must be identified and described. This is to include consideration of the value of the subject site as part of a corridor for threatened species, including any relevant key habitat corridors identified by the DEC. A map showing identified corridors must be provided. The impact of the proposal on these areas shall be discussed in relation to the threatened species or population likely to use the corridor and the expected purpose of the use e.g. foraging, roosting, nesting etc. This is to include particular consideration to the following potential corridor links: • from Tyagarah Nature Reserve to mouth of Belongil estuary	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	After appropriate consideration of both subject and affected species, this should be addressed to meet the DGRs requirements
• from Tyagarah Nature Reserve through the Sewerage Treatment Works to Cumbebin Swamp; and	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
• from this potential link to wetlands around Belongil	No species considered affected by proposal. Requirements in Section 5 do not require to be undertaken	Not addressed in the SIS as it is considered that there are no affected species After appropriate consideration of both subject and affected species, this should be addressed to meet the DGRs requirements
6. Assessment of likely impacts on endangered ecological communities – Section 6		
A full assessment of the likely effect of the action on the ecological community, including, if possible, the quantitative effect of local populations in the cumulative effect in the region (Section 110(3)(d))	Endangered Ecological Communities mapped in Figs. 5.2-5.23. Proposal will have no effect on any of the Endangered Ecological Communities at the site	Not all EECs potential present within the subject area are considered within the SIS (see Section 5.3.1.2 of this report for further detail). Considered in the SIS that the presence of buffers will ensure that there will be no impacts on EEC within the study area. However impacts will still potential occur and should be considered further in the SIS (See Sections 5.4.1 and 5.5.1)
6.1 Assessment of endangered ecological communities likely to be affected Given the outcome of survey and habitat mapping and analysis of likely impacts, an assessment is to be made as to whether any endangered ecological communities will remain affected by the proposal. Reasons for exclusion of any endangered ecological communities must be justified. The remaining requirements in this section must be addressed for any endangered ecological communities still affected by the proposal	Not required as proposal will not impact on Endangered Ecological Communities	Not addressed in the SIS as it is considered that there are no impacts on EEC
Assessment must consider indirect as well as direct impacts. These actions or impacts may occur on or off the subject site. It must also incorporate the impacts of associated activities, including, but is not restricted to: • vegetation clearance on habitat fragmentation, edge effects, vegetation corridors, lifecycle of species occurring in or using the ecological community	Not required as proposal will not impact on Endangered Ecological Communities	After appropriate consideration of impacts on EECs, this should be addressed to meet the DGRs requirements

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
• installation, operation and maintenance of buildings and utilities, in particular sewerage and water pipelines, powerlines, carports, lawns, fences, walking tracks etc	Not required as proposal will not impact on Endangered Ecological Communities	Not addressed in the SIS as it is considered that there are no impacts on EEC After appropriate consideration of impacts on EECs, this should be addressed to meet the DGRs requirements
• fire management, including construction and maintenance of asset protection zones	Not required as proposal will not impact on Endangered Ecological Communities	
• construction and utilisation of access and transport routes	Not required as proposal will not impact on Endangered Ecological Communities	
• increased visitation pressure on adjacent vegetation and Tyagarah Nature Reserves	Not required as proposal will not impact on Endangered Ecological Communities	
• changes to noise levels and types of noise	Not required as proposal will not impact on Endangered Ecological Communities	
• changes to lighting	Not required as proposal will not impact on Endangered Ecological Communities	
• increase in numbers of people, domestic pets (if allowed on the site) and road traffic	Not required as proposal will not impact on Endangered Ecological Communities	
• changes in surface and sub-surface water flows; and	Not required as proposal will not impact on Endangered Ecological Communities	
• changes to water quality, including stormwater run-off and pollution	Not required as proposal will not impact on Endangered Ecological Communities	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
6.2 Discussion of conservation status For each ecological community present, details of its local, regional and State-wide conservation status, the key threatening processes generally affecting it, its habitat requirements and any recovery plan or threat abatement plan applying to it (Section 110(3)(b)).	Not required as proposal will not impact on Endangered Ecological Communities, but some discussion in section 6	Not addressed in the SIS as it is considered that there are no impacts on EEC After appropriate consideration of impacts on EECs, this should be addressed to meet the DGRs requirements
Each ecological community must be assessed to identify those likely to be affected by the proposal, and to identify the nature, extent and degree of the impacts. The assessment process must incorporate survey results, habitat mapping, identification and analysis of likely impacts, and any other relevant information.	Not required as proposal will not impact on Endangered Ecological Communities	
An “affected” ecological community is not necessarily a community that is determined as likely to be significantly impacted upon by the proposal. In determining which threatened ecological communities or their habitats are likely to be affected by the proposal, no consideration is to be given to the proposed ameliorative or compensatory measures. Therefore, a threatened ecological community that is likely to be impacted upon to any degree, may still be affected by the proposal and must be considered further in this and following sections of the SIS.	Not required as proposal will not impact on Endangered Ecological Communities	
The potential for conflict between measures to protect threatened ecological communities and their habitats and the measures required to provide adequate fire protection to the proposed structures of the development must be addressed. The Planning for Bushfire Protection guidelines (2001), Rural Fires Act 1997, and the Rural Fires and Environmental Assessment Amendment Act 2002 and “AS3959 Construction of Buildings in Bushfire Prone areas” must be used in determining impacts and affected species in relation to fire management and asset protection.	Not required as proposal will not impact on Endangered Ecological Communities	
The number of hectares and proportion of each vegetation community and the habitat features in the study area that will be removed or affected by the proposed action must be provided.	Not required as proposal will not impact on Endangered Ecological Communities	
In determining which endangered ecological communities or their habitats are likely to be affected by these measures no consideration is to be given to proposed ameliorative or compensatory measures. Reasons for exclusion of any endangered ecological community must be justified. The following requirements of Section 6 must be addressed for those ecological communities still determined as affected by the proposal.	Not required as proposal will not impact on Endangered Ecological Communities	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
6.2.1 Significance within a local context		
Identification of all known locations of each affected endangered ecological community in the locality must be provided. The ecological community is to be discussed, including (unless stated that it is not available):	Not required as proposal will not impact on Endangered Ecological Communities	
• the extent in hectares of each endangered ecological community		
• their locations, relative to each other and depicted on a map	Not required as proposal will not impact on Endangered Ecological Communities	
• the time since last fire at each location	Not required as proposal will not impact on Endangered Ecological Communities	
• an assessment of the conservation significance of locations of the ecological community in the study area, including an assessment of the significance of the ecological community in the study area in the context of the locality	Not required as proposal will not impact on Endangered Ecological Communities	Not addressed in the SIS as it is considered that there are no impacts on EEC
• an indication of the degree to which the size and structure of the ecological community would be affected by the likely impacts of the proposal; and	Not required as proposal will not impact on Endangered Ecological Communities	After appropriate consideration of impacts on EECs, this should be addressed to meet the DGRs requirements
• the tenure and long term security of other localities	Not required as proposal will not impact on Endangered Ecological Communities	
The relative significance of the subject site for the endangered ecological community shall be discussed. The assessment of the community should be considered in terms of the following features including, the size of the remnant, the quality of the habitat and the level of disturbance on this site in comparison to other sites in the locality	Not required as proposal will not impact on Endangered Ecological Communities	
Where it is stated that the information required is not available, details must be provided to demonstrate that this information was sought and, if relevant, the limitations to the assessment due to the lack of information have been considered	Not required as proposal will not impact on Endangered Ecological Communities	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
<u>6.2.2 Discussion of corridor values</u> The potential of the proposal to increase fragmentation of the community and increase edge effects must be discussed. If corridors that allow connectivity between localities of endangered ecological communities are present within the subject site, the impact of the proposal on these areas shall also be discussed	Not required as proposal will not impact on Endangered Ecological Communities	Not addressed in the SIS as it is considered that there are no impacts on EEC After appropriate consideration of impacts on EECs, this should be addressed to meet the DGRs requirements
<u>6.2.3 Discussion of regional significance</u> Information and a discussion of the regional abundance of each affected endangered ecological community must be provided. This must include (unless stated that it is not available): the area occupied by the ecological community	Not required as proposal will not impact on Endangered Ecological Communities	
the distribution pattern of the ecological community; and	Not required as proposal will not impact on Endangered Ecological Communities	
a determination of the conservation significance of the study area with respect to regional abundance	Not required as proposal will not impact on Endangered Ecological Communities	
If the locality is of particular value from a regional perspective this shall be noted and discussed. If the locality is not considered of particular value from a regional perspective this shall be noted and discussed. This is to include the “stepping stone” value of the subject site for “affected” species i.e. the role of the subject site in the landscape including consideration of movement and foraging by threatened fauna and dispersal of threatened flora by wind, animal or other vector	Not required as proposal will not impact on Endangered Ecological Communities	
Where it is stated that the information required is not available, details must be provided to demonstrate that this information was sought and, if relevant, the limitations to the assessment due to the lack of information have been considered	Not required as proposal will not impact on Endangered Ecological Communities	
<u>6.3 Assessment of habitat</u> A full description of the type, location, size and condition of the habitat of the ecological community and details of the distribution and condition of similar habitats in the region (Section 110 (3)(c))	Not required as proposal will not impact on Endangered Ecological Communities	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
6.3.1 Description of disturbance history If the site shows signs of disturbance, details should be provided of the site's disturbance history and an assessment should be made of the ability of the ecological community to recover to a pre-disturbance condition	Not required as proposal will not impact on Endangered Ecological Communities	
6.3.2 Extent of habitat removal The location, nature and extent of habitat removal or modification which may result from the proposed action including the cumulative loss of habitat from the study area (including all proposed DAs and those areas in the subject area already with development consent or identified for development) and the impacts of this on the viability of the endangered ecological community in the locality	Not required as proposal will not impact on Endangered Ecological Communities	Not addressed in the SIS as it is considered that there are no impacts on EEC After appropriate consideration of impacts on EECs, this should be addressed to meet the DGRs requirements
This shall include an assessment of the proportion of the endangered ecological community to be affected by the proposal, in relation to the total extent of the endangered ecological community, and the impact of this on the viability of the endangered ecological community in the locality	Not required as proposal will not impact on Endangered Ecological Communities	
7. Ameliorative and Compensatory measures – Section 7		
7.1 Description of ameliorative and compensatory measures A full description and justification of the measures proposed to mitigate any adverse effect of the action on the species and populations and ecological community including a compilation (in a single section of the statement) of those measures (Section 110 (2)(i) and Section 110 (3)(f)).	5.4	Not adequately provided in SIS as it is considered in the SIS that no species, populations or EECs will be impacted by the proposal
Ameliorative and compensatory measures must be considered and discussed for each affected species and ecological community. If a species or population will, or potentially will, be impacted or affected by the proposal actions must be developed to mitigate the threatening process, or to provide protection against the threatening process, or both. Ameliorative measures contained in the SIS should be relevant and adequate with regard to "affected" threatened species, endangered populations and endangered ecological communities.	Table 5.1 Advice	After appropriate consideration of affected species and impacts on EECs, adequate information on ameliorative and compensatory measures should be provided such that the DGRs are met In addition, see comments in Section 5.6 of this report

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
Measures proposed to address the impacts of the proposal must be developed using the following approach: • step 1: where possible, AVOID (e.g. eliminate option, locate elsewhere etc) the process causing the impact; • step 2: where step 1 is not possible, AMELIORATE (reduce the intensity or extent or other undesirable characteristic of the impact); • step 3: where steps 1 and 2 are not possible, COMPENSATE for the impact; or • a combination of the three.	Avoidance and buffering is illustrated in constraints analysis provided in Figs. 5.24-5.37	
A detailed description and justification of the measures proposed to address any adverse effects of the proposal on all affected threatened species and endangered ecological communities must be provided. Each measure identified must indicate which of the above three categories the measure falls within, and where it is necessary to proceed to Steps 2-4 the reasons for this progression must be justified.	5.4 Not required as proposal will not impact on Endangered Ecological Communities and no species will be affected	Not adequately provided in SIS as it is considered in the SIS that no species, populations or EECs will be impacted by the proposal
Additional measures directed toward the conservation of threatened species or populations may be proposed. Benefits to non-affected threatened species and threatened species not detected during the surveys from the proposed ameliorative measures should also be documented. A summary of this information is also to be provided in a tabular form.	Table 5.1; Volume 3	After appropriate consideration of affected species and impacts on EECs, adequate information on ameliorative and compensatory measures should be provided such that the DGRs are met
Measures proposed may include, but are not limited to: • fire, pest and weed management;	3.7.6 5.8 Volume 3	In addition, see comments in Section 5.6 of this report
• sediment and pollution control;	5.1.6	
• noise control and management;	Limitations of vehicular movements and speed, small development footprint. See Plan Set	
• light control and management;	5.2.5	
• habitat creation, rehabilitation or enhancement; management of the effects of any proposed use of fill;	Volume 3	
• management of the effects of any proposed reshaping and filling drains;	3.3	
• translocation – as a welfare of individual/s management issue;	No translocation proposed	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
increased protection (through changes in land tenure or zoning, or the application of other planning instruments etc) of areas of high conservation significance;	3.7.3 3.7.4 3.7.5 7.10	Not adequately provided in SIS as it is considered in the SIS that no species, populations or EECs will be impacted by the proposal After appropriate consideration of affected species and impacts on EECs, adequate information on ameliorative and compensatory measures should be provided such that the DGRs are met In addition, see comments in Section 5.6 of this report
facilitating movements of wildlife;	Volume 3	
actions addressing specific stages (e.g. pre-construction, construction, occupation) and actions of the proposal;	Plan Set and Section 3	
actions to address specific issues (e.g. management of water quality and quantity); and	Volume 3	
compensatory strategies.	None required but reforestation described in Volume 3	
The mitigating, ameliorative and compensatory measures proposed must be provided as a draft management plan for all affected subject species and ecological communities. The draft Management Plan must be included in the SIS. Measures presented in this section of the SIS must only be included where the applicant and the landowner agree to the proposed ameliorative measures being included. This plan will include all management and mitigating measures proposed for all stages of the proposal including the pre-construction, construction and occupation phases.	No affected species thus a Draft Management Plan not required	
This draft management plan is to include the: rationale for the management (identification of the impact, or potential impact to one or more affected species, i.e. the need for ameliorative/mitigative/compensatory measures to be implemented);	No affected species thus a Draft Management Plan not required	
management objective (what the measure is trying to achieve and how it will mitigate the impact);	No affected species thus a Draft Management Plan not required	
management implementation (the actions required to achieve the objective). This section must include the location of the action, the persons responsible for the action being undertaken and the timeframe of the action (frequency, intensity, and duration);	No affected species thus a Draft Management Plan not required	
monitoring program (the parameters to be measured, the methodology and the frequency of measurements) to determine the success of the ameliorative/mitigative/compensatory measure and any corrective action required (see 7.1.3);	No affected species thus a Draft Management Plan not required	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
• corrective action that will be taken if necessary (determined from results of monitoring)	No affected species thus a Draft Management Plan not required	Not adequately provided in SIS as it is considered in the SIS that no species, populations or EECs will be impacted by the proposal After appropriate consideration of affected species and impacts on EECs, adequate information on ameliorative and compensatory measures should be provided such that the DGRs are met In addition, see comments in Section 5.6 of this report
• criteria to determine the success of management (these must be specific and measurable); and	No affected species thus a Draft Management Plan not required	
• reporting requirements	No affected species thus a Draft Management Plan not required	
The potential for conflict between avoidance, ameliorative and compensatory measures to protect threatened species and their habitats must be addressed. Any avoidance, ameliorative and compensatory measures must ensure that the provisions or application of the Planning for Bushfire Protection guidelines (2001) and the Rural Fires and Environmental Assessment Amendment Act 2002 and "AS3959 Construction of Buildings in Bushfire Prone areas" do not partially or totally nullify them	No affected species thus a Draft Management Plan not required	
Should the DEC decide to grant concurrence to the proposal, if requested by Council or the Minister for Planning, a condition of the concurrence would be the implementation of the Management Plan for the Threatened Species and Ecological Communities for the proposed development	No concurrence sought/required	
7.1.1 Ancillary Works Ameliorative and compensatory measures to be undertaken, in association with ancillary works, such as water quality (stormwater) and water quantity must also be addressed in the draft Plan of Management. The primary purpose of such ancillary works is other than for threatened species management, but they may have secondary benefits to threatened species and their habitat, e.g. sedimentation fences placed at appropriate locations and maintained accordingly may benefit threatened species using the study area	No affected species thus a Draft Management Plan not required	
These types of ancillary works, if not approached with consideration to threatened species and their habitat, may lead to the degradation of threatened species habitat. Therefore, it must be demonstrated how the proposed ancillary works have been designed and located to benefit threatened species. On-going postconstruction stormwater discharges from the proposed development have the potential to significantly impact habitat by virtue of their flow and quality. Details of how stormwater flow and quality impacts will be managed are to be provided	No affected species thus a Draft Management Plan not required	
Details of the monitoring and maintenance required to ensure these measure succeed in maintaining threatened species habitat (to the extent that the impacts may occur) must be provided	No affected species thus a Draft Management Plan not required	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
Any strategies presented here are to be incorporated into the Draft Management Plan identified in Section 7.1 above	No affected species thus a Draft Management Plan not required	Not adequately provided in SIS as it is considered in the SIS that no species, populations or EECs will be impacted by the proposal After appropriate consideration of affected species and impacts on EECs, adequate information on ameliorative and compensatory measures should be provided such that the DGRs are met In addition, see comments in Section 5.6 of this report
<u>Water quality</u> Details are to be provided of how the water quality to the adjacent habitats will be maintained, including details of: the location and design of stormwater treatment areas, sedimentation traps, and other relevant infrastructure, including the standards they will be required to adhere to	3.6 Volume 3	Section 6 Water Cycle Management in Volume 3 of the SIS discusses management of on site water including rainwater, wastewater and stormwater. As mentioned in Section 4.4.3 of this report, the water quality information provided by the proponent (as detailed in Section 6 of Volume 3 of the SIS) is insufficient to adequately assess potential water quality impacts and subsequent impacts on vegetation, habitat and species.
the parameters of weather conditions when construction activity will not be undertaken	Pursuant to Work Cover Regulations	
the design of stormwater management infrastructure to control ongoing postconstruction stormwater impacts e.g., source controls such as grassed swales, rather than kerbing and guttering, and rainwater tanks together with end of pipe treatments. These are considered integral in managing these impacts	Volume 3 and Plan Set	
the location and timing of monitoring checks. For example, it could be stated in the SIS that “discharge zones will be monitored:	Volume 3	
weekly during construction and for 3 months postconstruction	Volume 3	
monthly for 2 years after the first 3 months postconstruction, and	Volume 3	
within 24 hours of rainfall events, emergency checks are required, regardless of the stage of the development”.	Volume 3	While a number of measures are provided to mitigate against potential impacts post construction (many of which will reduce potential impacts), there is little to no discussion of impacts associated with construction of the required services and infrastructure, or reference to timing of construction

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
• plant species that are recommended as suitable for planting in stormwater treatment areas, and	Volume 3 which identifies relevant Tales in development application	Section 6 Water Cycle Management in Volume 3 of the SIS discusses management of on site water including rainwater, wastewater and stormwater. As mentioned in Section 4.4.3 of this report, the water quality information provided by the proponent (as detailed in Section 6 of Volume 3 of the SIS) is insufficient to adequately assess potential water quality impacts and subsequent impacts on vegetation, habitat and species. While a number of measures are provided to mitigate against potential impacts post construction (many of which will reduce potential impacts), there is little to no discussion of impacts associated with construction of the required services and infrastructure, or reference to timing of construction Not adequately provided in SIS as it is considered in the SIS that no species, populations or EECs will be impacted by the proposal After appropriate consideration of affected species and impacts on EECs, adequate information on ameliorative and compensatory measures should be provided such that the DGRs are met In addition, see comments in Section 5.6 of this report
• baseline data of the water quality, including pH, oxygen levels etc and identified thresholds are to be maintained. These thresholds are to be justified in terms of maintaining threatened species habitat.	Volume 3	
<u>Water quantity</u> Details to be provided of how water quantity to the water dependent threatened species habitats will be maintained. Measures are to be provided to avoid a reduction in the amount of water entering the adjacent habitat as a result of stormwater or sediment management or road design.	Volume 3	
Details of the location and timing of the monitoring checks are to be provided. For example, it could be stated in the SIS that “monitoring is to occur: • during rainfall events in the construction phase, and • within 24 hours of rainfall event, regardless of the stage of the development.”	Volume 3	
Baseline data of the water quantity and natural flow regimes are to be provided and identified thresholds for water flow are to be maintained. These thresholds are to be justified in terms of maintaining threatened species habitat.	Volume 3	
<u>7.1.2 Long term management strategies</u> Consideration shall be given to developing long term management strategies to protect areas on the subject site and within the study area which are of particular importance for the threatened species or endangered ecological communities likely to be affected by the proposal. This may include proposals to restore or improve habitat on site where possible, maintenance of wildlife corridors, fire management.	Volume 3	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
Any proposed measures for habitat creation, rehabilitation or enhancement must aim to minimise the time between impacts of the proposal on the habitat and commencement of the measure. Interim measures to mitigate the impacts are to be investigated and if options are available these are to be documented e.g. use of nest boxes and removal of lantana around appropriate Eucalypt species to provide immediate koala habitat. Any strategies presented here are to be incorporated into the Draft Management Plan identified in Section 7.1 above.	Volume 3 No draft plan of management required	
<u>7.1.3 Compensatory strategies</u> If the impacts of the proposal on affected threatened species and ecological communities cannot be avoided, or significantly reduced by ameliorative measures, compensatory strategies must be considered. These strategies must contribute significantly to the long term conservation of affected threatened species or ecological communities.	No affected species thus compensatory strategies not required	
The extent and cost of these compensation strategies should reflect the extent and conservation significance of those habitat(s) being impacted and the level of degradation or destruction of the habitats being compensated for. The proposed actions of a compensatory strategy must be located (in order of preference) within the study area, locality or region.	No affected species thus compensatory strategies not required. However, costings of reafforestation works provided	Not adequately provided in SIS as it is considered in the SIS that no species, populations or EECs will be impacted by the proposal
More than one compensatory strategy may be outlined if considered appropriate.	No affected species thus compensatory strategies not required	After appropriate consideration of affected species and impacts on EECs, adequate information on ameliorative and compensatory measures should be provided such that the DGRs are met
Compensatory strategies may involve, but are not limited to: translocation of the threatened species, populations or ecological communities;	Advice	In addition, see comments in Section 5.6 of this report
provision of compensatory habitat. Lands containing habitat(s) of high conservation value (with the same or similar ecological values) may be provided for subsequent ownership or management, or both, by organisations with appropriate conservation management expertise, preferably the DEC;	Advice	
identification and implementation of measures to improve habitat(s) of high conservation value (with the same or similar ecological values); and	Advice	
identification and implementation of measures (for example, changes in land tenure or zoning, or the application of other planning instruments) to improve the level of protection of areas of high conservation significance.	Advice	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
Any compensatory proposal will outline the desired outcomes and implementation mechanisms. Proposed compensatory and ameliorative measures will preferably have been trialled and found appropriate in similar contexts elsewhere. They should employ current best practice. Where available, literature references outlining the techniques or its use must be provided. Proposed techniques or measures that have not been used elsewhere may be utilised. However, they must be implemented utilising an experimental design framework and their effectiveness rigorously monitored and documented.	No affected species thus compensatory strategies not required	
Compensatory benefits likely to result from such measures proposed for alternative sites are to be discussed and evaluated along with a discussion of mechanisms of how they might best occur.	No affected species thus compensatory strategies not required. However, see reforestation and waterbody management in Volume 3	Not adequately provided in SIS as it is considered in the SIS that no species, populations or EECs will be impacted by the proposal
If proposed compensatory strategies require the involvement of individuals, community groups or organisations external to the proponent these potential stakeholders must be consulted where appropriate regarding the strategy and their responses provided.	No affected species thus compensatory strategies not required	After appropriate consideration of affected species and impacts on EECs, adequate information on ameliorative and compensatory measures should be provided such that the DGRs are met
Any strategies presented in this section are to be incorporated into the Draft Management Plan identified in Section 7.1 above.	No affected species thus plan of management not required	In addition, see comments in Section 5.6 of this report
<u>Translocation</u> Translocation is often proposed as a mitigating, ameliorative or compensatory measure for the loss of, or potential loss of, individuals or populations of a threatened species as a result of a development. Translocation should not be seen as an alternative to in situ conservation. The biological rationale for translocating must be worked out for each individual case, but translocation as a conservation measure should only proceed when it can be demonstrated with acceptable certainty that there will be no irreparable harm to the species as a whole (Falk et al. 1996). If translocation is proposed as an action in the SIS, then the approach must be adequately demonstrated and justified.	No translocation proposed	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
In general, the DEC will not consider translocation to be a compensatory, mitigating or ameliorative measure because: • transferring the gardening approach from a few individuals of a hardy cultivar, or growing a few frogs from tadpoles in a tank, to establishing an entire population of a threatened species involves an increase in complexity that exceeds our technical capabilities (Berg 1996); • translocation is not a simple matter of moving plants or plant material, or animals, from a development site to a proposed translocation site. The conservation of a species also requires the supporting context of its habitat (Falk <i>et al.</i> 1996); • trading-off naturally occurring habitat for created systems that have unknown ecological value and an uncertain future means brunt of uncertainty falls primarily on the replacement population (Falk <i>et al.</i> 1996); • the time it takes for translocated species to become part of a functioning ecological community, if they ever do, may take decades to equilibrate. Therefore, translocation requires a long-term commitment, generally in excess of ten years; • biological uncertainties are problematic and it is difficult to fit the required complicated biological experiment into a framework dictated by the scheduling requirements and financial constraints that accompany land-development projects (Howald 1996); and • attempts to translocate threatened species have generally been unsuccessful (ANPC 1997; Morgan 1999). Therefore, if the translocation does not succeed in the long term it is likely to be too late to retrieve the original habitat (ANPC 1997).	No translocation proposed	Not adequately provided in SIS as it is considered in the SIS that no species, populations or EECs will be impacted by the proposal After appropriate consideration of affected species and impacts on EECs, adequate information on ameliorative and compensatory measures should be provided such that the DGRs are met In addition, see comments in Section 5.6 of this report
However, the DEC will support translocation of threatened species: • as a compensatory or ameliorative measure if the proposal includes provisions that the destruction of the wild or natural population(s) (in whole or in part) and their habitat will not be allowed, until the translocated population(s) have been determined to be successful. This would require a long-term commitment (as stated before, generally in excess of 10 years). • as an additional measure (and not as an ameliorative or compensatory measure) where the purpose is the welfare of individuals and/or to salvage genetic material to be or likely to be destroyed by the development proposal	No translocation proposed	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
All translocation proposals for threatened flora must follow the Australian Network for Plant Conservation's (2004) Guidelines for the Translocation of Australian Plants, and for threatened fauna must follow the DEC threatened fauna translocation policy (NPWS 2001). Proposals required as part of a development must: • provide adequate time for project development, including both restoration designers and contractors in the earliest stages of planning	No translocation proposed	Not adequately provided in SIS as it is considered in the SIS that no species, populations or EECs will be impacted by the proposal After appropriate consideration of affected species and impacts on EECs, adequate information on ameliorative and compensatory measures should be provided such that the DGRs are met In addition, see comments in Section 5.6 of this report
• consider whether the species has been translocated previously and whether it was a success or a failure. If it was a failure the reasons for the failure should be explored and whether they are able to be, or likely to be, rectified. This is critical in determining whether translocation should be further considered as a compensatory option. If it cannot be demonstrated that the reasons for failure can be rectified successfully then the population should not be allowed to be destroyed, in whole or in part	No translocation proposed	
• aim to ensure no net loss of the species or its habitat occurs	No translocation proposed	
• allow for the maintenance of genetic integrity and effective genetic processes	No translocation proposed	
• include a detailed monitoring program and is to consider Section 7.1.3 of these DGRs. The monitoring program may be required to continue for five or fifty years, but it is clear that 2-3 years of data are rarely enough (Sutter 1996) and is not enough to evaluate successful establishment and long term viability of many species (Gann & Gerson 1996). The time this takes will be relative to the lifecycle of the species, e.g. an annual plant may require at least a 5 year monitoring program whereas a long lived species may require monitoring for at least 50- 100 years	No translocation proposed	
• include the criteria that must be used to determine whether a translocation project is successful. The minimum criteria for ameliorative or compensatory translocations must be that: 1) the translocated population contains sexually mature individuals and displays evidence of recruitment, and 2) that those recruits (the second generation) are capable of producing viable offspring; and	No translocation proposed	
• ensure translocation sites are protected and managed in perpetuity as exotic species and human-induced disturbances will continue to affect the translocation project (Gann & Gerson 1996). Any strategies presented here are to be incorporated into the Draft Management Plan identified in Section 7.1 above	No translocation proposed	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
<u>Compensatory Habitat</u> For all compensatory habitat proposals provide: • details of the property(s) proposed as compensation, including agreement from the landowner that the property will be sold to the applicant, or paperwork demonstrating that the applicant owns the property or has purchased the property • a description of the land area, including precise delineation of the area in terms of area (hectares) and boundaries (as depicted on a map). If a specific area has not been determined, indicate options • a description of the habitat type(s) that will be provided by the compensatory habitat • a description of the area occupied by, the quality of and characteristics of, that habitat that is of benefit to fauna, particularly threatened species • a list of threatened species (particularly those considered likely to be affected by the proposal) that may or are likely to benefit by the provision of that habitat and the usage of the habitat and its features suitable for that species • details of the long-term security of the site • an assessment of any proposed rehabilitation works required in the proposed compensatory habitats to control exotic weed species in those areas • Indicate if other uses are proposed for the compensatory habitat area. If so, provide the locations and dimensions of these uses, and the way and degree in which and to which, respectively, they may impact upon the nature conservation and threatened species habitat values of the area. Any strategies presented here are to be incorporated into the Draft Management Plan identified in Section 7.1 above	No translocation proposed No translocation proposed No translocation proposed No translocation proposed No translocation proposed No translocation proposed No translocation proposed	Not adequately provided in SIS as it is considered in the SIS that no species, populations or EECs will be impacted by the proposal After appropriate consideration of affected species and impacts on EECs, adequate information on ameliorative and compensatory measures should be provided such that the DGRs are met In addition, see comments in Section 5.6 of this report
<u>Habitat restoration</u> A habitat restoration plan is to be provided within the draft Threatened Species Management Plan for the site. The habitat restoration plan is to be prepared by a qualified and experienced bush regenerator. It is not to be a landscape plan	No affected species. Thus, threatened species management plan and habitat restoration plan not required. However, reforestation and natural area management described in Volume 3	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
In addition to the requirements for the draft Threatened Species Management Plan for the site, it is to include the following: • identification of the threatened species that the habitat is being restored for	No affected species. Thus, threatened species management plan and habitat restoration plan not required. However, reforestation and natural area management described in Volume 3	
• the time it will take for the attributes to become useful for the species	As per habitat restoration above	Not adequately provided in SIS as it is considered in the SIS that no species, populations or EECs will be impacted by the proposal After appropriate consideration of affected species and impacts on EECs, adequate information on ameliorative and compensatory measures should be provided such that the DGRs are met In addition, see comments in Section 5.6 of this report
• identification of the habitat attributes that are missing for the species and what needs to be provided for in the plan	As per habitat restoration above	
• details of the techniques to be used, including weed control	As per habitat restoration above	
• impacts of proposed techniques on each affected species e.g. removal of certain species when frogs are active in the wet conditions, wallaby control etc	As per habitat restoration above	
• conditions that are to be applied to planting i.e. season of planting, fertiliser and pesticide use, genetic issues with source of material	As per habitat restoration above	
• discussion of how such a large amount of appropriate propagation material will be sourced and stocked within the timeframe	As per habitat restoration above	
• timing of the overall process and stages of the project	As per habitat restoration above	
• a detailed monitoring proposal	As per habitat restoration above	
• qualifications of the person(s) to implement the plan; and	As per habitat restoration above	
• criteria that will be used to ensure threatened species will not be adversely affected by the proposed habitat restoration	As per habitat restoration above	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
<u>7.1.4 Ongoing monitoring</u> Any actions or measures proposed to avoid, mitigate, ameliorate or compensate for the impacts of the proposal on threatened species, populations or ecological communities (to be done during the pre-construction, construction and occupation phases) are to be monitored to evaluate the effectiveness of the measures. Details of the monitoring program are to be provided, including for each action or measure, the objectives of the monitoring, the method of monitoring, the reporting framework, the duration and frequency, and a feedback loop to refine and improve management actions	The proposal will not impact on threatened species populations. Monitoring with respect to the dune management plan is described in Volume 3	
The monitoring program is to be relevant to the reasons for the monitoring. Monitoring programs that are inadequately designed, may lead to misleading and meaningless results. In a worst case scenario, this could result in the extinction of the local population. To ensure the monitoring program is able to determine the effectiveness of the proposed ameliorative measures for threatened species and ecological communities it is to: • be designed to detect changes with an acceptable level of precision	The proposal will not impact on threatened species populations. Monitoring with respect to the dune management plan is described in Volume 3	Not adequately provided in SIS as it is considered in the SIS that no species, populations or EECs will be impacted by the proposal
• be clearly described so that any person may continue the monitoring program	See above with respect to monitoring	After appropriate consideration of affected species and impacts on EECs, adequate information on ameliorative and compensatory measures should be provided such that the DGRs are met In addition, see comments in Section 5.6 of this report
• be undertaken so that data is collected over a meaningful time period to detect changes or long-term trends	See above with respect to monitoring	
• include short term (first five years) and long-term monitoring (beyond five years)	See above with respect to monitoring	
• determine the effectiveness of the threat management proposed, such as habitat restoration (including weed removal) and stormwater run-off and management	See above with respect to monitoring	
• detect changes to the site in relation to the composition and structure of the ecological community or habitat of threatened species as a result of works undertaken and ameliorative measures	See above with respect to monitoring	
• include monitoring of specific threatened species or key species in an endangered ecological community that are likely to be affected by the proposed development as a result of works undertaken and ameliorative measures	See above with respect to monitoring	
• include the criteria for determining the success or failure of the action or measure. These criteria are to include short to long term criteria, as relevant, and	See above with respect to monitoring	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
include an a process for evaluating the success or failure of an action or measure that has been monitored and for corrective action to be taken should the monitoring demonstrate that the action or measure has failed to protect threatened species or species occurring in ecological communities	See above with respect to monitoring	
It will not be assumed that mitigating measures or actions being done are not impacting on threatened species, ecological communities or their habitats until the predetermined criteria for measure the success or failure of the action or measure has been evaluated against the data collected	See above with respect to monitoring	Not adequately provided in SIS as it is considered in the SIS that no species, populations or EECs will be impacted by the proposal
As stated in 7.1.3, ameliorative strategies that have not previously been proved effective should be undertaken under experimental design conditions and appropriately monitored, particularly for translocation proposals. Objectives of any monitoring plans are to include identifying any modifications needed to improve the effectiveness of ameliorative measures	See above with respect to monitoring	After appropriate consideration of affected species and impacts on EECs, adequate information on ameliorative and compensatory measures should be provided such that the DGRs are met
Effective monitoring requires sufficient baseline data. Data from surveys must be considered and its contribution to the necessary baseline data is to be discussed. Where deficiencies are identified, the necessary data should be obtained prior to construction commencing. Where sufficient baseline data will not be collected, the limitations to the monitoring program are to be discussed. Consideration and efforts proposed to minimise the potential for misleading and meaningless data to be gathered are also to be discussed. Any monitoring proposals presented here are to be incorporated into the Draft Management Plan in 7.1 above	See above with respect to monitoring	In addition, see comments in Section 5.6 of this report
<u>7.1.5 Contingency Actions</u> Contingency actions are the type of actions that the proponent is prepared to implement or undertake should the results of the monitoring (identified in section 7.1.4) indicate the mitigating measures fail to adequately avoid impacts to threatened species and cannot be rectified	Section 7	Not adequately provided in SIS as it is considered in the SIS that no species, populations or EECs will be impacted by the proposal After appropriate consideration of affected species and impacts on EECs, adequate information on ameliorative and compensatory measures should be provided such that the DGRs are met
Details must be provided of the type of contingency actions that the proponent is prepared to implement or undertake as part of the development proposal. These actions are to be in the form of new and additional measures	7.1 – 1.10	After appropriate consideration of affected species and impacts on EECs, adequate information on ameliorative and compensatory measures should be provided such that the DGRs are met In addition, see comments in Section 5.6 of this report

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
8 Description of feasible alternatives and justification for the proposal		
A description of any feasible alternatives to the action that are likely to be of lesser effect and the reasons justifying the carrying out of the action in the manner proposed, having regard to the biophysical, economic and social considerations and the principles of ecologically sustainable development (Section 110(2)(h) and Section 110(3)(e)).	7.1 – 1.10	Four alternatives to the entire project provided in Section 7, as well as possible future character, pros and cons. Justification for the proposal is also provide in Section 7.10 in relation to North Coast REP, Byron LEP, Byron Suffolk Park LEP, NSW Coastal Policy and Byron DCP 18
This section requires a description of the feasible alternative for each mitigating and compensatory measure proposed. It is not to simply address alternatives to the overall proposal itself.	Section 7	Not provided, only considered options for the proposal
An assessment is required to justify why the proposal is needed by society and whether it is consistent with Local and Regional Environment Plans and with Council and State Government policies on coastal development, urban growth and ecological sustainability. In particular, the following documents must be considered and discussed: North Coast Regional Environment Plan, Byron Shire Local Environment Plan 1988 (and any proposed changes to this LEP), Byron Shire Tourism Management Options Paper, NSW Coastal Policy 1997, the Draft Byron Biodiversity Conservation Strategy and Development Control Plan No. 18.	7.10	Discussion provided in Section 7.10 Some discussion of policies/plans more detail than others Where other documents are reference, relevant section not provided
Where a Development Application, Statement of Environmental Effects, Environmental Impact Statement or Review of Environmental Factors deals with these matters the SIS may use the relevant sections of the DA, SEE, EIS or REF as an appendix in the SIS. However, a summary is to be provided in this section. Depending on the thoroughness of the information in these documents in considering threatened species and their habitats, further work may be required to adequately address this section.	✓	Additional detail in terms of threatened species issues not always adequately provided in SIS or supporting documentation
The assessment must include details of the condition and use of other parts of the subject site and why these can or cannot be considered as feasible alternatives. A lack of consideration to threatened species and ecological communities in the planning stages of the development are not considered to be reasonable justification.	See constraints analysis in Figs. 5.25 – 5.38	No context provided for Figures 5.25 – 5.38. Need discussion of constraints analysis, not provided in SEE either

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
This information is essential to allow a proper socio-economic assessment of the proposal by the Director-General of NPW, as required by Section 79C of the Environmental Planning and Assessment Act 1979, should the proposal be presented by the determining authority to the DEC for concurrence. This requires an assessment of how the local and regional social environment would be altered, in a positive or negative way or both, if the proposal were to be approved and if the proposal were to be refused.	See constraints analysis in Figs. 5.25 – 5.38	No obvious discussion of socio-economic issues in relation to proposed development provided in Section 7.
Similarly, the economic consequences of the proposed development are to be evaluated as for social consequences. However, it is important to include consideration of the broader economy and of how the local and regional economy would suffer or benefit if the proposal were to be approved and if the proposal were to be refused.	Section 7	Constraints analysis does address this (Figures 5.25-5.38), especially as not text provided
Additionally, the principles of ecologically sustainable development (ESD) which includes the precautionary principle are to be given detailed consideration. Under the Protection of the Environment Administration Act 1991 (POEA Act), ESD requires “the effective integration of economic and environmental considerations in decision-making processes. Ecologically sustainable development can be achieved through the implementation of the following principles and programs:	7.11	
the precautionary principle – namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific uncertainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by: i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and an assessment of the risk-weighted consequences of various options,	7.11	Discussion of ESD provided in Section 7.11
inter-generational equity – namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,	7.11	

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
conservation of biological diversity and ecological integrity – namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration, improved valuation, pricing and incentive mechanisms –namely that environmental factors should be included in the valuation of assets and services, such as: i) polluter pays – that is, those who generate pollution and waste should bear the cost of containment, avoidance and abatement, the users of goods and services should pay process based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,	7.11	Discussion of ESD provided in Section 7.11
environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimize costs to develop their own solutions and responses to environmental problems.”	7.11	
The principles that are necessary to understanding sustainable development are inter-generational equity, the precautionary approach and biodiversity conservation. In addressing ESD consideration, the following documents may provide guidance on the application of ESD: • National Strategy for ESD (ESD Steering Committee 1992) • Sustainable Development in Australia (Environment Australia 2002) • Applying the Precautionary Principle (Dewille and Harding 1997)	7.11	Assessment provided in Section 7.11
9. Additional Information		
<u>9.1 Qualifications and experience</u> A Species Impact Statement must include details of the qualifications and experience in threatened species conservation of the person preparing the statement and of any other person who has conducted research or investigations relied on in preparing the statement (Section 110(4)). Details of the experience in threatened species conservation of each person involved in the preparation of the SIS must be provided, with details of their contribution to the SIS documented. This is to include an assessment of how their experience is relevant to the work they contributed to the SIS. It is not sufficient to provide generalities or a standard resume or curriculum vitae.	Section 8 Volume 2: Appendix 4	CV not provided for all personnel Details of the experience in threatened species conservation of each person involved in the preparation of the SIS was not provided

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
<u>9.2 Other approvals required prior to undertaking the development</u> A list of any approvals that must be obtained under any other Act or law before the action may be lawfully carried out, including details of the conditions of any existing approvals that are relevant to the species or population or ecological community (Sections 110(2)(j) and 110(3)(g)). In providing a list of other approvals the following shall be included for each approval: • the name of the organisation responsible for granting the approval; • the title and section of the legislation under which the approval is to be or has been granted; • the purpose of the approval; and • the date (day/month/year) or the proposed date (month/year) of granting of the approval.	Section 9	Considered in Section 8 No consideration of the requirement for permits under FM Act

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
<u>9.3 Licenses required prior to undertaking surveys</u> Persons conducting flora and fauna surveys must possess appropriate licenses or approvals. The relevant legislation and associated licenses and approvals that are likely to be required are: NP & W Act: • General Licence (Section 120) authorising a person to harm or obtain any protected fauna (this may include threatened fauna) for various purposes, including carrying on any scientific investigation. • Licence (Section 132C) authorising a person to pick threatened species and ecological communities and damage their habitat for scientific investigation. These licenses must include the DEC's "Guidelines for the Collection of Threatened Plants and Plants that occur in Endangered Ecological Communities for Identification and Herbarium Voucher Purposes" and the "Guidelines for the Collection of Land Snails for Identification and Research Purposes". TSC Act: • Licence (Section 91) authorising a person to take action that is likely to result in one or more of: • harm to a threatened species, population or ecological community (so far as animals are concerned); • picking of a threatened species population or ecological community (so far as plants are concerned); • damage to a critical habitat; and • damage to a habitat of a threatened species, population or ecological community. Animal Research Act 1985: • Animal Research Authority to undertake fauna surveys.	Section 9	Licenses mentioned under Section 9.1 but no detail provided

Director General Requirements	Section of SIS (as provided in Appendix 6 of the SIS, Parker 2006a, b, c)	Assessment of Compliance
<u>9.4 Expiry of the DGRs</u> These DGRs have been prepared based on current knowledge and in accordance with the provisions of the TSC Act as at the date of this letter. If the preparation of the SIS takes longer than 12 months (365 days) from the date of this letter then the DEC Contact Officer nominated below must be consulted to determine if these DGRs need to be modified to reflect new information on the occurrence of threatened species, amendments to the TSC Act or any other relevant matter. Should you require further information on any of the above please contact the DEC Senior Threatened Species Officer Maria Matthes on (02) 66598239.	Are still current	Current at time of submission

5.8 Additional Information or Assessments the Applicant Should be Required to Provide

The following additional information that should be provided:

- Detailed methods, effort, dates and maps showing areas surveyed should be provided for flora surveys;
- A list of threatened species targeted during each of the flora surveys;
- List of subject species should be expanded to include all threatened species with potential habitat in the study area. Alternatively detailed justification for not including such species should be provided. Expanded list of ‘subject species’ will then require an assessment of likely impacts and further assessment for those considered ‘affected species’;
- Assessments of likely impacts on each subject species and endangered ecological community needs to be provided in detail, taking into account direct and indirect impacts such as edge effects (particularly where the buffer zones are part of APZs), habitat loss and increased human usage of the site as well as those listed under Section 5 of the DGRs;
- List of ‘affected species’ should be expanded to include all threatened species that could potentially be impacted by the proposed development, prior to consideration of reduce impacts as a result of mitigation measures. Further assessment of the impacts on each of these species and mitigation measures to reduce these impacts will then be required;
- Section 5-7 of the DGRs should be addressed in detail following identification of affected species;
- Adequate mapping of potential and known habitat

6.0 REVIEW OF SUBMISSIONS AND POLICIES

6.1 Submissions

This section provides a list of points from the submission regarding ecology that the authors either agree with or disagree with. However, not all points made in the submissions have been commented on, only issues relating to ecology or for which the authors are qualified have been commented on. Additionally, only submissions with issues relating to ecology have been commented on.

6.1.1 Dailan Pugh

The following statements made in Dailan Pugh's submission are supported:

- Future proposed stages of the development need to be discussed and the impacts must be assessed as a whole, not as separate stages;
- Inadequate consideration of most species and ecological communities known to occur in study area in the Eight Part Tests in the Flora and Fauna Report (Parker 2004) and SIS (Parker 2006a);
- Inadequate assessment of impacts under the EPBC Act;
- The SIS has not complied with the majority of the DGRs, particularly the provision of plans and maps; assessment of 'subject species' and 'affected species'; assessment of likely impacts on threatened species, populations and communities; and, ameliorative and compensatory measures. As noted, the SIS has not considered the effects of increased human numbers and disturbance on the adjacent EECs or on threatened bird species;
- The failure to adequately assess Endangered Ecological Communities, with a number of EECs overlooked completely (Freshwater Wetlands and Subtropical Coastal Floodplain Forest) and others only partially considered (Swamp Sclerophyll Forest is likely to cover a greater extent of the study area as many additional communities identified likely to qualify as part of the EEC). Impacts on EECs are not adequately addressed as Parker (2004) has failed to consider indirect impacts; and,
- Adequacy of buffers in mitigating against all direct and indirect impacts.

NB. Comments regarding DCP 18 and zoning have not been addressed as the authors are not qualified to comment.

6.1.2 DEC

The following statements made in the DEC submission are supported:

- The extent of vegetation removal for bushfire hazard reduction and construction is not provided in enough detail;
- Flora and Fauna report has not been updated to incorporate new listings of EECs. Assessments of Impact regarding these EECs have not been provided (i.e.. increased human visitation);
- Lack of adequate description of the study area. The SIS provides a description of the study site, but not the whole study area (e.g. Cape Byron State Conservation Area, Cape Byron Marine Park, Tyagarah Nature Reserve);
- Difficulty of determining the extent of vegetation removal proposed and potential impacts based on the plans provided and the scale and orientation of the plans;
- Habitat for threatened species and ecological communities has been underestimated in its extent;
- The unreliability and inadequacy of the statements made to justify the conclusion that there will be no impacts on threatened biodiversity. As discussed throughout this report, there is no acknowledgement that human visitation will increase as a result of the development and that this will impact on numerous species and that no habitat will be removed or impacted);
- Direct and indirect impacts on threatened biodiversity have not been adequately addressed or considered. The potential impacts to shorebirds needs to be assessed, acknowledging that visitation will increase and that proposed mitigation measures such as redirecting people north of the shorebird breeding area and educational brochures may not work. Walking tracks will increase impacts to adjacent habitat. Other indirect impacts such as roadkills and rubbish dumping have not been acknowledged or assessed;
- Wildlife corridors have not been discussed in enough detail;
- Revegetation and rehabilitation works proposed cannot be considered to contribute to amelioration of impacts of the proposed development unless they are in place at the time of construction works.

The following statements made in the DEC submission are not supported:

- The SIS complies with the requirement to identify subject species and adequate justification was provided for the exclusion of subject species suggested in the DGRs. On the contrary, the justification for eliminating these species was very brief and inadequate, as detailed above in Section 5.3. The SIS did not comply with the DGRs to identify subject species or affected species.

6.1.3 Marine Park Authority

The following statements made in the Marine Park Authority's submission are supported:

- the need for wider buffers for waterbodies linked to Belongil Estuary;
- SEPP 71 – Coastal protection needs to be addressed and the development referred to the Director General;
- Clause 39 of the Draft LEP for the Byron Bay Area needs to be addressed and recognition made by the proponent that the development would “have an effect on the plants or animals within the Marine Park or their habitat”;
- The Belongil Estuary Study and Management Plan needs to be addressed.

6.1.4 Jan Barham

The following statements made in Jan Barham's submission are supported:

- Cannot properly assess the full impacts of the proposed development, as it is a staged development and details of future stages are not provided or assessed;
- The SIS does not meet the DGRs.

6.1.5 Department of Lands

The following statements made in the Department of Lands' submission are supported:

- Need for more information in the Dune Management Plan addressing additional impacts from higher density of people using the areas, closure and management of tracks, community education and long term responsibility of implementing and funding the plan.

All points regarding the DMP are supported, but particularly:

- The impact of increased visitation needs to be discussed and management solutions developed;
- The whole coastal dune complex needs to be included;
- More details regarding the closure of the Belongil estuary track are required, particularly how the DMP proposes to prevent unauthorised access;
- Management of unauthorised beach tracks needs to be addressed;
- The long-term responsibility for implementation, funding and performance of the DMP need to be discussed and assured. To this regard, binding contracts or conditions of sale must be produced which ensure the DMP is implemented in perpetuity.

6.1.6 Byron Shire Council

The following statements/points made in Byron Shire Council's submission are supported:

16 May 2006 (only points under "Ecology" have been considered)

- The poor presentation and discussion of information, poor representation of habitat requirements and lack of records of some animal species does not provide confidence in the author's abilities;
- Lack of information regarding field survey techniques used to derive the vegetation associations, making it difficult to verify the accuracy;
- Lack of floristic information makes it difficult to determine whether vegetation communities occurring in the study area qualify as EECs;
- Two EECs present have been overlooked and the occurrence of one EEC has been inaccurately mapped;
- Numerous threatened or significant animal species have not been considered or have not been considered in sufficient detail;
- Maps of habitat for threatened animal species are not accurate and incorrectly suggest that the development footprint does not provide habitat for a number of threatened animal species, even when those species have been previously recorded under the development footprint;

- Eight Parts Tests are inadequate as they fail to consider EECs and threatened flora and fauna known to occur or have potential habitat in the study area;
- The SIS does not constitute a legally complying SIS as it does not meet many of the Director General's Requirements;
- Adverse impacts on a number of EECs and threatened species are ignored;
- Impacts to some threatened animal species are incorrectly dismissed as vagrants or seasonal occurrences;
- The removal of a number of Koala feed trees is ignored or insufficient details are provided to determine exactly which trees would be removed. However, the SEPP 44 assessment is considered adequate;
- The inadequacy of the positioning of open space areas within the proposed northern wildlife corridor;
- Although the Key Threatening Processes "Predation by the Red Fox" and "Invasion and Establishment of the Cane Toad" will continue on site, they are not expected to increase as a result of the proposal. More details concerning the proposal are required to determine whether the perimeter road would require the removal of native vegetation;
- Ineffectiveness of the southern wildlife corridor due to the lack of a road underpass (not enough details have been provided regarding roads and traffic volumes to determine whether the situation will be better or worse than the current situation) and the failure to include Lot 6 in the revegetation proposal;
- Lack of assessment of additional impacts of proposed future subdivision of western lots;
- The inappropriateness of revegetating the EEC Swamp Sclerophyll Forest with rainforest species;

16 June 2006

- The description of the development does not provide enough details, or is ambiguous, about the future size of the development, which does not permit an adequate assessment of the likely impacts of the proposal;
- Proposed development does not adequately address

- Clause 8 of SEPP 71,

- Clauses 15, 29A and 32B of the North Coast Regional Environmental Plan
- NSW Coastal Policy
- Clause 2, 36 and 63 of Byron LEP
- DCP No. 18
- Concern regarding the NSW Rural Fire Service's required 50 m APZ to EECs adjoining Lots 4 and 5;
- The SIS does not comply with the DGRs.

The following statements made in Byron Shire Council's submission are not supported:

- SEPP 44 is considered to be adequately addressed.

6.1.7 NSW Department of Natural Resources

The following statements/points made in DNR's submission are supported:

13 April 2006

- Need to remove existing buildings from areas threatened by beach erosion and Belongil Creek entrance migration;
- Need for a Part 3A permit and general conditions of permit;
- Comments on inadequacy of Dune Management Plan

8 May 2006

- Appropriate management measures must be implemented to control acid sulphate soil impacts and an approved acid sulphate soils management plan must be written;
- Erosion and sedimentation measures must be discussed and implemented;
- Proposed stormwater outlets to drainage lines must be designed to minimise erosion of watercourses.

6.1.8 NSW Department of Primary Industries

All points made in DPI's submission are supported, including:

- 100 m buffer zone between the development and the SEPP 14 wetlands. The best outcome for aquatic ecology would be achieved if the 100 m buffer incorporated re-establishment of ground cover, shrub and tree strata of native endemic vegetation;
- Permits required under FM Act for crossings of waterbodies;
- Inadequacy of Dune Management Plan.

6.1.9 Tanja and Adrian Nelson

The proponent does fail to acknowledge that the development would have impacts on any threatened species or EECs, which is false. Impacts to numerous species are expected (see above), although this does not necessarily mean they would be significantly impacted.

6.1.10 S J Connelly Pty Limited's Response to Submissions

The statement on page 2 that the waterbodies referred to are artificial is not supported. These waterbodies may be highly modified, but form a string of interconnected waterbodies in a natural drainage system which leads from the SEPP 14 wetland at the north of the site to the SEPP 14 wetland and Belongil Estuary at the south of the site.

It is considered necessary that the ecological impacts of all stages of the development be assessed as a whole, and not separately. If future stages are not assessed in the current assessments, then future stages must consider cumulative impacts from previous stages.

It is untrue that all "the important environmental features of the site are identified" or that they will be "protected". Again there is a lack of recognition that the development will increase impacts to numerous threatened species and ecological communities.

Although it is correctly stated that "no compelling reasons as to why it is considered the application should be referred to the Federal Environment Minister have been provided", the proponent doesn't provide EPBC Act assessment to enable readers to confirm whether a referral is required.

6.1.11 Peter Parkers Response to DEC

Threatened Biodiversity

- Not all areas of Swamp Sclerophyll Forest have been mapped, some additional areas that are likely to qualify as part of this EEC directly adjoin the proposed development area. Impacts on these EECs have not been assessed adequately.

Description of the study area

- Although the response (and SIS) accurately defines the study area, Section 2.1.2 of the DGRs are only addressed and mapped for the study site. The response claims that Figures 3.8, 3.9 and 3.13 address this concern, but these figures are only aerial photographs or copies of topographical maps and mostly don't provide the information requested in Section 2.1.2 of the DGRs.

Provision of relevant maps

- Maps provided in the report do not meet the DGRs, the response provided here is inadequate. The problem of scale can be easily overcome using GIS.

Discussion of existing fragmentation

- The response directs the reader to Sections 1.3 and 3.7 and to Figure 3.4, and yet none of these specifically discuss existing fragmentation.

Habitat maps

- Habitat mapping for threatened species and communities have been underestimated in many areas, particularly for a number of EECs that occur in the study area. Mapping of individual threatened species provided in the report is restricted to those that were previously recorded in the study area. No habitat mapping has been provided for species with potential habitat in the study area.
- The response that the distinction between actual and potential habitat is only made where scientific evidence is available is flawed. The habitat requirements for each species is the "scientific evidence" required to determine where potential habitat may occur and the location of previous records is the "scientific evidence" required to determine where actual habitat occurs.

Assessment of likely impacts on threatened species and populations

- Parker has not responded to the DEC comments and concerns detailed in this section of the submission in full. Specifically he has failed to respond to DEC's comment on the reliability of the statement 'no potential habitat will be removed or impacted'. As discussed throughout this report, the SIS fails to acknowledge that actual and/or potential habitat for threatened species will be removed by the proposal.
- Parker has failed to adequately respond to the comment regarding the scale of the proposal and the number of people utilising the site, instead he discusses sewage ETs. Nowhere within the SIS is the increase in people utilising the site or their potential impacts discussed.
- Allowing a walking track along the perimeter of the littoral rainforest and still insisting that there will be no indirect impacts on the EEC (such as track creation, trampling, weed invasion and rubbish dumping) is questionable. Public access to EECs and any buffers designed to protect EECs in the study area should be restricted to reduce potential impacts.
- Parker's comment that 'the application does not require amelioration' is questionable as it relies on the fact that the assessments undertaken have adequately assessed all potential direct and indirect impacts on threatened biodiversity.

6.1.12 SIS Supplementary Material (dated 14 June 2006)*Habitat maps*

Although the habitat maps for subject species have all been redone, very few of them address the comments regarding the underestimate of the extent of habitat. Additionally, many of the figures still don't include areas where previous records exist as potential habitat and there is still no distinction between potential and actual habitat or breeding and foraging habitat. Generally, the only addition to the habitat maps is the overlay of the development footprint.

Apart from the habitat maps for the Koala and Pied Oystercatcher, which have been amended appropriately, the same comments as those in Section 5.3.2.3 apply with respect to the habitat maps for Subject Species.

Description of the study area

For a description of vegetation types within the study area the supplementary report directs the reader to Section 4.7.1 and Figure 4.2 of the SIS. Although these provide the data required, they only provide it for the subject site and not the whole study area as requested in the DGRs. Vegetation maps, a more detailed

description of each vegetation community and the area (ha) of each vegetation community for the whole study area are required. The study area is well defined in Section 3.8 of the SIS (although subsequent information does not describe the whole study area): *The study area is the subject site and any additional areas which are likely to be affected by the proposal, either directly or indirectly. The study area also includes SEPP 14 (Coastal Wetland) areas adjacent to the proposed development, the Belongil Estuary, the Belongil Beach (Fig. 3.8), the Cape Byron State Conservation Area, the Cape Byron Marine Park and the Tyagarah Nature Reserve.*

Maps provided in the SIS do not meet the DGRs. The response provided in the supplementary report that the study area is too large or sections of it are too far from the subject site to map is inadequate. The problem of scale can be easily overcome using GIS.

The additional information provided in the supplementary SIS report regarding the vegetation and areas of the Cape Byron State Conservation Area, Tyagarah Nature Reserve and the Cape Byron Marine Park provides useful information to help the reader assess the ecological values of the whole study area. However, maps of these ecological values for the whole study area need to be provided, as requested in the DGRs. Additionally, more details of the ecological values within the study area should be provided and the description of land uses should be expanded to include the whole study area (simply providing maps copied directly out of other reports without any discussion is not sufficient).

Information on fire history within the study area provided in the SIS and supplementary SIS report is considered adequate.

The description of land zoning is unchanged in the supplementary SIS report. Although the description of land zoning is adequate within the subject site, it fails to discuss the whole study area (i.e. outside the subject site) as required in the DGRs.

Discussions of land tenure and any proposed changes, as well as the degree of protection this land tenure provides native vegetation and threatened species, is unchanged in the supplementary SIS report. The discussion of land tenure within the subject site is adequate, but again it fails to discuss the study area outside the subject site.

The response in the supplementary SIS to State Environmental Planning Policies (SEPP) does not address the issues. Although the SIS does mention the three SEPPs relevant to the subject site, it does not discuss the degree of protection they provide to native vegetation and threatened species within the study area, particularly outside the subject site. The SIS and supplementary SIS report assume that the reader is familiar with these SEPPs. However, this may not

necessarily be so and it is the function of the SIS to provide the relevant details of these SEPPs and how they relate to the study area, particularly how they function in respect to biodiversity protection.

The map of the asset protection zones in the supplementary SIS report is considered adequate, although a detailed discussion of the number and type of trees to be removed, if any, needs to be provided.

Affected species

Section 5.1 of the DGRs is not adequately addressed in the SIS or supplementary SIS report. To state that “no habitat will require removal” is probably untrue, although insufficient details of the impacts of the proposal are provided to be certain. As discussed in Section 5.5.2 of this report, the identification of affected species is inadequate.

In response to Section 5.2 of the DGRs (details of affected species) the supplementary SIS report claims that no subject species would be affected and therefore there is no need to provide details on any threatened species or EECs. As discussed in Section 5.5.2 of this report, it is considered likely that a number of plant and animal species and EECs would be affected by the proposal, mostly through increased human visitation. Additionally, a previous study by AMBS determined that a similar development would have a significant impact on the Wallum Froglet, and yet there is no justification given in the SIS as to why this species will not be affected, let alone significantly impacted, in this instance. As there are likely to be affected species, the SIS must comply with Sections 5.2 and 5.3 of the DGRs.

Assessment of EECs likely to be affected

The statement in the SIS and supplementary SIS report that EECs would not be affected by the proposal is not supported. EECs are expected to be indirectly affected through increased human visitation and other indirect factors such as rubbish dumping and firewood collection.

Ameliorative and compensatory measures

In response to this section of the DGRs (Section 7) the supplementary SIS report claims that no subject species would be affected and therefore there is no need to provide mitigation measures. The proponent admits themselves that impacts to threatened species are possible by noting that residents of the development would need to be educated about the sensitive nature of beach nesting bird species to prevent impacts to these species. As the proponent recognises that mitigation measures are required for some species, they must also discuss the impacts likely to those species.

6.2 Compliance with Policies and Strategies

6.2.1 DCP 18 - Becton Site and Adjoining Lands, Byron Bay

Section 7.5.10 of the SIS addresses DCP 18. Unfortunately it does not summarise adequately how the proposed development meets the requirements of DCP 18 and the reader is forced to search through the SIS and other numerous documentation to determine if those requirements have been met. Often the words of the DCP are paraphrased back to the reader, making one wonder whether the proposal does really meet with the requirements of DCP 18.

Important points/requirements from DCP 18 are presented below followed by a discussion of whether the proposal meets those requirements. However, it is often difficult to determine this from the information provided.

6.2.1.1 Section 2.1 Statement of desired future character

The site will be characterised by a mix of native bushland, coastal dune systems, wetlands and low intensity, low-rise and low scale tourist accommodation and ancillary uses. The integrity of native vegetation, wildlife habitats and waterbodies will be enhanced through active management and strategic revegetation. Natural areas will be separated from development by vegetated buffers and fire protection areas that are designed to minimize impacts on the integrity and quality of ecologically sensitive areas.

It is recognized that some areas of the site are intended for revegetation and that weed management in existing native vegetation has improved the ecological value of these areas, which is in keeping with DCP 18. However, with respect to buffers, it appears that only fire protection buffers are provided and that it will not be possible to vegetate buffers between the development and existing natural areas.

Ecologically sensitive wetlands, habitat and corridor areas, beaches and waterbodies that provide foraging and nursery areas for shorebirds and other conservation priority species. These areas also include an important habitat corridor adjoining the railway line, which is presently partly developed with holiday accommodation units but which provides a connective corridor between the Belongil Creek estuary and the Tyagarah Nature Reserve. These areas will remain in a natural vegetated undeveloped state and will be further revegetated over time.

The area referred to here is referred to as Lot 6 within the SIS figures. From the information provided in the SIS it is difficult to determine the future plans for Lot 6 as it is stated that “The area presently developed with holiday accommodation adjoining the railway line does not form part of the proposed

development”. The wording of DCP 18 suggests that Lot 6 should be revegetated, which would require the removal of the holiday units, although as the word “remain” is used it might be construed that it simply means that undeveloped areas within this corridor cannot be developed. However, to fully enhance this area as a wildlife corridor, the holiday units should be removed, non-native vegetation removed and the area revegetated. It does not appear that other areas between the railway line and Belongil estuary could be revegetated as these would be either part of the development area or Asset Protection Zones (referred to in the SIS somewhat misleadingly as environmental buffers). As it will not be possible to revegetate the APZs this requirement probably can’t be met in full.

Land that is to be revegetated adjacent to the coastal dunes should be extended south to join with the Belongil estuary vegetation to complete the connectivity in vegetation on the east side of the development. Additionally, the “cultural planting” along the road in the vicinity of Lot 6 is not in keeping with this requirement.

To ensure protection of native fauna species, no cats or dogs will be kept on, or brought to or through the site.

Although it is stated that cats and dogs will not be allowed on site, the Exotic Fauna Control plan needs to provide more details on how it intends to prevent neighboring residents from bringing dogs onto the site and how this will be policed.

Public pedestrian access to the beach will be provided and situated so as to avoid the shorebird nesting area and to respect coastal and dune system processes.

It is recognised that the two beach accesses through the Belongil estuary will be closed, which is in keeping with DCP 18. However, as one of these will be retained as an emergency beach access, more details are required to explain how illegal use of this access will be prevented.

Conservation and Habitat Protection

- *Sensitive areas are protected and enhanced*
- *Only those areas with low ecological value are used for tourism purposes*
- *The State And Regional significance of existing wildlife corridor values of the site are protected and enhanced*
- *The habitat of threatened or endangered terrestrial and aquatic species are protected and enhanced*

- *Potential impacts of habitat modification, interference with natural behaviours and exposure to human activities near natural areas are minimized*
- *Areas of ecological conservation values are identified and mapped in terms of their local or regional significance*
- *Significant areas of land are rehabilitated to provide compensatory habitat to offset past degradation*
- *Best-practice ESD principles are implemented*
- *Opportunities are provided for the involvement of local community groups in the rehabilitation process*
- *Sensitive land is secured for conservation in perpetuity*

Generally these points are met. However, the following issues need to be addressed:

- Wildlife corridors could be better enhanced as discussed above;
- Habitat for threatened species (particularly nesting shorebirds) and vegetation communities are likely to be negatively impacted, not enhanced, by increased human visitation to the site. A more robust discussion of the impacts, including changes in the number of visitors, and more detailed mitigation measures are required.

6.2.1.2 Section 3.1 Element – Coastal Habitat Precinct A

Generally these points are met. However, the following issues need to be addressed:

- Wildlife corridors could be better enhanced, as discussed above;
- The beach access structure needs to be discussed in more detail and management of illegal use of the Belongil estuary emergency access and unmade tracks need to be discussed;
- All points discussed in this report regarding the Dune Management Plan need to be addressed;
- Vegetation buffering of greater than 5 m of the wetlands would improve habitat for wetland birds and frogs;

- It appears that only fire protection buffers would be provided around existing native vegetation and not revegetated buffers as well, as required; and,
- The revegetation plan does not indicate that the current native vegetation within Precincts A and E would be re-connected, as required in DCP 18.

6.2.1.3 3.2 Element – Coastal Processes Precinct B

The SIS does not consider Precinct B as part of the development, so it is difficult to determine whether it meets with DCP 18. However, there is not intention to revegetated this area, except for the 5 m buffer around the wetlands, so the development would not “enhance wildlife corridor values in the precinct”.

6.2.1.4 3.3 Element – Western Wetland and Heath Precinct C

Generally these points are met. However, the following issues need to be addressed:

- On the southeast edge of this precinct it appears that only fire protection buffers would be provided around existing native vegetation and not revegetated buffers, as required.

6.2.1.5 3.4 Element – Southern Wildlife Corridor Precinct D

The proposed buffer along the waterway will help the proposal meet the requirements of this section. However, it does not appear that the area will be revegetated or that revegetated buffers would be provided. The discussion concerning Lot 6 above is relevant to this precinct.

An underpass beneath the road must be constructed to link Precincts C and D. This is not discussed in the SIS. Appropriate trees should also be planted on either side of the road between these two precincts to enhance fauna connectivity.

6.2.1.6 3.5 Element – Eastern Wetland and Littoral Rainforest Precinct E

Generally these points are met. However, the following issues need to be addressed:

- It appears that only fire protection buffers would be provided around existing native vegetation and not revegetated buffers, as required; and,
- The revegetation plan does not indicate that the current native vegetation within Precincts A and E would be re-connected, as required.

6.2.1.7 **3.6 Element – Seabird Habitat Precinct S**

It is recognised that the two beach accesses through the Belongil estuary will be closed, which is in keeping with DCP 18. However, as one of these will be retained as an emergency beach access, more details are required to explain how illegal use of this access will be prevented. This is an extremely sensitive issue and unless an effective Shorebird Management Plan can be provided, which prevents people from disturbing the shorebird breeding area, the development could possibly have a significant impact on threatened shorebirds. Unless the proponent is willing to acknowledge that the development would probably have potentially serious impacts to these species and design effective solutions to prevent those impacts, this section of the DCP will not be met. A shorebird Management Plan has not been provided.

6.2.1.8 **4.2 Element – Water body buffers**

As discussed throughout this report, some buffers around wetlands are not considered to be sufficient and the recommendations provided above should be addressed.

6.2.1.9 **6.2 Element – Environmental management plans**

The management plans referred to in this section of the DCP either need to be amended as discussed in this report (Vegetation Management Plan and Dune Management Plan) or have not been provided (Shorebird Management Plan). Although the proponent has identified Key Threatening Processes for some species, they fail to acknowledge that the development will increase those Key Threatening Processes or provide effective ameliorative measures to reduce the impacts.

6.2.2 **Other**

Other policies and strategies that have been inadequately considered in the SEE, Flora and Fauna Report and SIS in terms of information contained within them, targets and objectives, and strategies to meet targets/objectives. These policies and strategies include:

- SEPP 14 Coast Wetlands
- SEPP 26 Littoral Rainforest
- SEPP 71 Coastal Protection
- North Coast Regional Environmental Plan
- NSW Coastal Policy

- Byron Biodiversity Conservation Strategy
- Byron Coastal Management Policy
- Byron State of the Environment 2004
- Byron Bay, Suffolk Park and Ewingsdale LES and LEP
- DPIs Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings

7.0 RECOMMENDATIONS AND CONCLUSION

7.1 Recommendations

A number of recommendation have been made in this report. These are summarised below.

Statement of Environmental Effects

- Assessment of the hydrological impacts on waterbodies and wetlands resulting from changes to drainage regime within the subject site. In particular, hydrological impacts to SEPP 14 wetlands resulting from filling of the drain that runs north south through the site
- Assessment of impacts associated with increase numbers of people in relation to rubbish, noise, disturbance to species and/or their habitats, impacts on waterways and impacts on dunal areas.

Flora and Fauna Report

- Further information on the proposed development should be provided in the report
- A general impact assessment addressing potential impacts of the proposed development on flora and fauna occurring in the study area should be provided, addressing direct and indirect impacts and proposed mitigation measures
- TSC Act Eight Part Tests (under the TSC and FM Acts) need to be redone for threatened species and Endangered Ecological Communities (including those preliminarily listed) and their habitats, answering all relevant questions for each species/community separately
- EPBC Act Administrative Guidelines on Significance need to be addressed for threatened species and ecological communities known to occur and/or with potential habitat in the study area.
- The report abruptly ends on pg 4.10.108 without any recommendations or conclusion from the study. At a minimum a conclusion should be provided for the report
- Parker (2004) should provide more detailed information regarding structure and composition of vegetation communities present in the study area, including condition and any existing disturbances impacting the areas

- Adequate aquatic surveys and assessment by appropriately qualified and licensed aquatic ecologist should be undertaken
- Adequate consideration of threatened aquatic species under the FM and EPBC Acts is required

Species Impact Statement

- Detailed methods, effort, dates and maps showing areas surveyed should be provided for flora surveys
- A list of threatened species targeted during each of the flora surveys
- List of subject species should be expanded to include all threatened species with potential habitat in the study area. Alternatively detailed justification for not including such species should be provided. Expanded list of 'subject species' will then require an assessment of likely impacts and further assessment for those considered 'affected species'
- Assessments of likely impacts on each subject species and endangered ecological community needs to be provided in detail, taking into account direct and indirect impacts such as edge effects (particularly where the buffer zones are part of APZs), habitat loss and increased human usage of the site as well as those listed under Section 5 of the DGRs
- List of 'affected species' should be expanded to include all threatened species that could potentially be impacted by the proposed development, prior to consideration of reduce impacts as a result of mitigation measures. Further assessment of the impacts on each of these species and mitigation measures to reduce these impacts will then be required
- Section 5-7 of the DGRs should be addressed in detail following identification of affected species
- Adequate mapping of potential and known habitat

7.2 Conclusion

Biosis Research was engaged to undertake a critical review of flora and fauna documentation relating to the North Beach Byron development. The review of the Statement of Environmental Effects, Flora and Fauna Report and Species Impact Statement (as well as supporting documentation) raised a number of issues, including:

- Structure and layout of all reports, in particular the ecological reports, makes it difficult for the reader to assess the information contained within them.
- Information is not easily accessible within the report. Summaries of relevant information should be provided in all reports so that they can be read as stand alone reports. This is especially important for the SIS
- Considerable paraphrasing of legislation and policies is used without providing detail regarding how issues are addressed
- Inadequate detail provided regarding potential impacts of the proposed development
- Reports do not acknowledge that impacts will occur to ecological values
- Inadequate assessment of impacts on threatened species and communities, SEPP 14 wetlands, waterbodies
- Further detail required on mitigation measures
- Inadequate detail in management plans, plus need for Vegetation Management Plan

Based on our review, particularly of the SIS, it is considered that:

- Impacts will occur to threatened species and communities, wetlands and waterbodies
- A significant impact may occur to shorebirds known to breed in the area as there will no longer be a viable breeding area due to human disturbance caused by increased visitation to the North Beach Byron site
- SIS does not meet the DGRs because (at a minimum)
 - Inadequate assessment of subject and affected species
 - Inadequate mapping
 - Entire study area not considered in assessment
 - Inadequate assessment of impacts and mitigation/amelioration measures
 - Key sections (5-7) not addressed

FIGURES

Figure 1: Plan 3.4 Setback and buffers from the SEE

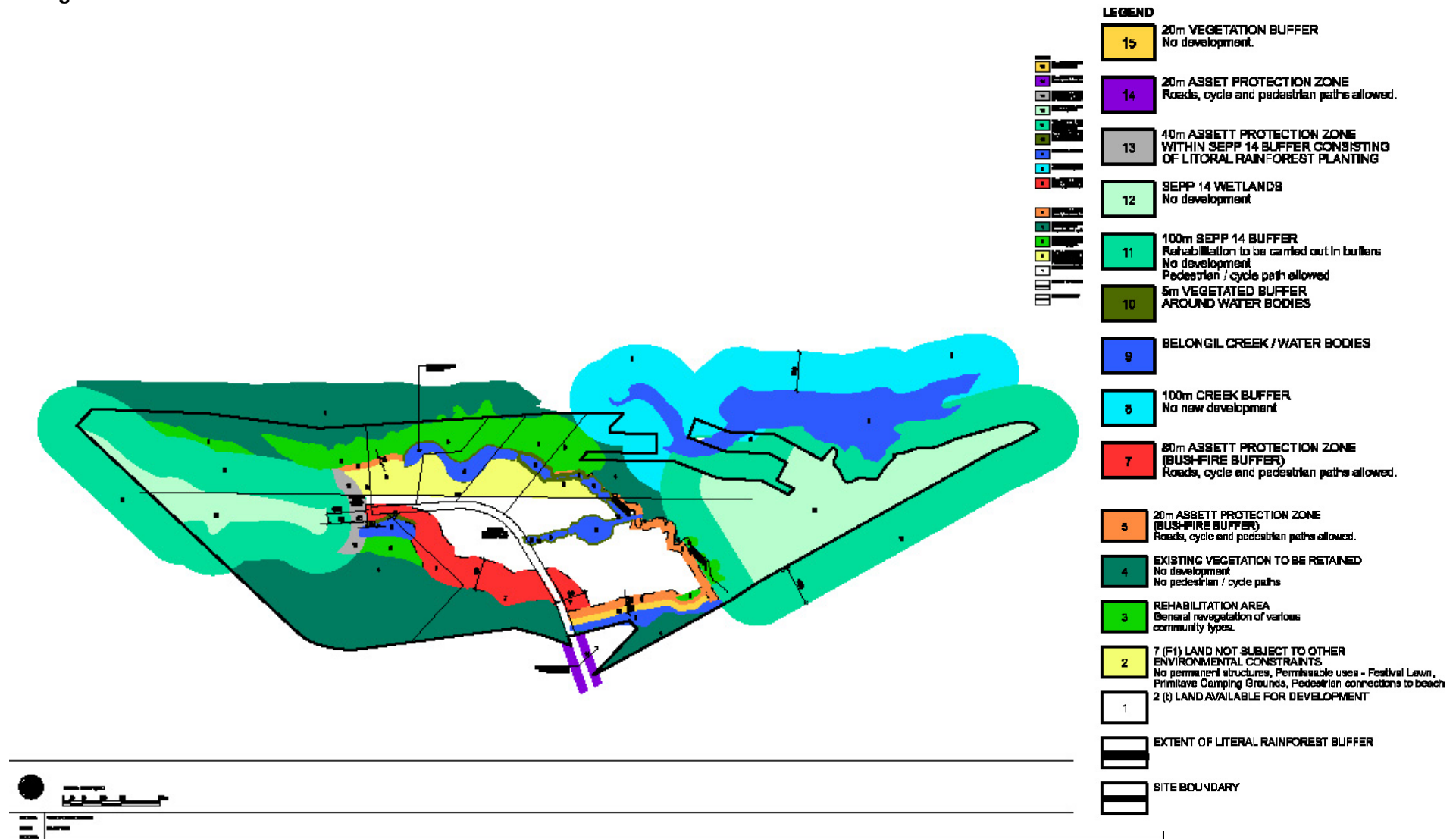


Figure 2: Plan 3.3 Illustrative Plan – Development Area from the SEE



Figure 3: Plan 2 Hotel Villa Illustrative Landscape Plan (updated 27 April 2006) include existing trees to be retained (bright green) and proposed new tree plantings (olive green)

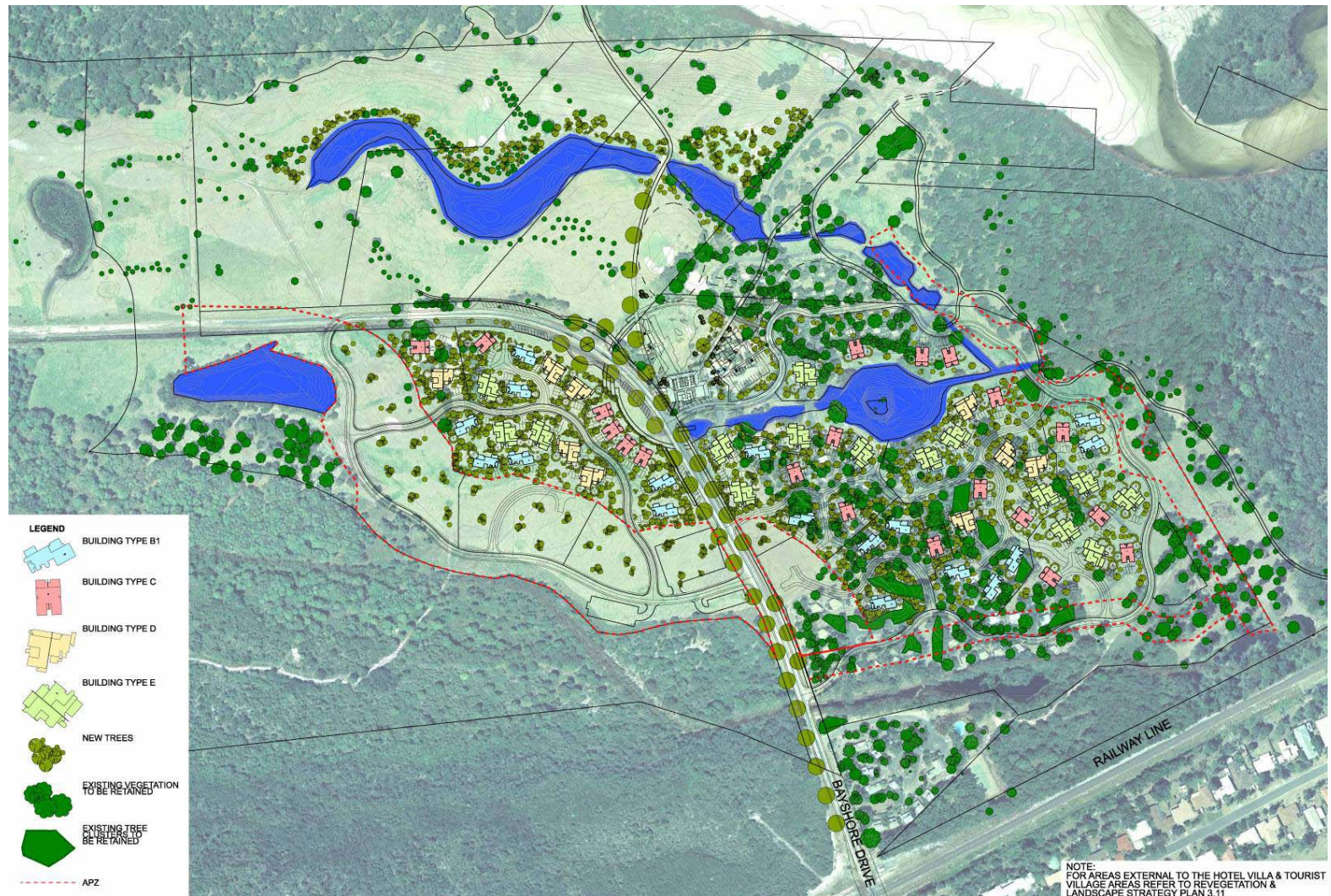
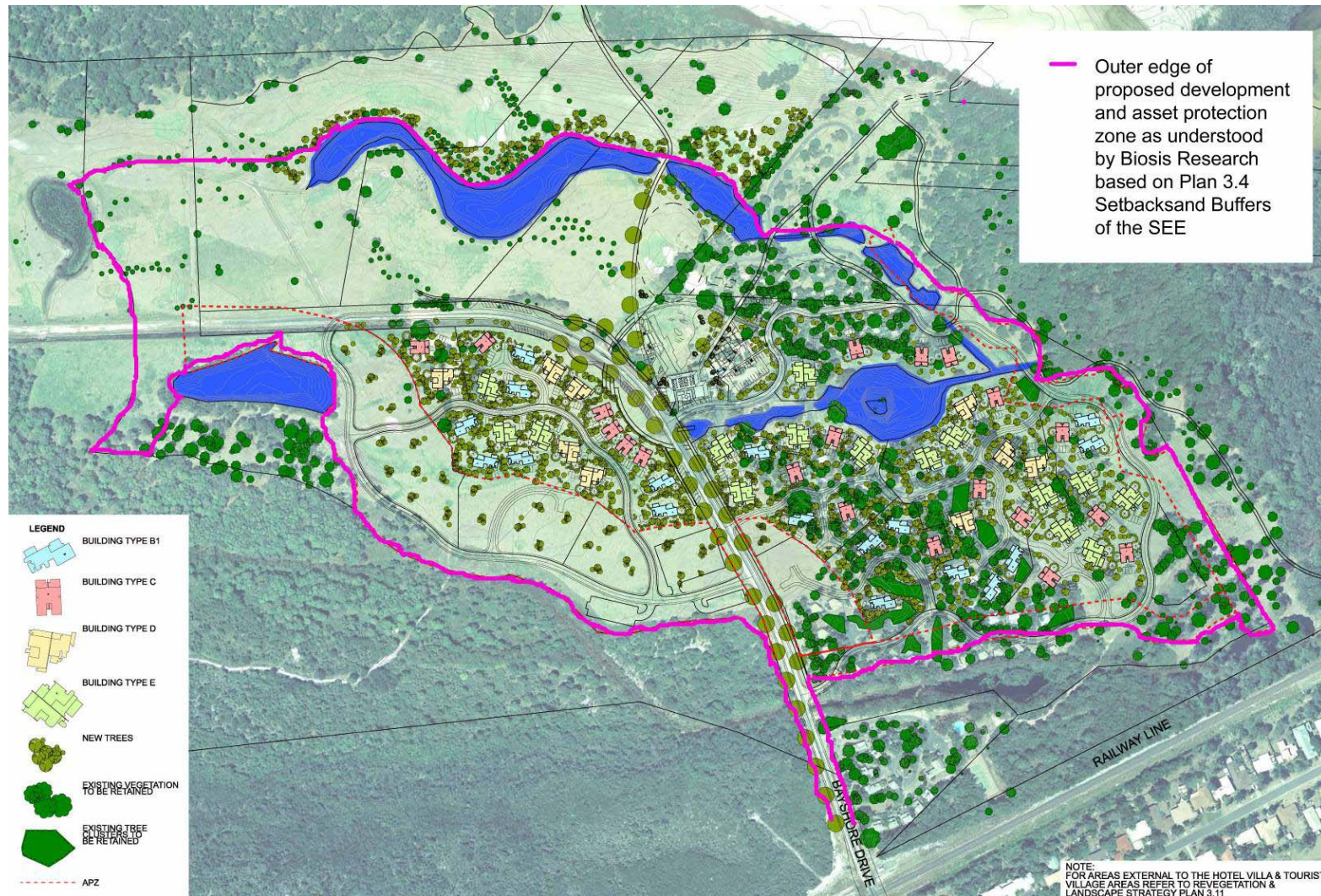


Figure 4: Biosis Research's understanding of where the outer edge of the proposed development/asset protection zone overlayed on Plan 2



APPENDICES

APPENDIX 1

A1. PROJECT BRIEF

Department of Planning

URBAN ASSESSMENTS

ASSESSMENT OF DEVELOPMENT PROPOSAL

CONSULTANCY BRIEF

DA 10-2-2006

1. Background and Purpose of the Consultancy

The Minister for Planning is the consent authority for a variety of developments throughout New South Wales. The Department wishes to appoint a consultant to undertake an independent ecological assessment of DA 10-2-2006 for a staged development proposal at North Beach, Byron incorporating a 117 key integrated tourist facility; environmental repair and the creation of a habitat conservation area.

2. The Work

The products of the consultancy for DA 10-2-2006 will be:

- a report on the Development Application, specifically the adequacy of the SIS;
- recommended conditions of consent as may be appropriate related to specific ecological/biodiversity elements of the proposed facility.

The tasks the consultant will need to undertake include:

- consideration of the Development Application in relation to its potential impact on flora and fauna in general and specifically on threatened species and endangered ecological communities. This is to include a review of the Flora and Fauna Report (2004) and Species Impact Statement (comprising Volumes 1, 2 and 3) prepared by Peter Parker Environmental Consultants Pty Ltd and the Statement of Environmental Effects as it relates to ecology;
- consideration of submissions received in response to the exhibition of the development application with respect to biodiversity/ecological issues;
- consultation with relevant officers of the Department's planning teams;
- meetings with Departmental officers and the Applicant, as required.

3. Available Information

The consultant will be provided with the following documents to assist with the assessment of each proposal:

- relevant documentation (as outlined in Section 2 above) comprising the subject Development Application.
- any submissions made to the public exhibition of Development Application.

4. Timing and reporting

The consultancy shall commence immediately.

A draft report is to be submitted to the Department for review within 3 weeks of formal commissioning.

A final report shall be completed within one week of receiving comments from the Department.

5. Product

The draft and final report is to be presented in the company's own format and be of a high standard and quality.

6. Payment

The consultant shall submit regular invoices to the Department of Planning for payment. Progressive payments can be claimed.

7. Copyright

Copyright ownership of all work arising out of or in respect of all documentation shall be vested in the Department of Planning from the date of the consultancy agreement.

8. Confidentiality

All work arising out of or in respect of this consultancy will remain confidential unless or until released by the Department of Planning.

10. Avoidance of Conflict of Interest

The consultant shall enter an undertaking that no actual or potential conflict of interest exist or is likely to arise in the performance of the work. The consultant will inform the Department if any such conflict of interest arises during the course of the project.

REFERENCES

REFERENCES

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