LAND and WATER CONSERVATION
NEW SOUTH WALES GOVERNMENT

Mr Ed Munday
Gulaptis & Smith Pty Ltd
PO Box 278
MACLEAN NSW 2463

Your Ref: 2930
Our Ref: em1584

Dear Mr Munday,

Emerald Waters - Proposed Development of Lot 2 DP 840016

Some functions previously managed by NSW Public Works have been transferred to the new Department of Land and Water Conservation. These include the policy, planning and granting administration functions for the Country Towns Water and Sewerage Program and the Coastal, Floodplain, Estuary, Waterways Infrastructure Development and Fishing Ports Programs.

With regard to your specific inquiry (Gulaptis & Smith's letter of 19 June, 1995 to NSW Public Works, Coffs Harbour Regional Office which was then forwarded to this Department), the following comments relating to estuary and coastal management issues and flooding aspects should be noted:

<u>Estuary Management Considerations</u>
The Department of Land and Water Conservation has statutory responsibilities under the Rivers and Foreshores Improvement Act (1948) to ensure the hydraulic stability of estuaries. As such, the Department's Coastal and Rivers Management Directorate is primarily interested in any works which may detrimentally affect Fiddamans Creek and SEPP 14 Wetland No.~~255~~ 318 upstream of the site.

The proposed works have the potential to adversely affect the estuary and its ecosystem and this Directorate requests that the following points be taken into consideration in the preparation of the Environmental Impact Study (EIS) for the development:

1. The impact of the development on the existing flora and fauna at the site;
2. The environmental impacts on water quality, habitat values and vegetation communities in the creek from the construction and habitation of the proposed development;
3. The proposed development should be planned in such a manner to minimise the amount of urban rubbish, sediment, and excessive nutrients entering into Fiddamans Creek through drains and stormwater channels;
4. A water quality assessment should be undertaken of the proposed artificial lake including flushing, stratification, algal blooms and the input of pollutants; and
5. Evidence that there are no acid sulphate soils on the site or that the environmental implications of encountering potential acid sulphate soils have been considered.

A Part 3A Permit will be required under the Rivers and Foreshores Improvement Act for any excavation or placement of fill within 40 metres of the top of the creek bank. An information

sheet on Part 3A Permits is attached. Should you have any further enquires please contact the Estuary Management Program, Ph: (02) 372 7727.

Coastal Management Considerations

The Department of Land and Water Conservation has not undertaken a detailed coastal process/hazard definition study for this section of coastline. Accordingly, definitive advice on the magnitude of coastline hazards affecting Emerald Beach cannot be given. However, the Department has completed a number of photogrammetric studies of beaches within the Coffs Harbour City area from which preliminary comments can be made.

The eastern boundary of the subject allotment is set back a minimum distance of 75 metres from the nominal back beach erosion escarpment along Emerald Beach. On this basis, it is considered unlikely that the above property would be affected by the coastline hazards of beach erosion, long-term shoreline recession, climate change and oceanic inundation within a nominal 50 year planning period.

Department of Land and Water Conservation officers are available to provide further advice in this regard if required.

Flooding Aspects

As indicated in the State Governments Floodplain Development Manual (1986) the principal objective of the State Government's Flood Policy is to reduce the impact of flooding and flood liability on individual owners and occupiers and to reduce private and public losses resulting from flooding. The management of flood prone land is primarily the responsibility of local government with the State Government's role principally being to assist local government with its management responsibilities by providing technical and financial assistance.

The Department of Land and Water Conservation has no readily available data on flooding or flood levels in this area. In the first instance, information on local flooding should be sought from Coffs Harbour City Council.

It is noted from the documents provided that :-

- The impact of the proposed development on existing flood behaviour is to be assessed in accordance with Coffs Harbour City Council's guidelines; and
- A preliminary flood study has been prepared for the area by consultants.

The abovementioned study has not been sighted by this Department.

As the proposed development is located near the mouth of Fiddamans Creek, flood investigations for the EIS should assess existing flood behaviour and the impacts on flooding from the proposed development based on the interaction between catchment runoff, elevated ocean levels and appropriate beach dune conditions. Such an assessment should have regard to the existing and likely future openings and/or blockages of the creek entrance due to coastal processes and/or maintenance of the entrance.

Any queries on this matter should be directed to the undersigned on Ph: (02) 372 7633.

Yours sincerely

C. Page

Chris Page 15-August-95
Environmental Co-ordinator
Coastal and Rivers Management

Our reference: 110.5351 GS:JS
Mr Sciffer (066) 40 1344
Your reference: 2930

Roads and Traffic Authority
Grafton Zone

R T A

Better Roads. Safer Roads. Saving Lives.

31 Victoria Street
Grafton NSW 2460
Telephone (066) 40 1300
Facsimile (066) 40 1301
PO Box 576
Grafton NSW 2460
DX 7610

Gulaptis & Smith Pty Ltd
Consulting Surveyors
Suite 1
247 River Street
MACLEAN NSW 2463

3 - NOV 1995

COFFS HARBOUR CITY COUNCIL. PROPOSED SUBDIVISION, LOT 2 PACIFIC HIGHWAY, EMERALD BEACH, ACCESS.

Dear Sir

I refer to your letter dated 29 March 1995 concerning access to the above development and apologise for the delay in replying.

You are advised that the Authority is not in favour of any more accesses to the highway due to the impact the existing ones are having on the highway's amenity.

If the proposed subdivision proceeds then the following matters require addressing:-

(i) Provision for a north - south corridor and internal road system to connect the residential areas so traffic does not have to use the highway for local trips.

(ii) All access should be from Fiddamon's Road.

(iii) Property setback and attenuation to provide for noise and landscaping.

(iv) Internal links for cyclists and pedestrians.

(v) Road network suitable for buses to circulate and pick up at formal laybys.

(vi) Traffic calming to improve the amenity and safety of the road system.

Yours faithfully

P J Collins
Zone Manager

Coffs Harbour City Council

Locked Bag 155
Coffs Harbour NSW 2450

Your Ref: 2502LCC3 CPC/bc
Our Ref: 244430 (96080)

3 July 1996

Mr Christopher Clark
Director
Clark Consulting Services Pty Ltd
P O Box 366
MACLEAN NSW 2463

Dear Sir

D7 Beach Protection Zone, Development Control Plan No. 1, Lot 2 DP 840016, Pacific Highway Emerald Beach

Reference is made to your letter in regard to the report prepared by Patterson Britton & Partners Pty Ltd (November 1995) identifying the Coastal Hazards & Appropriate Buffer Zone for the above property and your request for the appropriate rezoning of the land to occur.

As detailed in your letter, Council has accepted the technical adequacy of the report which demonstrates that a reduced buffer zone is appropriate in the circumstances.

Development Control Plan No.1., enables Council to permit other forms of development within the D7 Beach Protection Zone where it can be demonstrated by the applicant not to detract from the effectiveness of that purpose. No formal re-zoning of the land is required as the DCP is flexible enough to enable Council to approve of other forms of development within this zone, where considered appropriate.

A decision as to the reduction of the zoning would be made by Council in conjunction with the assessment of a development application for development of the land.

For further enquiries please contact Mr Ken Maguire (Phone 520.741) of Council's Strategic and Land Use Planning Branch.

Yours faithfully

Denis Smith
Director of Planning

Per:

KJM:de
ID517

Telephone: (066) 52 2555
Fax: (066) 52 1517
D.X.: 7559

PLEASE ADDRESS ALL COMMUNICATIONS TO
The General Manager

Administration Building
Castle Street,
Coffs Harbour 2450

Appendix B – DGR's from Department of Environment & Conservation (NP&WS)

20 October 2003

DAVID SHARPE.
66 203 815.
HOME. 66293 431.

NSW
NATIONAL
PARKS AND
WILDLIFE
SERVICE

ABN 30 841 387 271

Mr Paul Reid
Director
Pridel Investments Pty Ltd
19 River Road
PALMERS ISLAND NSW 2463

Our Reference:
Your reference:

tsu/mam/10242

FAXED

Dear Sir

DIRECTOR-GENERAL'S REQUIREMENTS FOR A SPECIES IMPACT STATEMENT FOR A PROPOSED RESIDENTIAL DEVELOPMENT LOT 2 DP 840016, PACIFIC HIGHWAY EMERALD BEACH

Please read these Director-General's requirements carefully – failure to comply with these requirements may render the Species Impact Statement invalid.

Thank you for your letter, received 22 September 2003, requesting the Director-General's requirements (DGRs) for a species impact statement (SIS) for the proposed development cited above. The Department of Environment and Conservation (DEC) understands that this proposal is for a proposed residential development at Lot 2 DP840016 Pacific Highway Emerald Beach in the Coffs Harbour Local Government Area.

You may be aware that the NSW Government established a new environment agency on 24 September 2003, the Department of Environment and Conservation, which incorporates the National Parks and Wildlife Service (NPWS). Responsibility for development assessment matters now rests with the Environment Protection and Regulation Division (EPRD) of the DEC rather than the NPWS. Accordingly, the new arrangements will be reflected in this letter.

The DGRs provided below apply only to any initial application for the above proposal. Any intensification of the proposal, as provided to the DEC (1 October 2003), may require additional survey effort to be undertaken and additional ameliorative measures to be provided.

The Species Impact Statement

The purpose of a SIS is to:

- allow the applicant or proponent to identify threatened species issues and provide appropriate amelioration for adverse impacts resulting from the proposal;
- assist consent and determining authorities in the assessment of a development application under Part 4 or request for Part 5 approval under the *Environmental Planning and Assessment Act 1979* (EP&A Act);
- assist the Director-General of the Department of Environment and Conservation in deciding whether or not concurrence should be granted for the purposes of Parts 4 or 5 of the EP&A Act;

Conservation
Programs and
Planning Division
Northern Directorate
GIO House
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2450 Australia
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Head Office
43 Bridge Street
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Hurstville NSW
2220 Australia
Tel: (02) 9585 6444
Fax: (02) 9585 6555
www.npws.nsw.gov.au

- assist the Director-General of the Department of Environment and Conservation or the Minister for the Environment when consulted for the purposes of Parts 4 or 5 of the EP&A Act; or
- assist the Director-General of the Department of Environment and Conservation in the assessment of Section 91 Licence applications lodged under the *Threatened Species Conservation Act 1995* (TSC Act).

Sections 109 and 110 of the TSC Act describe the form and content of a SIS. Pursuant to Section 111(3) of this Act, I have limited and modified the form and content of the SIS and provided additional matters to be addressed, as described below. The matters listed in sections 109 and 110 of the TSC Act have been incorporated into the DGRs provided below.

The DGRs have been designed to assist presentation of information concerning threatened species and ecological communities impact assessment associated with the proposal in a logical and sequential manner including:

- a description of the subject proposal;
- a description of the threatened species values of the study area;
- an assessment of the potential impact of the proposal on identified threatened species values;
- consideration of measures to ameliorate or avoid identified impacts on threatened species values;
- assessment of the significance of potential impacts of the proposal unable to be ameliorated;
- consideration of alternatives to the proposal to minimise identified impacts on threatened species values; and
- justification for the proposal with regard to biophysical, economic and social considerations and the principles of ecologically sustainable development.

Section 111 (1) of the TSC Act states that an applicant must comply with the DGRs concerning the form and content of the SIS. **Failure to do so may result in the Department of Environment and Conservation being unable to issue concurrence to the development consent.** Accordingly, the SIS **must** be formatted to follow the sections and subsections provided and contain the detail requested in the section/sub-sections in these DGRs.

Definitions

The definitions given below are relevant to these requirements:

- ***abundance*** means a quantification of the population of the species or community.
- ***affected species*** means subject species likely to be affected by the proposal.
- ***consent*** has the same meaning as in the EP & A Act.
- ***conservation status*** is regarded as the degree of representation of a species or community in formal conservation reserves; it also takes into account the degree and type of threatening process affecting the species or community, and its range and abundance both within and outside reserves. The provision of information on "conservation status" is not satisfied by reference to the schedule category that the species or community is listed in under the TSC Act.
- ***DEC*** means the Department of Environment and Conservation
- ***development*** has the same meaning as in the EP&A Act.
- ***Director-General*** means the Director-General of the Department of Conservation and Environment.
- ***locality*** means the area within a 5 km radius of the study area.

- ***native plant*** has the same meaning as in the *National Parks and Wildlife Act 1974* (NP & W Act).
- ***NPWS*** means the NSW National Parks and Wildlife Service.
- ***proposal*** means the development, activity or action proposed.
- ***protected fauna*** has the same meaning as in the NP & W Act.
- ***proponent*** has the same meaning as in the EP & A Act.
- ***region*** is as defined in the "Interim Biogeographic Regionalisation for Australia" map and report.
- ***significant species*** means species not listed in the TSC Act but considered to be of regional or local significance.
- ***study area*** is the subject site and any additional areas which are likely to be affected by the proposal, either directly or indirectly.
- ***subject site*** means the cadastral area that is proposed for development/activity, including areas being retained for conservation or as amelioration to impacts.
- ***subject species*** means those threatened and significant species, populations and ecological communities that are known or considered likely to occur in the study area.
- ***threatening process*** has the same meaning as in the TSC Act; the definition is not limited to key threatening processes.

All other definitions are the same as those contained in the TSC Act.

Matters which have been limited or modified

Pursuant to Section 111(3) of the TSC Act, the form and content of some SIS requirements have been limited or modified. The Director-General has limited or modified the following Section 110 matters:

- All reference to critical habitat. There is currently no declared critical habitat in NSW of relevance to this proposal. Therefore, it is considered that the SIS for the proposal need not address critical habitat.
- All matters raised in Section 110 of the TSC Act have been clarified by the requirements below.

Matters to be addressed

The SIS must address all the matters specified in Sections 109 and 110 of the TSC Act, with the exception of those matters limited or modified above. The requirements outlined in Sections 109 and 110 (excluding the matters limited or modified above) are detailed below, together with the specific DGRs for your proposal.

1. Form of the species impact statement

1.1 *A species impact statement must be in writing (Section 109 (1))*

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))*

It is a statutory requirement that the SIS be signed by the applicant for the development consent of the proposal, the DEC will assume that the applicant is aware of and will support the inclusion in the development application of any avoidance, ameliorative or

compensatory measures contained in the SIS. 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.

The SIS must follow the headings in these Director-General requirements and provide the content required under those headings.

A copy of the SIS, together with all relevant maps and appendices shall be provided to the Director-General in electronic form (preferably CD), in addition to the hard copies of all relevant documents.

In discussing the impacts of the proposal and the proposed mitigating 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 should 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. Numeric figures are to be used to quantify habitat loss, habitat replacement, area of habitat, amount of habitat features etc.

2. Contextual information

2.1 Description of the proposal and study area

2.1.1 Description of the proposal

A species impact statement must include a full description of the action proposed, including its nature, extent, location, timing and layout (Section 110 (1)).

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 not be restricted to, the type of auxiliary infrastructure such as installation and maintenance of utilities (eg sewerage, water, power etc) and the location of any auxiliary infrastructure, walking tracks, fences, fire protection zones and access and transport routes. Details of any likely changes in surface water flows or proposed earthworks are to be provided. 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.

2.1.2 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 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 likely, or anticipated, extent of the identified indirect impacts must be included in the study area.

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.

The following features are to be included in the study area: SEPP 14 Coastal Wetland number 30, Fiddamans Creek, Fiddamans Beach, the beach between Dammerels Head and Diggers Point, and the Crown Reserve adjacent to the subject site (now Regional Park).

2.1.3 Description of SIS study area

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.
- 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.
- 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.
- 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 in the study area and the locality.
- The land tenure and any proposed changes (eg 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.
- State Environmental Planning Policies (eg 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 in the study area.

2.2 Provision of relevant maps, plans and photographs

A topographic map of the 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 or usage of this land.

A summary plan of the subject site shall be provided at an approximate scale of 1:6000 that details the location of the proposal and location of works on site. This plan is to provide the location of sewerage and water pipelines, powerlines, fire management zones, fences, walking tracks etc.

A copy of this plan shall also be provided as a clear overlay at the same scale as the summary vegetation map to enable it to be laid over the vegetation map to clearly indicate location of impacts.

Fire management zones are to be mapped as per the requirements in the "Planning for Bushfire Protection" Guidelines (2001) and the *Rural Fires and Environmental Assessment Amendment Act 2002*.

A summary vegetation map of the study area shall be provided at an approximate scale of 1:6000. This map will show the location and type of vegetation communities present within the study area. An additional map is to provide the location of all flowering *Banksia* plants on the subject site. 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. **Additional consideration is to be given to the classification used in the Coffs Harbour City Council's Vegetation Strategy (on exhibition until 21 November 2003). The vegetation units in the Vegetation Strategy are to be confirmed on the ground for the subject site.**

A map of the locality, showing any locally significant areas for threatened species and ecological communities such as 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. A recent aerial photograph (preferably colour and at a scale comparable to the summary plan) of the locality (or reproduction of such a photograph) shall also be provided, if possible. This aerial photograph should clearly show the subject site and the scale of the photograph.

2.3 Land tenure information

Information about the land tenure across the study area shall be provided. Any limitations to sampling across the study area (eg, denied access to private' land or difficult topography or vegetative access) shall be noted.

3 Initial assessment: identifying subject species, populations and ecological communities

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).

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:

- the vegetation communities present within the study area;
- the presence, quantity, quality and degree of fragmentation of likely habitat for individual threatened species;
- recent (within the last twenty years) records of threatened species, populations and ecological communities in the locality;
- records of threatened species, populations and ecological communities from studies on the adjacent Crown Reserve, Moonee Beach Nature Reserve, the Moonee Beach NR Plan of Management.
- the known range of threatened species, populations and ecological communities.

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.

The following species shall be considered for inclusion in the list of subject species:

Threatened Species

Flora:
**Zieria prostrata*
**Sophora tomentosa*
**Chamaesyce psammogeton*
Quassia sp. *B* (Moonee Creek)
Phaius australis
Phaius tankervilliae

Fauna:

Frogs	
**Crinia tinnula*	Wallum Froglet
**Litoria olongburensis*	Wallum Sedge Frog
Reptiles	
Hoplocephalus stephensii	Stephens' Banded Snake
Hoplocephalus bitorquatus	Pale-headed Snake
Cacophis harriettae	White-crowned Snake
Chelonia mydas	Green Turtle
Caretta careeta	Loggerhead Turtle
Dermochelys coriacea	Leathery Turtle
Birds	
Amaurornis olivaceus	Bush Hen
**Grus rubicundus*	Brolga
**Burhinus grallarius*	Bush Stone-curlew
**Ixobrychus flavicollis*	Black Bittern
**Ephippiorhynchus asiaticus*	Black-necked Stork
**Sterna albifrons*	Little Tern
**Haematopus longirostris*	Pied Oystercatcher
**Haematopus fuliginosus*	Sooty Oystercatcher
Ninox strenua	Powerful Owl
Ninox connivens	Barking Owl
**Tyto capensis*	Grass Owl
**Tyto novaehollandiae*	Masked Owl
**Tyto tenebricosa*	Sooty Owl
**Lathamus discolor*	Swift Parrot
**Xanthomyza phrygia*	Regent Honeyeater
**Calyptorhynchus lathami*	Glossy-Black Cockatoo
**Pandion haliaetus*	Osprey
**Lophoictinia isura*	Square-tailed Kite
Monarcha leucotis	White-eared Monarch
**Coracina lineata*	Barred Cuckoo-shrike
**Todiramphus chloris*	Collared Kingfisher
Climacteris picumnus victoriae	Brown Treecreeper
Pomatostomus temporalis temporalis	Grey-crowned Babbler
Melithreptus gularis gularis	Black-chinned Honeyeater
Mammals	
Planigale maculata	Common Planigale
**Phascolarctos cinerius*	Koala
**Phascogale tapoatafa*	Brush-tailed Phascogale
**Petaurus norfolcensis*	Squirrel Glider
Petaurus australis	Yellow-bellied Glider
Pseudomys gracilicaudatus	Eastern Chestnut Mouse
**Syconycteris australis*	Common Blossom-bat
**Kerivoula papuensis*	Golden-tipped Bat
**Miniopterus schreibersii*	Common Bent-wing Bat
**Miniopterus australis*	Little Bentwing Bat
Scoteanax rueppellii	Greater Broad-nosed Bat
Mormopterus norfolkensis	Eastern Freetail-bat
Chalinolobus nigrogriseus	Hoary Wattled Bat
Nyctophilus bifax	Eastern Long-eared Bat
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat
Myotis adversus	Large-footed Myotis
**Pteropus poliocephalus*	Grey-headed Flying-fox
Pteropus alecto	Black Flying-fox

Invertebrates
Argyreus hyperbius Laced Fritillary Butterfly
including the larval food plant (*Viola betonicifolia*)

Endangered Population
Dromaius novaehollandiae Emu Population in the NSW North Coast Bioregion

Endangered Ecological Community
Lowland Rainforest on Floodplain in the NSW North Coast Bioregion

Particular attention is to be paid to the asterisked (*) species, populations and ecological communities and to the development of avoidance, amelioration and compensatory measures for them.

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 determining subject species that are listed above. In particular, threatened species that are cryptic or mobile or little surveyed for (eg bats), or some combination of the three, and for which the study area provides suitable habitat that falls within the species' range, must **not** be excluded solely on the basis of a lack of records in the locality. Furthermore, threatened species that occur in a range of habitats must **not** be excluded on the basis that their core habitat, or that all components of their habitat, is not present in the study area or locality.

Where a species, population or ecological community has been excluded from further consideration, this level of assessment allows the DEC to make informed decisions about whether additional information is required eg about a species, or whether additional mitigation measures should be proposed for a species by the applicant.

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 SIS are also relevant.

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 2, prior to undertaking the SIS to determine whether the DEC considers that it is appropriate and complies with the Director-General's requirements.

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.

Surveys are to be undertaken by appropriately experienced persons. Species of taxonomic uncertainty shall be confirmed by a recognised authority, such as the Australian Museum or National Herbarium at the Royal Botanic Gardens, Sydney.

As a minimum, survey methods for subject species and ecological communities must follow those detailed in Appendix 2, unless justification for variation from these methods can be provided to the satisfaction of the DEC. 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.

The minimum survey effort, as defined in Appendix 2, 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, and where considered appropriate that additional survey is undertaken. Further survey may be required to adequately cover the areas of suitable or potential habitat for a particular subject species on the site. 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 site.

Once a species is detected or ecological community is identified on the site further survey effort is likely to be required to understand the distribution of the threatened species and ecological community on 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.

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 to ensure appropriate ameliorative measures are developed.

4.2.1 Description of survey techniques and survey sites

Survey techniques must be described and a reference given, where available, outlining the survey technique employed. Specific subject species targeted by each survey technique must be listed. The habitat in which the survey was undertaken is to be provided. This includes the micro- and macro-habitat characteristics.

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 grid 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 2. 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, eg, vegetation type.

4.2.2 Documenting survey effort

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.**

Environmental conditions must be recorded at the beginning of each survey technique and any variation during the survey should be noted.

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.

The SIS must include a table showing compliance or otherwise with the survey effort outlined in Section 4.1 and Appendix 2.

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 definitely identified by the survey personnel or both (eg, Anabat, hair tubes, scat analysis and plant specimens) must also be provided.

4.3 Survey results

4.3.1 Subject species survey results

All occurrences of subject species identified in the study area must be recorded, 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 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.

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. 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.

4.3.2 General species survey results

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 the 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.

4.3.3 Ecological community survey results

The relevant information gathered using required survey effort (Appendix 2) 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 subject site.

4.4 Subject species and ecological community habitat mapping

Discrete areas identified as known or potential habitat 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 previous maps and are to include any point locality records of the relevant subject species and ecological communities in the study area (including previous records such as Atlas of NSW Wildlife records and records from the SIS survey).

Quantification of 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. 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. At a minimum, 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, eg as foraging, roosting, nesting etc.

5. Assessment of likely impacts on threatened species

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)).

This section is to be addressed for those threatened species that are likely to be affected by the proposal.

Assessment must consider indirect as well as direct impacts. It must also incorporate the likely and potential impacts of associated activities in the study area including, but is not restricted to:

- vegetation clearance on habitat fragmentation, edge effects, vegetation corridors;
- installation and maintenance of buildings and utilities, in particular sewerage and water pipelines, powerlines, fences, walking tracks etc;
- fire management, including construction and maintenance of asset protection zones;
- construction and utilisation of access and transport routes;
- increased visitation pressure on headland vegetation and adjacent reserves;
- changes to noise levels and types of noise;
- changes to lighting;
- increase in numbers of people, domestic pets and road traffic;
- changes in surface and sub-surface water flows; and
- changes to water quality, including stormwater run-off and pollution.

These actions or impacts may occur on or off the subject site.

In addressing the Koala in the following sections, the Coffs Harbour City Koala Plan of Management is to be considered.

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 details provided:

- 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 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.

- 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.

- 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:

    - achieve minimum fuel at ground level that could be set alight by fire,

    - avoid having any vegetation in the IPA that provides a path for the transfer of fire to the development,

    - avoid shrubs and trees overhanging or touching buildings and they must not form a continuous canopy,

    - ensure shrubs and trees are not of a species that retains dead material or deposit excessive quantities if ground fuel in a short period or a danger period, and

    - 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.

- 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.

- 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. This information is to be provided, including additional detail of the slope variation on the subject site and adjacent land is also to be provided,

- The Planning for Bushfire Protection guidelines require all APZ to be fully contained within the property boundaries. Confirm whether 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,

- 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,

- 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 trimming, thinning or clearing or a combination of these is proposed. Provide details of the timing, season and frequency that the proposed action is to be undertaken,

- Provide a copy of the relevant part of the Rural Fire Service's bush fire prone land map for the study area,

- 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, and therefore management burns for conservation purposes are likely to be compromised,

- Consideration to the Bushfire Environmental Assessment Code if it is gazetted prior to the completion of the SIS, and

- Any additional requirements of the Rural Fire Services are to be included.

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.

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))

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. The assessment process must incorporate survey results, habitat mapping, identification and analysis of likely impacts, and any other relevant information. An "affected" species is not necessarily a species that is determined to be significantly impacted upon by the proposal. Therefore, a threatened species may still be affected by the proposal and must be considered further in this and following sections of the SIS.

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.

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.

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. The reasons for the exclusion of any species or populations must be justified. The remaining requirements in Section 5 must be addressed for those species or populations determined as being affected by the proposal.

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 should include identification and discussion of:

- the likely impacts of the proposal and relevant key threatening processes on each affected subject species' conservation status, particularly at the local scale;
- 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

- the information provided in relevant recovery plans, and how it, particularly proposed actions, may contribute to reducing the impacts of the proposal.

In addition, assessment should include reference to the threatening processes which are generally accepted by the scientific community as affecting the species or population and are likely to be caused or exacerbated by the proposal.

Assessment should also include reference to any approved or publicly exhibited draft recovery or threat abatement plans (See Appendix 1) which may be relevant to the proposal.

5.3 Discussion of local and regional abundance

An estimate for the local and regional abundance of those species or populations (Section 110 (2)(d))

5.3.1 Discussion of other known local populations

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):

- the population size using either relative or absolute measures of abundance and the extent in hectares of each population;
- their locations, relative to each other, and depicted on a map;
- the age and sex structure of each population;
- 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;
- an indication of the degree to which the size and structure of the population of each species would be affected by the likely impacts of the proposal.

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.

5.3.2 Discussion of habitat utilisation

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.

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.

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.

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):

- measures of abundance (in order of preference: quantitative, semi-quantitative or qualitative);
- the distribution pattern of the abundance; and
- a determination of the conservation significance of the study area with respect to regional abundance.

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.

5.4 Assessment of habitat

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))

In undertaking the assessment for this section, the Coffs Harbour Vegetation Strategy and accompanying documents (on exhibition until 21 November 2003) are to be considered.

5.4.1 Description of habitat values

The value of the study area for lifecycle stages of the affected species shall be identified and discussed. This is to include discussion of specific areas and resources within the study area utilised or potentially utilised by subject species for specific habitat requirements eg breeding, roosting, feeding, foraging etc.

Specific habitat features identified in the study area and subject site, such as the stags, hollow bearing trees, culverts, rock shelters, 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 etc) shall be described. This is to include details of the location, frequency and evidence of use of the habitat features. 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 and in the study area is to be provided.

The condition of the habitat within the study area 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;
- 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
- resilience assessment - the potential for regeneration from either the soil seed bank in those disturbed areas or the likelihood of recolonisation from adjacent vegetation.

Details of the subject site's fire history (eg frequency, time since last fire, intensity) and the source of fire history (eg observation, local records) shall be provided.

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, based on:

- areas identified for development (using the Coffs Harbour City LEP); and

- areas for which development consents have been granted or proposed or proposed actions approved but which have not yet been developed.

The amount of vegetation to be removed modified 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 treatment plant, pipelines) and qualified (in terms of use). The maps referred to in section 4.4 must be used.

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.

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 eg (foraging, roosting, nesting etc).

6. Assessment of likely impacts on endangered ecological communities

A general description of the ecological community 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)). 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)).

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.

Assessment must consider indirect as well as direct impacts. It must also incorporate the impacts of associated activities in the study area 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;
- installation and maintenance of buildings and utilities, in particular sewerage and water pipelines, powerlines, carports, lawns, fences, walking tracks etc;
- fire management, including construction and maintenance of asset protection zones;
- construction and utilisation of access and transport routes;
- increased visitation pressure on headland vegetation and adjacent reserves;
- changes to noise levels and types of noise;
- changes to lighting;
- increase in numbers of people, domestic pets and road traffic;
- changes in surface and sub-surface water flows; and
- changes to water quality, including stormwater run-off and pollution.

Impacts to endangered ecological communities for the purpose of fire management consideration is to be given to the requirements in Section 5.

These actions or impacts may occur on or off the subject site.

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)).

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. "Affected" does not refer to a significant impact.

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) 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.

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.

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 in Section 6 must be addressed for those ecological communities still determined as affected by the proposal.

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):

- the extent in hectares of each endangered ecological community;
- their locations, relative to each other and depicted on a map;
- the time since last fire at each location;
- 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;
- 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
- the tenure and long term security of other localities.

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.

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.

6.2.2 Discussion of corridor values

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.

6.2.3 Discussion of regional significance

Information and a discussion of the regional abundance of each affected threatened ecological communities must be provided. This must include (unless stated that it is not available):

- the area occupied by the ecological community;
- the distribution pattern of the ecological community; and
- a determination of the conservation significance of the study area with respect to regional abundance.

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 threatened species ie 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.

6.3 Assessment of habitat

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)).

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.

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.

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.

7. Ameliorative measures

7.1 Description of ameliorative 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))

Ameliorative measures must be considered and discussed for each affected species and ecological community not just those assumed by the proponent or consultant to be significant. If a species or population will or potentially will be impacted or affected by the proposal, actions must be prepared to mitigate them.

Measures proposed to address the impacts of the proposal must be developed using the following approach:

- step 1: where possible, AVOID (eg eliminate option, locate elsewhere) 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.

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.

Additional measures directed toward the conservation of threatened species or populations may be proposed. Benefits from the proposed ameliorative measures to non-affected and threatened species not detected during the surveys should also be provided. Measures may include, but are not limited to:

- fire, pest and weed management;
- sediment and pollution control;
- habitat creation, rehabilitation or enhancement;
- translocation – as a welfare of individual/s management issue;
- increased protection (through changes in land tenure or zoning, or the application of other planning instruments etc) of areas of high conservation significance;
- facilitating movements of wildlife;
- actions addressing specific stages (eg pre-construction, construction, occupation) and actions of the proposal; and
- compensatory strategies.

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.

Should the SIS contain irrelevant and inadequate ameliorative measures, the DEC is likely to request additional information, thereby delaying the assessment of the proposal.

The information presented in the preceding section must be provided within the framework of a draft management plan for all affected subject species and ecological communities. Measures presented in this section of the SIS must only be included where the proponent agrees 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. This draft management plan is to include the:

- rationale for the management (the need for ameliorative/ mitigative/compensatory measures to be implemented);
- management objective (what the measure is trying to achieve);
- 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);
- 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);
- corrective action that will be taken if necessary (determined from results of monitoring);
- criteria to determine the success of management (these must be specific and measurable); and
- reporting requirements.

Should the DEC decide to grant concurrence to the proposal, if requested by Council, a condition of the concurrence would be the implementation of the Draft Management Plan for the Threatened Species and Ecological Communities for the proposed development.

Measures to be undertaken, in association with ancillary works, such as water quality (stormwater and sediment) and water quantity must be provided. 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, eg sedimentation fences placed at appropriate locations and maintained accordingly may benefit threatened species using the study area.

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 post-construction 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.

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.

Water quality

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 and sedimentation traps etc, including the standards they will be required to adhere to,
- the parameters of weather conditions when construction activity will not be undertaken,
- the design of stormwater management infrastructure to control ongoing post-construction stormwater impacts eg, 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,
- the location and timing of monitoring checks eg discharge zones will be monitored
  - weekly during construction and for 3 months post-construction,
  - monthly for 2 years after the first 3 months post-construction, and

- within 24 hours of rainfall events, emergency checks are required, regardless of the stage of the development.
- plant species that are recommended as suitable for planting in stormwater treatment areas, and
- 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.

Water quantity

Details to be provided of how water quantity to the adjacent habitats will be maintained. To maintain habitat for threatened species the following criteria must be achieved:

- no reduction in the amount of water entering the adjacent habitat as a result of stormwater or sediment management or road design,
- water flows are to be spread naturally and dispersed across the site ie not concentrated to a single outpoint or few outpoints, and
- stormwater flows are to mimic as closely as possible natural predevelopment patterns in terms of frequency, quantity and quality.

The location and timing of the monitoring checks is to be provided. Monitoring is to occur:

- during rainfall events; and
- within 24 hours of rainfall event, regardless of the stage of the development.

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.

The DEC will provide to the consultant an example of the detail expected in the management plan for this section upon request.

7.1.1 Long term management strategies

Consideration shall be given to developing long term management strategies to protect areas within the study area which are of particular importance for the threatened species or endangered ecological communities likely to be affected. This may include proposals to restore or improve habitat on site where possible, maintenance of wildlife corridors, fire management.

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.

Any strategies presented here are to be incorporated into the Draft Management Plan identified in Section 7.1 above.

7.1.2 Compensatory strategies

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.

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.

More than one compensatory strategy may be outlined if considered appropriate. Compensatory strategies may involve, but are not limited to:

- translocation of the threatened species, populations or ecological communities;
- provision of lands containing habitat(s) of high conservation value (with the same or similar ecological values) to be purchased and subsequently owned or managed or both, by organisations with appropriate conservation management expertise, preferably the DEC;
- identification and implementation of measures to improve habitat(s) of high conservation value (with the same or similar ecological values); and
- 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.

Any compensatory proposal will outline the desired outcomes and implementation mechanisms. Proposed compensatory and ameliorative measures will preferably have been trialed 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.

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.

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.

Any strategies presented in this section are to be incorporated into the Draft Management Plan identified in Section 7.1 above.

Translocation

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).

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 *et al.* 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 *et al.* 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).

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.

All translocation proposals for threatened flora must follow the Australian Network for Plant Conservation's (1997) translocation guidelines, 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 (Gann & Gerson 1996);
- 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 mitigating 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;
- aim to ensure no net loss of the species or its habitat occurs;
- allow for the maintenance of genetic integrity and effective genetic processes;
- 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 eg 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;
- include the criteria that must be used to determining whether a translocation project is successful. The minimum criteria for ameliorative or compensatory translocations must be that: 1) the colony contains sexually mature individuals and displays evidence of recruitment, and 2) that those recruits (the second generation) are capable of producing viable offspring; and
- ensure mitigation sites are protected and managed in perpetuity as exotic species and human-induced disturbances will continue to affect the translocation project (Gann & Gerson 1996).

Compensatory Habitat

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.

7.1.3 Ongoing monitoring

Any actions or measures proposed to avoid, mitigate 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 monitoring program is to be relevant to the reasons for the monitoring. If there are flaws in the design of the monitoring program, the results may be misleading and statistically meaningless, and in a worst case, could result in the extinction of the population. The monitoring program is to:

- be designed to detect changes with an acceptable level of precision,
- be clearly described that other people may continue the monitoring program,
- be undertaken so that data is collected over a meaningful time period to detect changes or long-term trends,
- include short term (first five years) and long-term monitoring (beyond five years),
- determine the effectiveness of the threat management proposed, such as habitat restoration (including weed removal) and stormwater run-off and management,
- detect changes to the site in relation to the composition and structure of the ecological community or habitat of threatened species,
- include monitoring of specific threatened species or key species in an endangered ecological community that are to be affected by the proposed development,
- include the criteria for determining the success or failure of the action or measure. These criteria are to include short to long term criteria, and
- 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.

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 pre-determined

criteria for measure the success or failure of the action or measure has been evaluated against the data collected.

As stated in 7.1.2, 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.

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.

Any monitoring proposals presented here are to be incorporated into the Draft Management Plan in 7.1 above.

7.1.4 Contingency Actions

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 7.1.3) indicate the mitigating measures fail to adequately avoid impacts to threatened species.

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.

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))*

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, Coffs Harbour City Local Environment Plan 1988 (and any proposed changes to this LEP including the draft amendment no. 23) and the Draft Vegetation Conservation Development Control Plan (on exhibition until 21 November 2003).

Where a 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 SEE, EIS or REF. However, a summary is to be provided here.

The assessment must include details of the condition and use of other parts of the subject area 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.

This information is essential to allow a proper socio-economic assessment of the proposal by the Director-General of NPW, as required by Section 77C of the *Environmental Planning and Assessment Act 1979*, should the proposal be presented by the determining authority 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 refused.

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.

Additionally, the principles of ecologically sustainable development (ESD) and the precautionary principle are to be given detailed consideration. Australia's National Strategy for ESD defines ESD as:

> "using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased".

The principles that are necessary to understanding sustainable development are inter-generational equity, the precautionary approach and biodiversity conservation. In addressing ESD consideration must be given to the following documents:

- National Strategy for ESD (ESD Steering Committee 1992); and
- Sustainable Development in Australia (Environment Australia 2002), and if possible;
- Applying the Precautionary Principle (Deville and Harding 1997).

9. Additional Information

9.1 Qualifications and experience

> *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, including 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.

9.2 Other approvals required prior to undertaking the development

> *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.

9.3 Licenses required prior to undertaking surveys

Persons conducting flora and fauna surveys must possess appropriate licences or approvals. The relevant legislation and associated licences and approvals that may 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 131) authorising a person to pick the protected native plants specified in the licence

- Licence (Section 132C) authorising a person to pick threatened species and ecological communities and damage their habitat for scientific investigation.

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.

9.4 Expiry of the DGRs

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.

Yours faithfully

ANDREW McINTYRE
Manager, Threatened Species
Northern

for Director-General