

## ECOLOGICAL ASSESSMENT BEVIAN RD CONCEPT APPLICATION BEVIAN ROAD, ROSEDALE

# CONACHER TRAVERS ENVIRONMENTAL CONSULTANTS

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Reference	Issue	Description	Author	Director
6052EA	February 2008	Final	JAT/MSR	JT

## **EXECUTIVE SUMMARY**

This Ecological Assessment has been prepared by *Conacher Travers Pty Ltd* on behalf of *Marsim* (trading as *Nature Coast Developments Pty* Ltd) for the land contained within Lot 2 DP 627034, Lot 2 DP 623340, Lots 11, 29, 32, 72, 102, 118, 119 and 213 DP 755902 Bevian Road, Rosedale, hereafter referred to as 'the subject site' or 'the site'. The subject site occupies an area of 173.59 hectares and is situated within the Eurobodalla Local Government Area (LGA). Figure 1 depicts the subject site location, whilst Figure 2 provides an aerial appraisal of the site.

The Bevian Road Concept Application seeks the approval of two specific plans referred to collectively as 'The Concept Approval Plans'. Specifically these are:

- 'The Constraints Map' (Figure 3 attached) a plan of the net developable area
- 'The Plan of Subdivision' (Figure 4 attached) an 806 lot residential subdivision and 15 community lots. NB: this is a concept layout only, a detailed DA will be lodged once the concept has been approved.

## **Key Ecological Protection and Enhancement Measures**

Overall the Concept Approval Plans are considered to adequately conserve and enhance the ecological features within the site such that the future development will result in an improvement in the ecological functioning of the landscape.

The future development of the site is guided by the **Conservation and Land Use Management Plan** (CLUMP - Conacher Travers 2007c) which provides principles for use of the land and establishment of ecological precincts as E2 Conservation Zones. The Conservation and Land Use Management Plan (CLUMP) forms a component part of the Development Control Plan to be prepared for proposed Masterplan and is an important dynamic part of the planning documents that integrate conservation and land use matters. Once embodied within the DCP, the Council is to assess future proposed development applications against the "Ecological and Bushfire Considerations" (CLUMP - Section 7) when granting consent to a development application on the land.

The management of the site will be controlled by the **Ecological Site Management Plan** (ESMP - Conacher Travers 2007b) that sets up a framework for integrating construction and subdivision works with critical tasks that protect and rehabilitate habitat on site.

The Bevian Road subdivision layout has been designed in response to the environmental constraints identified within the site. As a result areas of conservation and open space have been integrated within the development footprint. Existing ecological features of the site have been protected and enhanced, improving the overall visual amenity of the site.

Key ecological protection and enhancement measures within the site include:

- The retention and fencing of existing native vegetation remnants and hence protection of habitat
- Buffering of Bevian wetland and restoration of associated vegetation
- Revegetation and regeneration of significant watercourses to provide bank stability, create vegetation connectivity and improve habitat
- Upgrading currently eroding gravel pavement on Bevian Road to a sealed surface and lifting the road out of known watercourses.

- Bio-retention swales along roads to treat and slow down runoff from lots and roads and promoting infiltration
- Bio-retention rain gardens on selected lots to infiltrate, treat and slow down runoff from paved areas on the lots
- Gross pollutant traps to remove sediment, debris, organic matter and litter
- Upgrade farm dams to improve runoff quality and provide more diverse aquatic habitat
- · Retention basins to collect sediments and control runoff flows
- Storage and infiltration promotion within bio-retention systems to balance surface and subsurface flows and slow down flows to maintain existing conditions
- Creation of vegetation corridors to improve vegetation connectivity between native remnants and vegetation offsite
- Maintain water flows and maintain or improve water quality within the site to protect downstream water bodies including Saltwater Creek ICOLL and Bateman's Bay Marine Park.

As demonstrated by the Maintain or Improve Test in the Flora and Fauna Assessment (Conacher Travers 2007)), the development footprint allows for a significant improvement in ecological functioning by protecting ecologically sensitive features of the site and enriching habitat within the ecological corridors. Restoration works adjacent to Bevian Wetland and within the ecological corridors results in a net positive ecological outcome overall.

## **Assessment against Director General Requirements**

This assessment has been prepared in accordance with the key ecological issues outlined within the Director Generals Requirements (DGRs), issued by the NSW Department of Planning (DoP) in December 2006. Specifically these issues are:

**Table 1: Director General Requirements** 

No.	Director General Requirement	Relevant section of this report	
-	General Requirements		
- 4	An environmental risk analysis of the project including the consideration of the issues raised during consultation  Environment Protection	Section 1.4 – Table 1.3	
4.1	Address measures for the conservation of animals and plants and their habitat within the meaning of the Threatened Species Conservation Act (1995) having regard to the Draft Guidelines for Threatened Species Assessment (DEC & DPI July 2005). Address the measures for the conservation of aquatic species within the meaning of the Fisheries Management Act (1994)	Addressed in Section 5 of the Flora & Fauna Assessment (Conacher Travers 2007a)  A summary is provided in Section 4.1.2.1 of this report	
4.2	Outline the measures for the conservation of existing wildlife corridor values and/or connective importance of vegetation on the subject land, including areas identified as being of high and/or very high ecological status.	Section 4.1.2.2	
4.3	Demonstrate how the proposal will allow for the future transition of areas of high environmental conservation values to the new Environmental Conservation Zone 2 areas under the LEP template, particularly in relation to riparian corridors, wetlands	Section 4.1.2.3	

	and areas containing Endangered					
	and areas containing Endangered Ecological Communities (EEC).					
5						
5	Riparian Management					
5.1	In accordance with the objectives of the draft Eurobodalla Riparian Corridor Study (RCOS) address riparian zone buffering to the wetland and drainage lines demonstrating how they will be protected and how the downstream environment will not be adversely affected by the proposed development.	Section 4.2.2.1				
5.2	Outline management measures to maintain or improve the stability, water quality, habitat and natural function of the wetland. A core riparian zone extending at least 40 metres from the high water mark plus a further 10 metre buffer is required.	Section 4.2.2.2				
5.3	A 10 metre riparian buffer zone extending from the top of bank is required to all drainage lines within the development area.	Section 4.2.2.3				
6	6 Water Cycle Management					
6.1	Address NSW Coastal Policy, Wetlands Management Policy, Estuary Management Policy, State Rivers Policy and Estuary Policy.	Section 4.3.2.1				
6.2	Address potential impacts on the water quality of surface and groundwater, on all water courses and on ground water dependent ecosystems. Consideration must also be given to the protection of the Bateman's Bay Marine Park.	Section 4.3.2.2				
8	Hazard Management and Mitigation					
8.4	Demonstrate the use of best management sediment and erosion techniques particularly to the area immediately surrounding the SEPP 14 Bevian Wetland.	Section 4.4.2.1				

As demonstrated in the Flora and Fauna Assessment (Maintain or Improve Test), the development footprint allows for a significant improvement in ecological functioning by protecting ecologically sensitive features of the site and enriching habitat within the ecological corridors. Restoration works adjacent to Bevian Wetland and within the ecological corridors results in a net positive ecological outcome.

#### Key ecological protection and enhancement measures

Overall the Concept Approval Plans are considered to adequately conserve and enhance the ecological features within the site such that the future development will result in an improvement in the ecological functioning of the landscape.

The future development of the site is guided by the **Conservation and Land Use Management Plan** (CLUMP - Conacher Travers 2007c) which provides principles for use of the land and establishment of ecological precincts as E2 Conservation Zones. The Conservation and Land Use Management Plan (CLUMP) forms a component part of the Development Control Plan to be prepared for proposed Masterplan and is the most important dynamic of the planning documents that integrates conservation and land use matters. Once embodied within the DCP, the Council is to assess future proposed development applications against the "considerations" (Section 7) when granting consent to a development application on the land.

The management of the site will be controlled by the **Ecological Site Management Plan** (ESMP - Conacher Travers 2007b) that sets up a framework for integrating construction and subdivision works with critical tasks that protect and rehabilitate habitat on site.

Key ecological protection and enhancement measures within the site include:

- The retention and fencing of existing native vegetation remnants and hence protection of habitat
- Buffering of Bevian wetland and restoration of associated vegetation
- Revegetation and regeneration of significant watercourses to provide bank stability, create vegetation connectivity and improve habitat
- Upgrading currently eroding gravel pavement on Bevian Road to a sealed surface and lifting the road out of known watercourses.
- Bio-retention swales along roads to treat and slow down runoff from lots and roads and promoting infiltration
- Bio-retention rain gardens on selected lots to infiltrate, treat and slow down runoff from paved areas on the lots
- Gross pollutant traps to remove sediment, debris, organic matter and litter
- Upgrade farm dams to improve runoff quality and provide more diverse aquatic habitat
- Retention basins to collect sediments and control runoff flows
- Storage and infiltration promotion within bio-retention systems to balance surface and subsurface flows and slow down flows to maintain existing conditions
- Creation of vegetation corridors to improve vegetation connectivity between native remnants and vegetation offsite
- Maintain water flows and maintain or improve water quality within the site to protect downstream water bodies including Saltwater Creek ICOLL and Bateman's Bay Marine Park.

As demonstrated by the Maintain or Improve Test in the Flora and Fauna Assessment (Conacher Travers 2007)), the development footprint allows for a significant improvement in ecological functioning by protecting ecologically sensitive features of the site and enriching habitat within the ecological corridors. Restoration works adjacent to Bevian Wetland and within the ecological corridors results in a net positive ecological outcome overall.

#### **Outcome of DGR Assessments**

In accordance with the Director General Requirements, the following outcomes have been achieved.

#### **DGR 4.1**

A maintained or improved result has been achieved for threatened flora, endangered ecological communities and a number of threatened fauna species known to occur or with the potential to occur within the site (Section 5).

The implementation of the following mitigation measures will result in the protection of threatened flora and fauna species and endangered ecological communities known to occur or with the potential to occur within the site:

- Exclusion of existing cattle grazing;
- Weed control:
- Erosion control;
- Installation of protective fencing and signage;

- Stormwater Quality and Quantity Control (Bio-retention basins, bio-swales, gross pollutant traps, rainwater tanks and revegetation of watercourses);
- Retention of Dead Timber and Habitat Supplementation;
- Prohibition of domestic animals with the exception of companion animals as defined under the Companion Animals Act 1998;
- Retention of Regrowth;
- Creation of vegetation corridors;
- Retention or replacement of all hollow bearing trees; and
- Strategic Supplementary Planting

As such, the Bevian Road Concept Application adequately meets the requirements of the *Draft Guidelines for Threatened Species Assessment* (DEC & DPI July 2005) and the provisions of the *Threatened Species Conservation Act* 1995.

#### **DGR4.2**

The creation of Ecological Corridor 1 and Ecological Corridor 2 will link the existing native remnants to vegetation offsite. The improved vegetation connectivity across the site will assist fauna movement and improve water quality within and downstream from the site. Landscaping with locally occurring native species within open space areas and streets will also serve as stepping stones to the ecological corridors. As such the Concept Application meets the requirements of *DGR 4.2*.

#### **DGR4.3**

The incorporation of conservation areas into E2 Environmental Conservation Zones will ensure long term protection of ecologically sensitive features and as such meets the requirements of *DGR 4.3*.

#### **DGR 5.1**

The provision of buffers to watercourses (ecological corridors 1 & 2), revegetation of the riparian vegetation, restoration of vegetation surrounding the Bevian Wetland and the implementation of water sensitive urban design principles across the site; the Bevian Road Concept Application will achieve an improvement in habitat and water quality within and downstream from the site and as such meets the requirements of *DGR 5.1*.

#### DGR 5.2

Bevian Wetland will primarily be protected by a 50 metre buffer plus asset protection zones to the wetland. Extensive restoration surrounding the wetland for the rehabilitation of associated endangered ecological communities, installation of two primary dry detention basins to the north of the wetland and the implementation of water sensitive urban design across the site maintains and improves stability, water quality, habitat and natural functioning of Bevian Wetland. As such the Concept Application meets the requirements of *DGR 5.2*.

## **DGR 5.3**

Department of Natural Resources (now Department of Water and Energy - DWE) buffer requirements for water course, were agreed to during a site visit by the DWE Representative Bob Britten on the 22 November 2006. All buffers have been designed to provide appropriate bank stability and water quality protection for Category 3 watercourses. Revegetation of watercourses will also improve vegetation connectivity and habitat across the site. As such the Concept Application meets the requirements of *DGR 5.3*.

#### DGR 6.1 & 6.2

Four water related policies - NSW Coastal Policy, Wetlands Management Policy, Estuary Management Policy and NSW State Rivers and Estuary Policy - have been addressed within this report. The protection of water courses and receiving water bodies on site and

downstream of the site has been fundamental to the subdivision plan. The implementation of water sensitive urban design principles has enabled the protection of surface and subsurface flows to these aquatic areas and as such the Concept Application meets the requirements of DGR 6.1 and DGR 6.2.

## **DGR 8.4**

The management of erosion and sediment transportation across the site prior, during and post construction has been addressed through the application of the following management measures:

- Silt fencing reinforced with haybales including double protection where necessary.
- Stabilisation of exposed soils
- Gross Pollutant Traps (GPTs)
- Grass swales within road reserves
- Dry detention basins
- Revegetation of watercourses

The application and monitoring of these measures will be controlled in accordance with the Ecological Site Management Plan (Conacher Travers 2007b). A statement of commitments and the Community Management Statement including the preparation of a detained Sediment and Erosion Control Plan will be integrated with the Ecological Site Management Plan to ensure that all critical outcomes are achieved on site. As such it is considered that the Concept Application effectively demonstrates the use of best practice sediment and erosion control techniques across the site and meets the requirements of *DGR 8.4*.

## **Compliance with statutory requirements**

## Eurobodalla Shire Council Local Government Policy

• Yellow bellied Glider Policy (specific to Broulee area)

This Eurobodalla Shire Council local government policy does not strictly apply to the subject site however, given the proximity (<5km) of the site to the Broulee area and the record of a Yellow bellied Glider within the site, the policy objectives are considered relevant to ensure the long term protection of this Yellow bellied Glider habitat within the site.

This policy is specifically addressed in Section 4.1.2.1 - Threatened Species Conservation of this report.

## <u>Environmental Planning & Assessment Act 1979 – Part 3A Environmental Assessment Requirements</u>

The *EP&A Act 1979* requires the assessment of threatened species as per the DRAFT Guidelines for Threatened Species Assessment (DEC & DPI 2005). This has been undertaken within Section 5 of the Flora and Fauna Assessment (*Conacher Travers 2007a*) and a summary is provided in Section 4.1.2.1 of this report. The results of the assessment are as follows:

## Endangered Ecological Communities

The application of the maintain and improve assessment for Swamp Oak Floodplain Forest (SOFF), Riverflat Eucalypt Forest on Coastal Floodplains (RFEFCF) and Freshwater Wetlands on Coastal Floodplains (FWCF), Tables 3-5 respectively, resulted in a maintained or improved outcome for all endangered ecological communities identified within the site.

The area of habitat for these endangered ecological communities pre and post development is as follows:-

- The total extent of SOFF will increase from 11.23ha to 14.46ha, whilst the total area of good condition vegetation will improve from 4.57ha to 12.41ha.
- The total extent of RFEFCF will increase from 2.05ha to 2.43ha, whilst the total area of good condition vegetation will improve from 0ha to 1.61ha.
- The total extent and condition of FWCF will be maintained at 5.94ha.

Specifically, an improvement in both the condition and overall extent will be achieved through the restoration and revegetation of endangered ecological communities SOFF and RFEFCF.

All endangered ecological communities recorded on site will be protected from indirect impacts such as stormwater runoff through the implementation of bio-swales along road sides, bio-retention basins, gross pollutant traps and the revegetation of watercourses.

As such it is considered that the Bevian Road Concept Application will result in a net improvement in the extent and condition of Swamp Oak Floodplain Forest and Riverflat Eucalypt Forest on Coastal Floodplains and will maintain the extent and condition of the existing Freshwater Wetlands on Coastal Floodplains of endangered ecological communities recorded within the subject site.

#### Threatened Flora

The application of the maintain and improve assessment for *Aldrovanda vesiculosa* and *Correa baeuerlenii*, Tables 7 & 8 respectively, resulted in a maintain or improved outcome for all threatened flora species with the potential to occur within the site.

Specifically, a significant improvement in overall extent of suitable habitat for *Correa baeuerlenii* will be achieved from the existing 18.68ha to 42.8ha. This is a result of the revegetation works across the site, which will create ecological corridors through the replanting of Spotted Gum/Ironbark Forest and Blackbutt Woodland.

The total extent of suitable habitat for *Aldrovanda vesiculosa* will be maintained within the Bevian Wetland.

As such, the Bevian Road Concept Application will result in maintained or improved suitable habitat for threatened flora species with the potential to occur within the subject site.

#### Threatened Fauna

The application of the maintain and improve assessment for threatened fauna, Tables 10-29, resulted in a maintained or improved outcome for all threatened fauna species known to occur or with the potential to occur within the site.

Habitat types used for the assessment were based on natural vegetation communities listed in Table 2 of this report, with the exception of the Grassland with Scattered Trees vegetation community.

The Grassland with Scattered Trees vegetation community, which covers approximately 78% (146.68 ha) of the site (Figure 6), has been excluded from the assessment based on its disturbed nature. 142.62 ha of this community will be removed as a result of the proposed

development. This habitat is not considered to be significant to the lifecycle of any threatened fauna species for the following reasons:

- Grassland with Scattered Trees habitat is considered to be of low quality due to past agricultural associated clearing and current grazing by cattle.
- The Grassland with Scattered Trees habitat is considered to provide a limited foraging resource only and as such provides marginal habitat.
- The majority of the threatened fauna likely to utilise the Grassland with Scattered Trees habitat are considered to be highly mobile and would be unlikely to utilise the subject site exclusively. Surrounding farmlands to the north and west of the site provide similar cleared lands with scattered trees suitable for foraging.
- Any hollow bearing trees identified within the Grassland with Scattered Trees habitat will be retained within the post development landscape or replaced at a ratio of 2:1 in conservation zones (Figure 7) within the subject site.
- Areas of cleared foraging land will be retained across the site in the form of open space/recreation areas and larger lots
- Compensatory habitat will be provided for within the site including the restoration of Ecological Corridors 1 & 2 (Schedule 1 - Restoration Management Plan of the ESMP), which will create new vegetation linkages between remnants within and offsite and the retention and restoration of the Southern Conservation Zone (Schedule 1 - Restoration Management Plan of the ESMP).
- Of the twenty (20) threatened fauna species considered to have a loss in suitable habitat within the site, four (4) have been recorded within the site (Table 29). These four species are: Powerful Owl, Eastern Freetail Bat, Greater Broad-nosed Bat and Eastern Bentwing Bat. These species are considered to be highly mobile and are unlikely to utilise the subject site exclusively. Habitat to the north and west of the site are likely to provide a similar foraging resource for these species.

The overall existing suitable habitat for threatened fauna within the subject site, excluding the Grassland with Scattered Trees vegetation community, is 40.94ha. As a result of the retention, restoration and revegetation works proposed within the site the net suitable habitat will be improved to 74.9ha.

As such, the Bevian Road Concept Application will result in a net improvement in suitable habitat and vegetation connectivity for all threatened fauna species known to occur and with the potential to occur within the subject site and any losses in Grassland with Scattered Trees habitat are considered to be insignificant.

## Threatened Species Conservation Act (1995)

The specific requirements of the *Threatened Species Conservation (TSC) Act* (1995) must be addressed in the assessment of flora and fauna matters. This requires the consideration of potential impacts on threatened species, populations and ecological communities. An assessment has been undertaken within Section 5 of the Flora and Fauna Assessment report (*Conacher Travers 2007a*) and a summary provided in Section 4.1.2.1 of this report.

The result of the assessment was that there is unlikely to be any significant impacts from the proposed development on threatened species or endangered ecological communities.

## Fisheries Management Act (1994)

No threatened fauna species listed under this Act have been recorded within the subject site or are considered to have the potential to occur within the site. The Concept Application will improve aquatic habitat within the site through the revegetation of watercourses and the provision of appropriate fish passage along watercourses in the northern portion of the site,

which connects with Saltwater Creek ICOLL before reaching the South Pacific Ocean at Rosedale Beach.

## Rivers & Foreshores Improvement Act (1984)

The Bevian Road Concept Application will protect all nominated water courses recognised under this Act by providing riparian buffer setbacks consistent with Category 3 Watercourses. In difference to DGR 5.3, it has been concluded that due to the high level of erosion found within each watercourse, there is no defined 'top of bank'. In consultation with DECC (Bob Britten formerly DNR), Bob Britten has agreed to a riparian buffer concept that protects a 1:2 year flow event, protects the erosion banks and provides a total width that reflects at a minimum reflects a category 3 watercourse. In addition, water sensitive urban design principles have been applied across the site and as such the Concept Application has met the requirements of this Act to protect the nominated watercourses.

This Act is specifically addressed in Section 4.2.2.1- Riparian Zone Buffers of this report.

## SEPP 71 – Coastal Protection

The Concept Application meets the requirements of SEPP 71 through the retention, protection, enhancement of vegetation and implementation of water sensitive urban design within the site. As a result water quality within and downstream of the site will be improved and native flora and fauna habitats will be enhanced.

This policy is specifically addressed in Section 4.3.2.2 – Water quality and quantity management of this report.

## SEPP 44 - Koala Habitat Protection

Given the absence of Potential or Core Koala habitat within the subject site and a maintain or improve outcome for flora and fauna habitats in Section 5 of the Flora and Fauna Assessment Report (Conacher Travers 2007a), the subject site is not considered to contain significant Koala habitat. The Concept Application is unlikely to have an impact on Koala populations or its habitat. Further to this, the proposed development will improve the potential habitat for this species through the creation of wildlife corridors between remnants within the site and vegetation off site. Planting of foraging species will also enrich the potential habitat on site.

This policy is specifically addressed in Section 4.1.2.1- Threatened species conservation of this report. The Policy is also addressed within Section 4.11.1 of the Flora and Fauna Assessment (Conacher Travers 2007a).

#### SEPP 14 – Coastal Wetlands

Key ecological aspects of this policy considered within this report include: the growth of native plant communities, the survival of native wildlife populations, the provision of quality of habitat for both indigenous and migratory species, the surface and groundwater characteristics of the site on which the development is proposed to be carried out and of the surrounding area, including salinity and water quality. The Concept Application is considered to meet each of these objectives through the protection and enhancement of native vegetation surrounding Bevian Wetland, restoration of watercourses, overall improvement in vegetation connectivity across the site and the treatment of stormwater runoff to a high standard. As a result of the identified mitigative measures, the current quality of habitat within Bevian Wetland will be maintained and surrounding habitat significantly expanded.

This policy is specifically addressed in Section 4.2.2.1- Riparian Zone Buffers, (c) Bevian Wetland, of this report.

## NSW Coastal Policy, Wetlands Management Policy, Estuary Management Policy and NSW State Rivers and Estuary Policy

The protection of water courses and receiving water bodies on site and downstream of the site has been fundamental to the subdivision plan. The implementation of water sensitive urban design measures will enable the protection of surface and subsurface flows moving into water ways and waterbodies' onsite and offsite to the Saltwater Creek ICOLL and Bateman's Bay Marine Park. As such the Concept Application meets the requirements of these policies.

These policies are specifically addressed in Section 4.3.2.1 - Water related policies, of this report.

## Native Vegetation Management Act (2003)

Under the *Native Vegetation (NV)* Act (2003) and Regulations gazetted in December 2006, native vegetation protected under the Act, likely to be impacted by a development, may require a referral to the relevant CMA. However, given that the Rosedale development application is being considered under Part 3A of the *EP&A* Act (1979), the following exemption applies:

Section 75U of the EP&A Act (1979) states that approval under section 12 of the NV Act (2003) is not required for clearing of native vegetation.

The Minister may still choose to refer the development proposal application to the relevant CMA (in this case Southern Rivers CMA).

Liaisons with Donna Hazel, Native Vegetation Coordinator, of the Southern Rivers CMA on the 19 April 2007, advised that if the project is referred to the CMA, a simulated assessment may be undertaken for the site to determine whether or not a maintain or improve outcome could be achieved.

Three of the four zonings within the site are potentially caught by the *NV Act* (2003). These are: Zone 1c - Rural Small Holdings (6.84ha), Zone 1a - Environmental Constraints (15.58ha) and Zone 7a - Environment Protection - wetlands (8.31ha). Subsequent advice from the Department of Planning originating from the CMA, has identified that land zoned 10 - Urban Expansion (159.11ha) is also covered under the NV Act (2003).

The Threatened Species Assessment Guidelines for 3A applications require the completion of a maintain or improve test which is based on the Biometric Assessment Guidelines in particular the method of determining the condition of Endangered Ecologically Communities. This assessment identified that that there is unlikely to be any significant impacts from the proposed development on threatened species or endangered ecological communities

A maintained or improved result has been achieved for threatened flora, endangered ecological communities and a number of threatened fauna species known to occur or with the potential to occur within the site (Section 5).

In order to ensure that a positive outcome is achieved overall for on site a net positive outcome of an additional 13.5 hectares of native vegetation will be regenerated onsite.

There will also be an increase in high quality habitat for Endangered Ecological communities.

Future studies onsite to enable a PVP assessment for may be undertaken subject to consultation with the CMA.

## Environment Protection and Biodiversity Conservation Act (1999)

No threatened fauna or flora listed under this Act has been recorded within the site, however, the Concept Application will retain, protect and enhance native vegetation and habitat within the site such that any threatened species with the potential to occur within the site will not be impacted by the proposed development.

## Correspondence with the Department of Planning 25 January 2008

In response to correspondence from the Department of Environment and Climate Change (Correspondence dated 8 January 2008 DECC Ref: FIL06/1793) to the Department of Planning, *Travers Environmental* provided comments to further define the concept planning process being undertaken by the master planning team in order to clarify specific issues raised by the DECC. The *Travers Environmental* response is attached as Addendum 1.

This correspondence reemphasised the importance of the Conservation Land Use Management Plan (CLUMP) and Ecological Site Management Plan (ESMP) which are the principal conservation planning documentation managing the site's ecology and proposed land use.

This correspondence specifically sought to clarify the issues raised by the DECC. The issues addressed include:

- Assessment of matters of national significance.
- The draft statement of commitments
- Conservation of threatened fauna and their habitat notably hollow breeding habitat.
- Conservation of endangered ecological communities.
- · Habitat connectivity for Endangered Ecological Communities

In support of these issues further habitat tree survey, assessment and mapping was undertaken and provided in the addendum response. Figure 10 – Hollow Bearing Trees summarises the findings of the survey and has been attached to the addendum.

The DECC has concluded that the current documentation and addendum response has adequately addressed the requirements as stipulated by the Director General and has given their support in principal for the proposed concept application.

#### **PROJECT TEAM**

Conacher Travers Pty Ltd

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#### Licences -

## **National Parks and Wildlife Service**

Individual staff members are licensed under Clause 20 of the *National Parks and Wildlife (Land Management) Regulation 1995* and Section 120 & 131 of the *National Parks and Wildlife Act, 1974* to conduct flora and fauna surveys within service and non-service areas.

## **Department of Agriculture**

The staff of *Conacher Travers* are licensed under an Animal Research Authority issued by the Department of Agriculture. This authority allows *Conacher Travers* staff to conduct various fauna surveys of native and introduced fauna for the purposes of environmental consulting throughout New South Wales.

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FIGURES FIGURE 1 FIGURE 2 FIGURE 3 FIGURE 5 FIGURE 6 FIGURE 7 FIGURE 8.1 FIGURE 8.2 FIGURE 8.3 FIGURE 8.4 FIGURE 8.5 FIGURE 9	Property Location Aerial appraisal Constraints Map Subdivision Plan Precinct Plan Vegetation Communities Flora and Fauna Survey Buffer Analysis Buffer Analysis (Riparian Zoom) Buffer Analysis (Riparian Zoom) Buffer Analysis (Riparian Zoom) Buffer Analysis (Riparian Zoom) Buffer Analysis – Bevian Wetalnd Buffer Analysis – Cross Sections Catchment Map	
SCHEDULES SCHEDULES SCHEDULES	Bushfire Protection Measures Restoration Management	
APPENDICE APPENDIX 1		

## **SECTION 1 INTRODUCTION**

This Ecological Assessment has been prepared by *Conacher Travers Pty Ltd* on behalf of *Marsim (*trading as *Nature Coast Developments Pty* Ltd) for the land contained within Lot 2 DP 627034, Lot 2 DP 623340, Lots 11, 29, 32, 72, 102, 118, 119 and 213 DP 755902 Bevian Road, Rosedale, hereafter referred to as the subject site.

This document forms the basis of an assessment required under Part 3A of the *Environmental Planning and Assessment Act* (1979) and is in accordance with the Director General Requirements for the subject site (DoP 2006).

## 1.1 SITE CHARACTERISTICS

The planning and cadastral details of the subject site are provided in Table 1.1 while Table 1.2 summarises the geographical characteristics of the site.

Table 1.1 - Site Details

Location	Lot 2 DP 627034, LOT 2 DP 623340, LOTS 11,29, 32, 72, 102, 118, 119 and 213 DP 755902, Bevian Road, Rosedale		
Area	173.59		
Topographic Map	Mogo 1:25000		
Grid Reference	247500E 6033000N		
Local Government Area	Eurobodalla		
Existing Land Use	Stock agistment		
Zoning	Zonings under the Eurobodalla Rural Local Environmental Plan (1987):  - Land subject to Part 3A application - Zone 10 - Urban Expansion, 1(c) - Rural Small Holdings and 7(a) - Environment Protection (Wetlands)  - Residual land in the north western corner - 1(a) - Environmental Constraints		
Proposed Development	806 Lot Residential Subdivision and 15 Community lots		

**Table 1.2 - Site Characteristics** 

Elevation	10m AUD within Poving Swamp to 100 m (AUD) on the ridge within
Elevation	10m AHD within Bevian Swamp to 100 m (AHD) on the ridge within
	the north-western section of the subject site.
Topography	Gently undulating to steep land with a network of drainage lines and
	eroded Category 3 watercourses. A ridge traverses the central
	portion of the site in a east west direction divides the site into
	northern and southern catchment slopes.
Slope	Gradients of the subject site range from steep 20° in the upper to less
	than 5° surrounding the Bevian Swamp.
Aspect	Generally south, with south-east in northern section and south in
	southern section
Soil Type	Soils in the southern portion of the site are alluvial, which are derived
	from quaternary sediments. The soils consist of gravel, sands and
	silts and are moderately deep and clayey with no rock outcrops.
	Soils in the northern portion of the site are coalluvial and are derived
	from the Wagona and Bogolo formations.

Table 1.2 - Site Characteristics (Cont.)

Drainage	The northern half of the site drains south east into Saltwater Creek, whilst the southern half of the site drains south into the Bevian Wetland. Both catchments eventually drain into the South Pacific Ocean at Rosedale Beach and Barlings Beach respectively.
Vegetation	A mixture of open forest and woodland dominated by South Coast dry shrub/cycad/forest on the upper slopes and disturbed remnants of swamp forest communities on lower slopes within the vicinity of Bevian Wetland.



Lower slopes surrounding Bevian Wetland

## 1.2 EXISTING LAND USE

An existing residence is located in the north east of the subject site adjoining Bevian Road. An old 'Cheese Factory' is contained with the house paddock of the existing residence. A nursery, that is no longer operational, is located to the south west of the residence, extending to cattle yards and sheds further south. A pump station is located in the drainage line to the south of the nursery.

The subject site has been subjected to extensive clearing, with most of the natural vegetation being removed. The majority of the subject site consists of pasture with scattered trees and fragmented areas of remnant vegetation along the peripheries. Recent native regrowth (less than 12 months old) occurs on the lower slopes adjacent to Bevian Wetland. Cleared areas of the subject site are currently being used for cattle grazing. Impacts of grazing are also evident within the more accessible vegetation remnants.

A series of ten (10) dams have been constructed throughout the site. Four dams are located in the northern watercourse, three in the watercourse to the south of the nursery, one to the east of the "The Knoll", one within the Swamp Oak Open Forest to the west of Bevian Road and one to the west of the Blackbutt Woodland vegetation community.



Dairy farming has been undertaken across the majority of the property which included cheese production in the old cheese factory. Dairying was supplemented by a wholesale nursery. The property is currently used for livestock agistment.

Surrounding land comprises a mix of zonings and uses including uncleared rural zoned land (to the north and north-west), rural – residential subdivision (south east and south west), residential to the east over George Bass Drive. A caravan park to the south that has been approved for residential development at Barlings Beach (Refshauge *et al* 2006).

#### 1.3 OVERVIEW OF THE PROPOSED DEVELOPMENT

The proposed Bevian Road Concept Application seeks the approval of two specific plans referred to collectively as 'The Concept Approval Plans'. Specifically these are:

- 'The Constraints Map' (Figure 3 attached) a plan of the net developable area
- 'The Plan of Subdivision' (Figure 4 attached) an 806 lot residential subdivision and 15 community lots. *NB: this is a concept layout only, a detailed DA will be lodged once the concept has been approved.*

The subdivision also includes the establishment of a series of Ecological Corridors (182) and the Southern Conservations Zone that will be zoned as E2 conservation (Schedule 3).

A comprehensive set of Draft documents have been prepared for the proposed subdivision. As the 'Plan of Subdivision' is a concept layout only at this stage, the supporting documents will be finalised to accompany the final subdivision plan.

The supporting documents that should be referred to and that relate to this ecological assessment are as follows:

- Conservation and Land Use Management Plan
- Flora and Fauna Report
- Bushfire Protection Assessment
- Fuel Management Plan
- Ecological Site Management Plan

#### 1.4 ENVIRONMENTAL RISK ANALYSIS

An environmental risk analysis has been prepared to address key issues raised in the Director General Requirements (DoP 2006, see Appendix 1) and the preliminary consultation process. Environmental risks, risk rating, mitigation measures and the post mitigation risk rating with implementation of relevant mitigation measures have been analysed in Table 1.3 - Environmental Risk Analysis Matrix.

**Table 1.3: Environmental Risk Analysis Matrix** 

Environmental Risks	Risk rating (low – med – high)	Mitigation measures	Risk rating post mitigation
Eutrophication of water bodies	Low	All water bodies are currently in good condition. Water sensitive urban design principles will be implemented to treat stormwater runoff to a standard better than the current water quality conditions.	Low
Degradation of fish and plant habitat	Low	Rehabilitation of watercourse, establishment of native buffers, and stormwater treatment.	Low
Increased turbidity	Low	All water bodies are currently in good condition. Water sensitive urban design to treat stormwater runoff to a standard better than the current water quality conditions. Implementation of sediment and erosion control measures.	Low
Changes in hydrological functioning of wetland	Low	Water sensitive urban design resulting in the alterations of peak discharges similar to the current conditions	Low
Soil erosion	Med	Erection of silt fencing during construction phase, stabilisation of exposed surfaces, installation of temporary sedimentation basins, rapid establishment of ground covers on exposed soils, medium term revegetation works	Low
Loss of or damage to Aboriginal relics	Low	Protection of archaeological pads, collection and relocation of Aboriginal relics within conservation zones, open space areas and riparian zones. Awareness information within civic facilities and signage within conservation zones.	Low
Loss of or damage to European history	Low	Retention of the cheese factory, collect records and photographic journal, public display and signage.	Low

Table 1.3: Environmental Risk Analysis Matrix (Cont.)

Environmental Risks	Risk rating (low – med – high)	Mitigation measures	Risk rating post mitigation
Changes in soil profiles	Med	Retain natural soil topography where possible minimise cut and full works, strip, relocate and replace top soils as a standard earthworks procedure.	Low
Increased noise levels	High	Attenuate noise from aerators associated with Sewage Treatment Plant (STP), maintain setbacks from STP, logical traffic access points and road networks, reduce use of traffic calming devices, public transport facilities, impose speed limit to a maximum of 40km/hr, passive walking and cycling trails and restricted work hours during construction phases.	Low - Med
Soil compaction	Med	Designated access ways for heavy vehicles during construction phase, protection of tree roots with fencing at drip line, rip soils that have been overly compacted. Ensure adequate replacement of A & B horizons	Low
Increased odour emissions	High	Setbacks from STP, augmentation of existing STP to increase capacity and reduce odour emissions.	Low
Loss of remnant vegetation	Low	Protection of conservation areas and ecological corridors, revegetation and regeneration of viable remnant vegetation, offset revegetation works.	Low
Loss of Endangered Ecological Communities	Low	Conserve good quality endangered ecological communities, regenerate areas of high resilience, revegetation in offset areas.	Low
Loss of vegetation connectivity (movement corridors for fauna and genetic transfer of plant material)	Low	Revegetation and rehabilitation works to maintain and enhance vegetation linkages especially along riparian corridors.	Low
Loss of threatened species habitat	Low	Maintain or improve areas of Threatened Species Habitat within the subdivision. Offset with rehabilitation works.	Low

**Table 1.3: Environmental Risk Analysis Matrix (Cont.)** 

Environmental Risks	Risk rating (low – med – high)	Mitigation measures	Risk rating post mitigation
Increased weed infestations	High	Implementation of a long term and comprehensive weed control and regeneration program. Promote a coastcare group to support the community association and promote use of native species	Low
Increased rubbish dumping	High	Waste Collection and management program. Public awareness program, participate in clean up day. Signage.	Low - Med
Trampling of vegetation	Med	Removal of livestock, fencing at key public focal points, design of a practical public pathway system.	Low

As a result of the analysis within the risk matrix, Table 1.3, the majority of the identified environmental indicators associated with potential impacts from the proposed development are likely to be mitigated, such that their risk of occurrence is low. Three indicators, increased noise levels, increased weed infestations and increased rubbish dumping, have an increased risk of occurring. The impacts of increased weed infestations and rubbish dumping may be managed through the community association. The community association will be responsible for the ongoing monitoring, regulation and maintenance procedures to ensure these risks are not elevated to a significant level and to ensure that appropriate public programs are put in place for managing waste, weeds and noise.

## **SECTION 2 LEGISLATIVE CONTEXT**

The following legislative requirements are addressed within this Ecological Assessment in accordance with the specific DGRs.

## 2.1 LOCAL GOVERNMENT REQUIREMENTS

#### 2.1.1 Eurobodalla Shire Council Policies

## 2.1.1.1 Yellow bellied Glider Policy (specific to Broulee area)

The purpose of this policy, developed in conjunction with the National Parks and Wildlife Service, is to;

- (i) define development or activities that will not significantly impact on the Yellowbellied Glider or its habitat,
- (ii) to ensure the long-term persistence of Yellow-bellied Gliders within the Broulee Area through retention of suitable habitat and other development controls, and
- (iii) to provide a platform for a similar approach to the entire Coastal Plains of Eurobodalla Shire.

The objectives of the policy are to:

- Ensure the long-term persistence of Yellow-bellied Gliders within the Broulee Area, through retention of suitable habitat and other development controls, as appropriate;
- Make landowners aware of the existence of Yellow-bellied Gliders and their habitat;
- Provide certainty with regard to future development proposals within the Broulee Area in relation to potential conflict with the ongoing conservation of the Yellow-bellied Glider;
- Allow consent and concurrence authorities to make a more informed decision with regard to developments and activities that impact upon the habitat of the Yellowbellied Glider; and
- Reduce cost to the landholders and the development industries within the Broulee
  Area by reducing the frequency that Species Impact Statements are produced in
  those instances where the development potentially impacts upon the habitat of the
  Yellow-bellied Glider.

This policy reduces the need for the preparation of a Species Impact Statement to address impacts on Yellow-bellied Gliders if the development proposal conforms to the Yellow-bellied Glider Policy. The policy does not consider the impact of development or activities on other listed Threatened Species.

This policy is specifically addressed in Section 4.1.2.1 - Threatened species conservation of this report.

## 2.2 STATE LEGISLATIVE REQUIREMENTS

## 2.2.1 Environmental Planning & Assessment Act 1979 – Part 3A Environmental Assessment Requirements

Major projects under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) require the Director-General of the NSW Department of Planning to prepare a list of requirements for the Environmental Assessment. These requirements outline the key

issues to be addressed and the level of assessment needed. Director-General Requirements (DGRs) are identified by consultation between the Director General and other relevant government agencies. The requirements are then issued to the proponent. Appendix 1 of this report refers to the full list of DGRs issued by the NSW DoP in December 2006.

This Act is specifically addressed in Section 4.1.2.1- Threatened species conservation of this report and within Addendum 1 of the Flora and Fauna Assessment (Conacher Travers 2007a).

## 2.2.2 Threatened Species Conservation Act (1995)

The specific matters of the *TSC Act* (1995) are required to be addressed in the assessment of impacts of the proposed development on flora and fauna. This requires the consideration of potential impacts on threatened species, populations and or ecological communities.

The factors to be taken into account in deciding whether there is a significant effect are set out in Section 5A of the *EP&A Act* (1979) and are based on a 7 part test of significance. In the case of a proposal assessed under Part 3A – Major Projects of the EP&A Act (1979), the Maintain or Improve Test must be applied in preference to the 7-part test under Section 5A.

Where a proposed activity is located in an area identified as critical habitat, or such that it is likely to significantly affect threatened species, populations, ecological communities, or their habitats, a Species Impact Statement (SIS) is required to be prepared.

This Act is specifically addressed in Section 4.1.2.1- Threatened species conservation of this report and within Section 4.6.1, 4.11.1 of the Flora and Fauna Assessment (Conacher Travers 2007a).

#### 2.2.3 Fisheries Management Act (1994)

The *Fisheries Management Act* (1994) provides a list of threatened aquatic species which require consideration when addressing the potential impacts of a proposed development. In terms of subdivision design, consideration is to be given to reducing barriers to fish passage appropriate to the habitat type and size of watercourses present on site.

This Act is specifically addressed in Section 4.1.2.1- Threatened species conservation of this report and within Section 4.11.1 of the Flora and Fauna Assessment (Conacher Travers 2007a).

## 2.2.4 Rivers & Foreshores Improvement Act (1984)

The *RFI* Act (1984) provides for carrying out of works for the removal of an obstruction from and the improvement of rivers and foreshores, and the prevention of erosion of lands by tidal and non-tidal waters.

Part 3A of the Act requires a permit to be issued (including appropriate bonds) for any works undertaken in or within 40 metres of protected waters. Protected waters are defined under the Act as a river, lake into or from which a river flows, coastal lake or lagoon (including any permanent or temporary channel between a costal lake or lagoon and the sea).

This Act is specifically addressed in Section 4.2.2.1- Riparian zone buffering of this report.

## 2.2.5 State Environmental Planning Policies (SEPPs)

#### 2.2.5.1 SEPP 71 - Coastal Protection

This planning policy aims to protect and manage the coastal zone in accordance with the principles of ecologically sustainable development. The matters for consideration include public access, suitability of the land for development, scenic qualities, wildlife corridors, significant loss of views, coastal hazards, cultural places and heritage. Issues that are required by SEPP 71 to be addressed include:

- 1. Design principles drawn from analysis of the subject site and context
- 2. Desired future locality character
- Location of any development, natural features including coastal processes and hazards
- 4. Scale of development and integration with existing landscape
- 5. Phasing of development
- 6. Public access to and from coastal foreshore
- 7. Pedestrian, cycle and road access and circulation networks
- 8. Subdivision pattern
- 9. Infrastructure provision
- 10. Building envelopes and built form controls
- 11. Heritage conservation
- 12. \* Site remediation (Note 1)
- 13. Provision of public facilities and services
- 14. Provision of open space, its function and landscaping
- 15. \* Conservation of water quality and use (Note 1)
- 16. \* Conservation of animals, plants and their habitats (Note 1)
- 17. \* Conservation of fish and marine vegetation and their habitats (Note 1)

Items 1-11 and 13-14 are addressed in other supplementary reports, whilst items 12, 15-17 are addressed within this Ecological Assessment.

#### NOTE 1

Items 12, 15-17 are specifically addressed in Section 4.3.2.2 – Water quality and quantity management, Section 4.1.2.1 – Threatened Species Conservation, 4.2.2.1 – Riparian Zone Buffers, 4.2.2.2 – Ecological Function of Bevian Wetland, 4.2.3 – Fish Passage and Habitat, and 4.3 – watercycle Management. The specific rehabilitation measures are identified within the Ecological Site Management Plan (Conacher Travers 2007b)

## 2.2.5.2 SEPP 44 – Koala Habitat Protection

This planning policy aims to encourage the conservation and appropriate management of areas of natural vegetation with potential to provide habitat for Koalas. It outlines the procedures for the identification of core and non-core Koala habitat and provides for appropriate management.

This policy is specifically addressed in Section 4.1.2.1- Threatened species conservation of this report. The Policy is also addressed within Section 4.11.1 of the Flora and Fauna Assessment (Conacher Travers 2007a).

#### 2.2.5.3 SEPP 14 – Coastal Wetlands

This planning policy identifies and maps important coastal wetlands throughout New South Wales, which require consideration when addressing the potential impacts of a proposed development.

Where a proposed development may have an impact on a defined SEPP 14 wetland, guidelines of this policy are to be applied to minimise the impact on water quality and quantity, native flora and fauna to protect the SEPP 14 wetland. The proponent of the proposed development is required to identify safe guards (including buffers) and rehabilitation of habitat as may be appropriate in each case.

The aim of this policy is to ensure that the coastal wetlands are preserved and protected in the environmental and economic interests of the Sate.

Specific areas of consideration are:

- (a) the environmental effects of the proposed development, including the effect of the proposed development on:
  - (i) the growth of native plant communities.
  - (ii) the survival of native wildlife populations,
  - (iii) the provision and quality of habitats for both indigenous and migratory species,
  - (iv) the surface and groundwater characteristics of the site on which the development is proposed to be carried out and of the surrounding area, including salinity and water quality,
- (b) whether adequate safeguards and rehabilitation measures have been, or will be, made to protect the environment,
- (c) whether carrying out the development would be consistent with the aim of this policy,
- (d) the objectives and major goals of the "National Conservation Strategy for Australia" (Australian Government Publishing Service, 1984) in so far as they relate to wetlands and the conservation of "living resources" generally.
- (e) whether consideration has been given to whether any feasible alternatives exist to the carrying out of the proposed development (either on other land or by other methods) and if so, the reasons given for choosing the proposed development,
- (f) any representations made by the Director of National Parks and Wildlife in relation to the development application, and
- (g) any wetlands surrounding the land to which the development application relates and appropriateness of imposing conditions requiring the carrying out of works to preserve or enhance the value of those surrounding wetlands.

Of particular importance is the identification of a practical wetland buffer zone that takes into account the proposed mitigation measures, the identification of appropriate restoration measures and the impact of stormwater runoff within the wetlands catchment.

This policy is specifically addressed in Section 4.2.2.1- Riparian zone buffering, part (c) Bevian Wetland, of this report. Specific rehabilitation measures are identified within the Ecological Site Management Plan (Conacher Travers 2007b)

## 2.2.6 Other relevant state policies

## 2.2.6.1 NSW Coastal Policy

The NSW Coastal Policy broadly conforms to Ecologically Sustainable Development (ESD) Principles and recognises the importance of controlling public access to fragile coastal environments (NSW Coastal Policy 1997). Key points under this policy of relevance to the subject site and requiring consideration are:

- Conservation of biological diversity and ecological integrity
- Protection of the health, diversity and productivity of the environment is maintained and in some cases enhanced as a part of inter-generational integrity
- Incorporation of environmental costs within the development
- Utilisation of the precautionary principle in setting guidelines on ecosystem health and function

These policies are specifically addressed in Section 4.3.2.1 - Water related policies, of this report. The outcomes of all measures to protect biodiversity and ecological integrity within the site are identified within the Ecological Site Management Plan (Conacher Travers 2007b).

## 2.2.6.2 Wetlands Management Policy

The NSW Wetlands Management Policy forms a component of the NSW Rivers and Estuaries Policy which has the objective of providing guidance on the responsible use of water and the rehabilitation and best management practices of wetlands. The NSW Wetlands Management Policy aims to halt or where possible reverse;

- Loss of wetland vegetation;
- Declining water quality;
- Declining natural productivity;
- Loss of biological diversity; and
- Declining natural flood mitigation.

The NSW Wetlands Management Policy also encourages projects and activities, which restore the quality of the State's wetlands, this includes;

- Rehabilitating wetlands;
- Re-establishing vegetation buffer zones around wetlands; and
- Ensuring adequate water to restore wetland habitats.

This policy is specifically addressed in Section 4.3.2.1 - Water related policies and 4.2.2.1 - Riparian Zone Buffers, part 9c) Bevian Wetland.

## 2.2.6.3 Estuary Management Policy

The Estuary Management Policy forms a component of the State Rivers and Estuaries Policy. The general goal of the Estuary Management Policy is to achieve an integrated, balanced, responsible and ecologically sustainable use of the State's estuaries which form a

key component of coastal catchments. Specific objectives of the Policy (NSW Government, 1992) are:

- 1. The protection of estuarine habitats and ecosystems in the long term, including maintenance in each estuary of the necessary hydraulic regime;
- 2. The preparation and implementation of a balanced long term management plan for the sustainable use of each estuary and its catchment, in which all values and uses are considered, and which defines management strategies for:
  - Conservation of aquatic and other wildlife habitats
  - Conservation of the aesthetic values of estuaries and wetlands
  - Prevention of further estuary degradation
  - Repair of damage to the estuarine environment
  - Sustainable use of estuarine resources, including commercial uses and recreational uses as appropriate

This policy is specifically addressed in Section 4.3.2.1 - Water related policies of this report.

## 2.2.6.4 NSW State Rivers and Estuary Policy

The intention of the NSW Rivers and Estuaries Policy (1992) and its component policies are to:

- Coordinate and resolve disparate state agency objectives, and their integration with Total Catchment Management principles and activities.
- Protect or manage ecosystem processes and associated values.
- Engender commitment to resource sustainability, consciously balanced against other social and economic values in resource management decisions.
- Ensure rivers and estuaries continue to provide a quality environment, supporting a full range of community needs and amenities.

This policy is specifically addressed in Section 4.3.2.1 - Water related policies of this report.

#### 2.3 NATIONAL LEGISLATIVE REQUIREMENTS

## 2.3.1 Environment Protection and Biodiversity Conservation Act (1999)

The Act provides an assessment and Commonwealth approval system for actions that have a possible significant impact on matters of national environmental significance (NES). These may include:

- Wetlands protected by international treaty (the Ramsar Convention)
- Nationally listed threatened species and ecological communities
- Nationally listed migratory species

Actions are projects, developments, undertakings, activities, and series of activities or alteration of any of these. An action that needs Commonwealth approval is known as a controlled action. A controlled action needs approval where the Commonwealth decides the action would have a significant effect on a NES matter.

The proponent is required under the EPBC Act (199) to refer an application to the Department of environment and Water Resources (Previously Department of Environment and Heritage). Where a proposed activity is located in an area identified to be of NES, or such that it is likely to significantly affect threatened species, ecological communities, migratory species or their habitats. This application determines whether the proposed action is a 'controlled action' requiring separate approval by the Department of Environment and Water Resources.

This Act is specifically addressed in Section 4.1.2.1- Threatened species conservation of this report and Section 4.6.2, 4.11.2 of the Flora and Fauna Assessment (Conacher Travers 2007a).

## **SECTION 3 DGR - KEY ECOLOGICAL ISSUES**

## 3.1 ENVIRONMENTAL PROTECTION

## 3.1.1 Description of existing flora and fauna, vegetation communities and habitats

An extensive description of the flora and fauna, vegetation communities and habitats recorded within the subject site has been comprehensively described within the *Flora and Fauna Assessment Report* (*Conacher Travers* 2007a). In summary the following ecological features have been recorded within the site:

#### 3.1.1.1 Flora

A total of two hundred and eighty four (284) flora species were observed within the subject site. Of these, two hundred and twenty two (222) species were native and sixty two (62) species were exotic. The native species observed consisted of twenty nine (29) trees, forty three (43) shrubs, one hundred (100) groundcovers, twenty six (26) vines, twenty two (22) waterplants and two (2) epiphytes. Flora recorded within the subject site are listed in Table A1.1, Appendix 1 of the *Flora and Fauna Assessment Report* (*Conacher Travers* 2007a).

The Flora and Fauna Assessment Report (Conacher Travers, 2007a) concluded that:

## <u>Threatened Species Conservation Act 1995</u>

No threatened flora species listed under the *Threatened Species Conservation Act 1995* have been recorded within the site.

## Environment Protection and Biodiversity Conservation Act 1999

No threatened flora species listed under the *Environment Protection and Biodiversity Conservation Act 1999* have been recorded within the site.

## 3.1.1.2 Fauna

A total of one hundred and twenty one (121) fauna species were recorded within the subject site. This included eighty six (86) birds, twenty two (22) mammals, five (5) reptiles, seven (7) amphibians and one (1) fish species. Fauna recorded within the subject site are listed in Table A1.4, Appendix 1 of the *Flora and Fauna Assessment Report* (*Conacher Travers* 2007a).

The Flora and Fauna Assessment Report (Conacher Travers, 2007a) concluded that:

## Fisheries Management Act 1994

No threatened fauna species listed under the *Fisheries Management Act 1994* were recorded within the site.

## Threatened Species Conservation Act 1995

Six (6) threatened fauna species listed under the *Threatened Species Conservation Act* 1995 have been recorded within the site, these are: Powerful Owl (*Ninox strenua*), Glossy Black-Cockatoo (*Calyptorhynchus lathami*), Eastern Freetail-bat (*Mormopterus norfolkensis*), Greater Broad-nosed Bat (*Scoteanax rueppellii*), Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis* and Yellow-bellied Glider (*Petaurus australis*).

## Environment Protection and Biodiversity Conservation Act 1999

No threatened fauna species listed under the *Environment Protection and Biodiversity Conservation Act 1999* have been recorded within the site.

## 3.1.1.3 Vegetation communities

The following nine (9) vegetation communities and three (3) variations were identified within the subject site (Table1, Figure 3) using aerial photographic interpretation and comprehensive ground survey.

Table 1 - Vegetation communities within the subject site

Vegetation community No.	Vegetation Community Title	Existing extent (ha)		
1	Spotted Gum/Ironbark Open Forest	15.76		
2	Blackbutt Woodland	2.92		
3	Dry Gully Rainforest (Preliminary EEC under the <i>EPBC Act</i> 1999)	0.52		
4	Banksia Scrub	1.28		
5	Swamp Oak Open Forest (Core Quality Swamp Oak Floodplain Forest EEC - TSC Act 1995)	4.48		
*5a	Disturbed Swamp Oak Open Heath (Low Quality Swamp Oak Floodplain Forest EEC - <i>TSC Act</i> 1995)	1.62		
6	Aquatic Herbfield	1.24		
*6a	Natural Freshwater Wetland (Core Quality Freshwater Wetlands on Coastal Floodplains EEC - TSC Act 1995)	5.94		
7	Grassland with Scattered Trees	146.68		
8	Disturbed Redgum Open Woodland (Low Quality Riverflat Eucalypt Forest on Coastal Floodplains EEC - TSC Act 1995)	2.05		
9	Closed Swamp Paperbark Scrub (Core Quality Swamp Oak Floodplain Forest EEC - <i>TSC Act</i> 1995)	0.09		
*9a	Disturbed Swamp Paperbark Open Heath (Low Quality Swamp Oak Floodplain Forest EEC - <i>TSC Act</i> 1995)	5.04		
* Denotes vegetation community variation				

## 3.1.1.4 Endangered Ecological Communities

## Threatened Species Conservation Act 1995

Three (3) endangered ecological communities listed under the *Threatened Species Conservation Act 1995* have been recorded within the site, these are: Swamp Oak Floodplain Forest, River Flat Eucalypt Forest on Coastal Floodplains and Freshwater Wetlands on Coastal Floodplains.

## **Environment Protection and Biodiversity Conservation Act 1999**

One (1) preliminary listed endangered ecological community under the *Environment Protection and Biodiversity Conservation Act 1999* has been recorded within the site, Dry Gully Rainforest.

#### 3.1.1.5 Fauna Habitats

A range of fauna habitats exist throughout the site and include:

- Remnant stands of Blackbutt / Woodland;
- Remnant stands of Spotted Gum Open Forest;
- Some dense but generally sparse shrublayer;
- High density ground cover dominated by natives in unimproved pasture areas;
- Nectar producing plants, principally Banksia and Acacia;
- Tree hollows with remnant trees on site;
- Spare fallen timber and hollow logs;
- Generally loose soil suitable for burrowing;
- Sparse to moderate litter layer within remnant vegetation;
- Aquatic Habitats within farm dams, ephemeral watercourses and Bevian Wetland;
- Extensive grassland with scattered trees;
- Dwellings, sheds and landscaped gardens;
- Waste abandoned nursery and dilapidated dairy sheds.

These habitats are described in greater detail in Section 4.10 of the *Flora and Fauna Assessment Report* (*Conacher Travers* 2007a). The Maintain and Improve Test as required by DECC, comprehensively identifies suitable habitat types for all the recorded and potential threatened species and endangered ecological communities.

## 3.1.2 Proposed development impact assessment in response to specific DGRs

## 3.1.2.1 Conservation of threatened species

DGR
4.1

Address measures for the conservation of animals and plants and their habitat within the meaning of the Threatened Species Conservation Act (1995) having regard to the Draft Guidelines for Threatened Species Assessment (DEC & DPI July 2005). Address the measures for the conservation of aquatic species within the meaning of the Fisheries Management Act (1994)

The conservation of threatened species and their habitat has been specifically addressed within the *Flora and Fauna Assessment Report (Conacher Travers,* 2007a). A summary is provided below:

## Part 3A EP&A Act 1979 maintain/improve assessment

## Endangered Ecological Communities

The application of the maintain and improve assessment for Swamp Oak Floodplain Forest (SOFF), Riverflat Eucalypt Forest on Coastal Floodplains (RFEFCF) and Freshwater Wetlands on Coastal Floodplains (FWCF), Tables 3-5 respectively, resulted in a maintained or improved outcome for all endangered ecological communities identified within the site. Specifically, an improvement in both the condition and overall extent will be achieved through the restoration and revegetation of endangered ecological communities SOFF and RFEFCF.

The total extent of SOFF will improve from 11.23ha to 14.46ha, whilst the total area of core condition vegetation will improve from 4.57ha to 12.41ha.

The total extent of RFEFCF will improve from 2.05ha to 2.43ha, whilst the total area of core condition vegetation will improve from 0ha to 1.61ha.

The total extent and condition of FWCF will be maintained at 5.94ha.

All endangered ecological communities recorded on site will be protected from indirect impacts such as stormwater runoff through the implementation of bio-swales along road sides, bio-retention basins, gross pollutant traps and the revegetation of watercourses.

As such it is considered that the Bevian Road Concept Application will result in a net improvement in the extent and condition of SOFF and RFEFCF and will maintain the extent and condition of FWCF endangered ecological communities recorded within the subject site.

#### Threatened Flora

The application of the maintain and improve assessment for *Aldrovanda vesiculosa* and *Correa baeuerlenii*, Tables 7 & 8 respectively, resulted in a maintained or improved outcome for all threatened flora species with the potential to occur within the site.

The total extent of suitable habitat for *Aldrovanda vesiculosa* will be maintained within the Bevian Wetland.

A significant improvement in overall extent of suitable habitat for *Correa baeuerlenii* will be achieved from the existing 18.68ha to 42.8ha. This is a result of the revegetation works across the site, which will create ecological corridors through the replanting of Spotted Gum/Ironbark Forest and Blackbutt Woodland.

As such, the Bevian Road Concept Application will result in maintained or improved suitable habitat for threatened flora species with the potential to occur within the subject site.

## Threatened Fauna

The application of the maintain and improve assessment for threatened fauna, Tables 10-29, resulted in a maintained or improved outcome for all threatened fauna species known to occur or with the potential to occur within the site.

Habitat types used for the assessment were based on natural vegetation communities listed in Table 2 of this report, with the exception of the Grassland with Scattered Trees vegetation community.

The Grassland with Scattered Trees vegetation community, which covers approximately 78% (146.68 ha) of the site (Figure 6) has been excluded from the assessment based on its disturbed nature. 142.62 ha of this community will be removed as a result of the proposed development. This habitat is not considered to be significant to the lifecycle of any threatened fauna species for the following reasons:

- Grassland with Scattered Trees habitat is considered to be of low quality due to past agricultural associated clearing and current grazing by cattle. Weed incursions are extensive across the majority of this habitat.
- The Grassland with Scattered Trees habitat is considered to provide a limited foraging resource only and as such provides marginal habitat.
- The majority of the threatened fauna likely to utilise the Grassland with Scattered Trees habitat are considered to be highly mobile and would be unlikely to utilise the subject site exclusively.
- Surrounding farmlands to the north and west of the site provide similar cleared lands with scattered trees suitable for foraging.

- Any hollow bearing trees identified within the Grassland with Scattered Trees habitat
  will be retained within the post development landscape or replaced at a ratio of 2:1 in
  conservation zones within the subject site.
- Areas of cleared foraging land will be retained across the site in the form of open space/recreation areas and larger lots
- Compensatory habitat will be provided within the site including the revegetation of Ecological Corridors 1 & 2 (Schedule 1 - Restoration Management), which will create new vegetation linkages between remnants within the site and vegetation offsite and the retention and restoration of the Southern Conservation Zone (Schedule 1 -Restoration Management).

As such, the Bevian Road Concept Application will result in a net improvement in suitable habitat and vegetation connectivity for all threatened fauna species known to occur, and with the potential to occur, within the subject site. Any losses in Grassland with Scattered Trees habitat are considered to be insignificant.

## Native Vegetation Act (2003) and Regulations

Under the *Native Vegetation (NV)* Act (2003) and Regulations gazetted in December 2006, native vegetation protected under the Act, likely to be impacted by a development, may require a referral to the relevant CMA. However, given that the Rosedale development application is being considered under Part 3A of the *EP&A* Act (1979), the following exemption applies:

Section 75U of the EP&A Act (1979) states that approval under section 12 of the NV Act (2003) is not required for clearing of native vegetation.

The Minister may still choose to refer the development proposal application to the relevant CMA (in this case Southern Rivers CMA).

Liaisons with Donna Hazel, Native Vegetation Coordinator, of the Southern Rivers CMA on the 19 April 2007, advised that if the project is referred to the CMA, a simulated assessment may be undertaken for the site to determine whether or not a maintain or improve outcome could be achieved.

Three of the four zonings within the site are potentially caught by the *NV Act* (2003). These are: Zone 1c - Rural Small Holdings (6.84ha), Zone 1a - Environmental Constraints (15.58ha) and Zone 7a - Environment Protection - wetlands (8.31ha). Subsequent advice from the Department of Planning originating from the CMA, has identified that land zoned 10 - Urban Expansion (159.11ha) is also covered under the NV Act (2003).

The Threatened Species Assessment Guidelines for 3A applications require the completion of a maintain or improve test which is based on the Biometric Assessment Guidelines in particular the method of determining the condition of Endangered Ecologically Communities. This assessment identified that that there is unlikely to be any significant impacts from the proposed development on threatened species or endangered ecological communities

The removal of native vegetation within the site has been is assessed under the provisions of Part 3A of the EP&A Act 1979. This assessment supersedes the requirements of the Native Vegetation Act 2003. This assessment has found that a maintain or improve outcome has been achieved for the entire site as a result of significant restoration works to establish the ecological corridors (1 & 2) and the southern conservation zone (Schedule 3 – Restoration Schedule).

In order to ensure that a positive outcome is achieved overall for on site a net positive outcome of an additional 13.5 hectares of native vegetation (Largely Spotted Gum Forest) will be regenerated onsite. There will also be a net increase in high quality habitat for Endangered Ecological communities ensuring a maintain outcome.

## Vegetation to be Removed

Vegetation to be removed will occur in the following circumstances (Schedule 4 – Tree management):-

- 1. Removal of disturbed EEC's for the purposes of the development, roads and cut and fill. Note disturbed EEC vegetation is offset at a 1:1 ratio by the restoration of the same vegetation type within the Southern Conservation Zone.
- 2. Removal of trees for the purposes of roads, services and building envelopes. Note all trees will be retained where possible and significant habitat trees will be assessed for the submission of relevant development applications.
- 3. Modification of understorey within asset protections zones to the fuel load standards for inner and outer protection areas.

The development footprint has been designed to avoid the removal of good quality native vegetation and minimise the impact of asset protection works on the existing understorey. Given that the majority of the site has been managed in the past resulting in largely a sparse canopy line, the majority of canopy vegetation can be retained and still be compliant with the fuel load standards for asset protection zones. Schedule 4 illustrates that the impact of the proposed development on existing vegetation has been minimised. In addition, the maintain and improve test has identified that a maintain or improve outcome will be achieved.

In accordance with the Ecological Site Management Plan (*Conacher Travers* 2007) the presence of habitat trees will be managed by identifying the relative habitat value of each tree based on hollow dimensions (utilising the Biometric Survey Method) and prioritising the retention of high quality "Ecologically Significant Trees". Any habitat trees removed will be compensated by replacing with artificial nest boxes throughout the landscape for a variety of fauna species in particular owls, arboreal gliders and microbats.

## SEPP 44 – Koala Habitat Protection

One (1) Koala food tree species (*Eucalyptus tereticornis*) listed on Schedule 2 of State Environmental Planning Policy No. 44 - Koala Habitat Protection (SEPP 44), was observed within the subject site. This species made up <10% of trees within the site. This is less than the 15% required by SEPP 44 for classification as Potential Koala Habitat. Therefore the subject site is not considered to contain 'Potential Koala Habitat' as defined by SEPP 44.

No Koalas or secondary evidence of habitation were observed during the fauna survey. A search of the Atlas of NSW Wildlife (DEC 2006) database found no records of Koala habitation within a 10 km radius from the study area.

The potential impacts of the proposed development on the Koala were specifically addressed in Section 5 - Maintain or Improve Assessment (Table 20) of the *Flora and Fauna Assessment Report* (*Conacher Travers* 2007a). The results of this assessment were that the potential foraging habitat for Koala would be improved and no significant impacts would occur as a result of the proposed development.

Based on the absence of Potential or Core Koala habitat within the subject site and the improved outcome for potential Koala Habitat, the Concept Application is unlikely to have any negative impacts on the Koala.

## Yellow bellied Glider Policy (specific to Broulee area)

Broulee is located approximately 5km to the south, south-west of the subject site and is separated by the Tomaga River. As such this policy does not specifically apply to the land within the subject site. However, given that a Yellow-bellied Glider has been recorded within the subject site (*Gunninah Environmental Consultants* 2002) the objectives of the policy have been considered.

The Concept Application will conserve Yellow-Bellied Glider habitat through the retention of remnant vegetation within the site, in particular important habitats such as the Spotted Gum/Ironbark Forest and Blackbutt Woodland will be retained, protected and rehabilitated within the ecological corridors. The creation of vegetation connectivity will provide for an improvement in Yellow-bellied Glider movement throughout the site and surrounding lands. The installation of powerlines underground will also reduce the risk of electrocution to Gliders.

A maintain or improve test (Section 5 of the Flora and Fauna Assessment Report, *Conacher Travers*, 2007a) found that habitat for this species would be improved and no significant impacts would be associated with the proposed development.

The Bevian Road Concept Application is considered to exceed the objectives of the Yellow bellied Glider Policy through the retention, protection, revegetation and improvement of vegetation connectivity within the Ecological Corridors. Conacher Travers concludes that this project will enhance the long-term survival of Yellow-bellied Gliders within the Eurobodalla LGA.

## DGR 4.1 - Conclusion

A maintained or improved result has been achieved for threatened flora, endangered ecological communities and a number of threatened fauna species known to occur or with the potential to occur within the site. The loss of Grassland with Scattered Trees vegetation community is not considered to be significant to the lifecycle of any threatened species or endangered ecological community.

The implementation of the following mitigation measures will result in the protection of threatened flora and fauna species and endangered ecological communities known to occur or with the potential to occur within the site:

- Exclusion of existing cattle grazing;
- Weed control:
- Erosion control:
- Installation of protective fencing and signage;
- Stormwater Quality and Quantity Control (Bio-retention basins, bio-swales, gross pollutant traps, rainwater tanks and revegetation of watercourses);
- Retention of Dead Timber and Habitat Supplementation;
- Retention of Regrowth;
- Creation of vegetation corridors;
- Retention or replacement of all hollow bearing trees; and
- Strategic Supplementary Planting

As such, the Bevian Road Concept Application adequately meets the requirements of the Draft Guidelines for Threatened Species Assessment (DEC & DPI July 2005) and the provisions of the Threatened Species Conservation Act 1995.

## 3.1.2.2 Vegetation connectivity

DO	ЭR
4	2

Outline the measures for the conservation of existing wildlife corridor values and/or connective importance of vegetation on the subject land, including areas identified as being of high and/or very high ecological status.

Currently there is no vegetation connectivity between native remnants within the site, but extensive areas of vegetation are present on all sides of the site.

The Concept Application has responded to the ecological constraints identified within the site (Figure 3). Schedule 3 – Restoration Plan, identifies those areas designated for protection and restoration.

## Proposed Ecological Corridor 1

Ecological Corridor 1 (Schedule 3 – Restoration Management Plan) will form the northern most, east-west corridor, within the site and incorporates a category 3 watercourse which drains to Saltwater Creek. A number of dams have been constructed along the watercourse within this corridor which will be retained. Ecological Corridor 1 will link vegetation within the Mogo State Forest adjoining the western boundary with vegetation adjoining the eastern boundary of the site.

The revegetation and regeneration of this corridor will also provide connectivity between Spotted Gum / Ironbark Forest on the eastern boundary of the site and the northern boundary (Schedule 3 – Restoration Management Plan).

## Proposed Ecological Corridor 2

Ecological Corridor 2 (Schedule 3 – Restoration Management Plan) will form a southern, east-west corridor which incorporates "The Knoll". This corridor is 40% watercourse and 60% ridgeline providing a variety of habitats such as Banksia Scrub, Spotted Gum / Ironbark Forest and Blackbutt Woodland.

#### Southern Conservation Zone

The Southern Conservation Zone (Schedule 3 – Restoration Management Plan) specifically aims to buffer and restore endangered ecological communities (Swamp Oak Forest and River-Flat Eucalypt Forest on Coastal Floodplains) associated with Bevian Wetland. This area of restoration is of particular importance in that it achieves a net improvement in endangered ecological community habitat within the site.

## Stepping stones to vegetation corridors

The subdivision has been designed to provide significant vegetated corridors that separate the main development zones. Native landscaping throughout the development including areas of open space and street plantings will provide stepping stones to the ecological corridors. The result being improved ecological functioning of the corridors, the watercourses that contain fauna movement and the genetic transfer of plant material.

#### DGR 4.2 - Conclusion

Based on the restoration of the proposed Ecological Corridors 1 & 2, Southern Conservation Zone and native landscaping across open space areas and streets, it is considered that the Concept Application will result in an improvement in vegetation connectivity across the site. The improved vegetation connectivity across the site will assist fauna movement and the genetic transfer of plant material.

## 3.1.2.3 Environmental Conservation Zone 2 (E2)

DGR 4.3 Demonstrate how the proposal will allow for the future transition of areas of high environmental conservation values to the new Environmental Conservation Zone 2 areas under the LEP template, particularly in relation to riparian corridors, wetlands and areas containing Endangered Ecological Communities (EEC).

The ecological precincts (Figure 5 – Precinct Plan) identified within the subject site will be zoned into the new Environmental Conservation Zone (E2) as recommended within the South Coast Sensitive Urban Lands Review (Refshauge et al 2006). This zone is part of the Standard Instrument (LEP) Order 2006, which states the following objectives for the zone:

- To protect manage and restore areas of high ecological, scientific, cultural or aesthetic values, and
- To prevent development that could destroy, damage or otherwise have an adverse effect on those values.

The following types of development are prohibited in Zone E2 – Business premises, Hotel accommodation, Industries, Multi dwelling housing, Recreation facilities (major), Residential flat buildings, Retail premises, Seniors housing, Service Stations, Warehouse or distribution centres. The proposed ecological corridors 1 and 2, the southern conservation precinct and protected remnants will form the major part of the environmental Conservation Zone (E2).

Application of the E2 zoning within the site would require an amendment to the existing Eurobodalla Rural Local Environment Plan (1987) and preparation of a site specific DCP for future planning control of future developments applications onsite. The Conservation and Land Use Plan (CLUMP) forms an essential component of the DCP to ensure that future development is consistent with the ecological and bushfire considerations that aim to achieve a balanced and ecologically sustainable conservation and land use outcome.

## DGR 4.3 - Conclusion

Through the incorporation of conservation zones and ecological corridors the Concept Application will result in an overall improvement in the ecological functioning of the landscape. The eventual rezoning of these areas into E2 zones will solidify the commitment to creating a sustainable development.

#### 3.2 RIPARIAN MANAGEMENT

Assessment of potential impacts from the proposed development on the riparian zones has been undertaken across three key zones including:

- (a) Watercourses (including dams)
- (b) Intermittent Closing and Opening Lake or Lagoons (ICOLL) Saltwater Creek
- (c) Bevian Wetland

## 3.2.1 Description of Existing Drainage Lines and Wetlands

## (a) Drainage lines

The subject site is situated on gently undulating to steep land and contains a network of minor ephemeral tributaries. The site is divided into two catchments (Figure 9). The northern half, referred to as 'Salt Water Creek Catchment' and the southern half referred to as the 'Barlings Beach Catchment'. A ridge passing through the centre of the site forms the boundary between the two catchments, which also applies to shallow subsurface flows.

The Saltwater Creek catchment forming the northern section of the subject site contains the upper tributaries of Saltwater Creek, which discharge over Barling's Beach into the South Pacific Ocean. This catchment drains from several small drainage lines containing several dams, and flows generally to the south east to Saltwater Creek.

The catchment of Bevian Wetland forms a large portion of the Barlings Beach Catchment. One drainage corridor is located to the north west of the Bevian Wetland and contains a small farm dam after which the drainage line is not defined as it enters a floodplain. The north eastern section of the Bevian Wetland catchment contains a floodplain with no defined drainages.

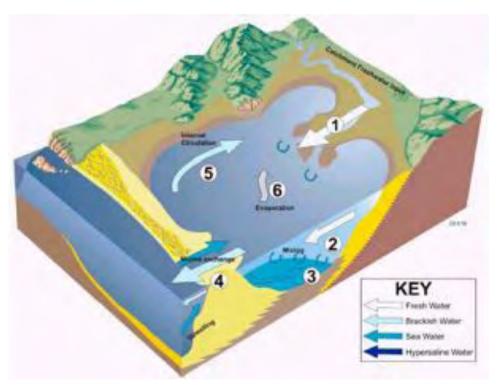
Watercourses within the subject site (Figure 3) were assessed by the DNR representative, Mr Bob Britten, on the 22 November 2006. As a result of this inspection all Watercourses were given a Category 3 watercourse rating. Category 3 watercourses require a riparian buffer of 10 metres from 'top of bank' on both sides of the channel. Core riparian zones within the subject site are currently degraded and in most instances consist of pasture Blackberry and remnant native vegetation. The inspection also revealed that whilst there was heavy bank erosion, the "top of bank" was not identifiable (Schematic 2 – Proposed Riparian Management Concept, Section 4.2.2.1). A detailed riparian buffer analysis has been illustrated on Figure 8, 8.1, 8.2, 8.3, 8.4, 8.5.

## (b) Intermittent Closing and Opening Lake or Lagoon (ICOLL)

Saltwater Creek (Figure 9) is recognised as an Intermittently Closing and Opening Lake or Lagoon, (ICOLL) (Refshauge *et al* 2006; Mackenzie *et al* 2002). An ICOLL is characterised by a coastal barrier at the mouth of the lake, which creates a broad basin. The barrier periodically opens and closes allowing sporadic exchange of water between the lake basin and the sea (Ryan *et al* 2003). Saltwater Creek is a brackish creek ICOLL.

Saltwater Creek ICOLL is predominately closed to the ocean, meaning that the majority of water supplied to the system is from fresh water fluvial sources (Schematic 1). The Creek flows from the hinterland through coastal urban areas into a coastal lake and forms an important ecological link between terrestrial ecosystems and marine ecosystems (Mackenzie et al 2002). The northern portion of the subject site forms part of the catchment to the Saltwater Creek ICOLL and as such water moving from the site has the potential to impact of this system.

Barlings Beach is also technically an ICOLL given that a sand barrier exists on the beach. However the associated lagoon system is now part of the Barlings Beach Holiday Village and is largely an artificial but stabilised channel lagoon. Given the presence of significant dune vegetation at the mouth, *Conacher Travers* considers this ICOLL to be largely inactive. Swamp Oak Vegetation that is inundated in high rainfall events exists upstream and immediately adjacent to George Bass Drive but it does not occur within the Barlings Beach Holiday Village.



Schematic 1: Hydrodynamics of an ICOLL (Ryan et al., 2003)

## (c) Bevian Wetland

Bevian Wetland is recognised as SEPP 14 Wetland No. 194 by the NSW Department of Planning and Eurobodalla Shire Council.

The wetland is currently fringed by vegetation, which forms two endangered ecological communities, *Swamp Oak Forest on Coastal Floodplains* and River Flat Eucalypt Forest on Coastal Floodplains. The south eastern flats of Bevian Wetland also contain *Bangalow Sand Forest* (Figure 6 – Vegetation Communities). The Freshwater wetland vegetation within Bevian Wetland forms an endangered ecological community – *Freshwater Wetlands on Coastal Floodplains*.

Bevian Road currently runs from George Bass Drive along the western edge of this wetland into the site. This unsealed road is proposed to be upgraded and form the main southern access to the future development.

The water levels within the wetland fluctuate depending on annual rainfall events. Water quality appears to be good however; nutrients and sediments may be delivered to the wetland during times of heavy rainfall. The aquatic vegetation within Bevian Wetland also indicates a weak saline water influence.

#### 3.2.2 Proposed development impact assessment in response to specific DGRs

## 3.2.2.1 Riparian Zones

DGR	In accordance with the objectives of the draft Eurobodalla Riparian Corridor Study (RCOS) address riparian zone buffering to the wetland and drainage lines
5.1	demonstrating how they will be protected and how the downstream environment will not be adversely affected by the proposed development.

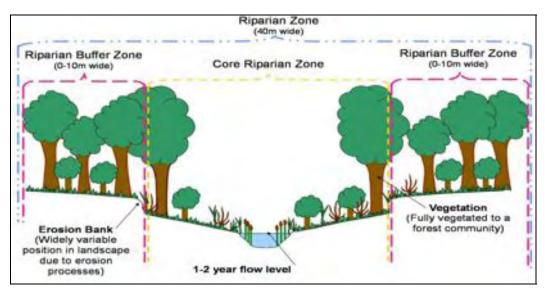
All watercourses within the site (Figure 3) have been given a Category 3 classification by the Department of Natural Resources. These Category 3 watercourses are depicted on Figure 3 – Constraints Plan. Site inspections with DNR representative, Bob Britten, identified that the "top of bank" was not distinct on the main watercourses due to past erosional history and a lack of stabilising vegetation. Given the lack of a defined 'top of bank' (Section 3.2.1(a)) an alternative riparian management concept was needed to ensure that the watercourse was protected and met the primary functions of a 'stable' watercourse, which contained at a minimum, the 1:2 year flow level.

The 1:2 year flow level is "technically" considered to represent the top of bank in the absence of a defined "top of bank". In addition, the containment of the erosion bank within the total protected riparian zone was considered an important benchmark to achieve. Given the absence of a defined 'top of bank' and consultation undertaken both on and off site with DNR, it was agreed that a reduced riparian buffer would be accepted by DNR at "pinch points". The riparian buffer generally extends greater than 10 beyond the top of the erosion bank but is reduced to 2.5m at pinch points. As shown on Figures 8, 8.1, 8.2, 8.3, 8.4 & 8.5, the majority the riparian zone has a riparian buffer exceeding 10 metres. At the pinch points the edge of the buffer would be landscaped within the asset protection zone to provide equivalent protection to a distance of 10 m from the erosion bank (Figure 8, 8.1, 8.2, 8.3, 8.4 & 8.5).

The *Marsim Group Pty Ltd* master planning team has undertaken consultation with DNR to confirm the suitability of the proposed riparian zones.

Riparian zones within the subject site have been divided into two sub-zones (Schematic 2):

- 'The Core Riparian Zone' considered to be the area of land between the top of the erosion bank on either side of the watercourse, and
- 'The Riparian Buffer Zone' is the variable area of land from the top of the erosion bank with a minim of 2.5 m to a maximum of 30m (Schematic 2). The width of the buffer being determined by site characteristics and provision of asset protection zones.



**Schematic 2:** Proposed riparian management concept representing the minimum level of protection given to a category 3 watercourse. Dimensions may vary depending on the locality.

The width of the Riparian Zone throughout the subject site has been determined on a case by case basis to ensure an adequate buffer is provided along the entirety of each watercourse. Due to variations in the level of erosion, the erosion in some cases is on the outer edge of the riparian buffer, and in other cases close to the core riparian zone edge. The primary aim being to ensure that the "erosion bank" was contained within the total riparian zone.

## (a) Drainage lines

Defined watercourses and channels within the site have been identified as per the *Rivers and Foreshores Improvement Act 1948*. As a result of the DNR site inspection on site on the 22 November 2006 all "water courses" (as defined under the R&FI Act) were classed as Category 3 watercourses and as such a general riparian buffer zone of 10 metres was required either side of these channels from 'top of bank'. Reductions at Pinch points are permissible with appropriate landscaping to an equivalent of 10m. From this assessment five watercourses as opposed to overland flow zones, were identified within the site. Watercourse 1 forms part of the northern most riparian zone, situated in the northern Saltwater Creek Catchment. Watercourse 2 forms the second major riparian zone in the northern Saltwater Creek Catchment. Watercourse 3 forms the eastern watercourse also draining to Saltwater Creek.

Watercourse 4 and 5 represent the upper most extent of category 3 watercourses which collect overland flows from the southern catchment. Watercourses in the southern catchment are not defined by well formed channels but collect significant surface and sub-surface drainage after heavy rainfalls. A flowing stream is evident at the inflow to Bevian Wetland after heavy rainfall.

Watercourse 4 extends on a north westerly direction upslope from Bevian Wetland which contains remnant Swamp Oak Forest (good and low condition vegetation). This Watercourse has been given significant protection in the form of a removed buffer due to the quality of water after heavy storm events.

Watercourse 5 extends to a lesser extent in a northerly direction. Due to lower grades, surface water tends to collect on the flats and slowly drains to Bevian Wetland. Significant restoration of the lower flats is proposed in recognition of the low quality Swamp Oak and River Flat Forest vegetation currently regenerating.

Those drainage lines, as distinct from watercourses, that are considered to form overland flow zones will be managed through the implementation of water sensitive urban design principles incorporating best practice storm water management measures.

All watercourses will be regenerated or revegetated in order to re-establish functional riparian corridors. Watercourse 4 and 5 in the southern catchment will be largely left to regenerate in recognition of the high level of native species within the ground layer.

Four watercourse crossings are proposed in the Concept Application (Figure 4). These crossings will be constructed so as not interrupt the natural flow of the watercourse and rehabilitated to an appropriate standard to be approved by DECC.

#### (b) Intermittent Closing and Opening Lake or Lagoon (ICOLL)

Water sensitive urban design will be implemented incorporating best practice stormwater management measures across the site. These design principles will maintain the water flows and improve the water quality entering Saltwater Creek (ICOLL).

Water sensitive urban design measures will include: gross pollutant traps, bio-retention strips and grass swales along roadsides, 10,000 litre rainwater tanks at all dwellings and various water detention measures. The combination of these water sensitive design measures upstream from the Saltwater Creek ICOLL will ensure the mitigation of any potential adverse downstream impacts.

In addition, a monitoring program is proposed to measure the performance of the water quality measures.

## (c) Bevian Wetland

The exact boundary of the SEPP 14 Wetland was ground truthed by *Conacher Travers* and previous ecological consultants using the outer edge of the existing Swamp Oak Open Forest (*Casuarina* species). This edge was mapped by differential GPS.

In addition the 'high water mark' of the wetland was surveyed, as required by DGR 5.2. The 'high water mark' was surveyed by registered land surveyors by ground truthing the contours around the entire wetland. Subsequently, *Conacher Travers* undertook a site inspection immediately after a major rainfall event (June 2007). A high watermark was clearly identified during this site inspection in the north eastern corner of the wetland where contours where sufficiently spread. A contour was chosen that was considered indicative of the high water mark from this location. This line is depicted in Figure 1 (refer to attachment) and was used to set the minimum 50 metre wetland buffer as required by DGR 5.2.

The minimum 50m buffer extends from the wetland high water mark at all aspects. The wetland buffer extends to a maximum of 200m to the north of the high water mark boundary in the Southern Conservation Zone where restoration works are proposed (Schedule 3). In addition to the wetland buffer are retention basins and asset protection zones, which function as additional buffering to the wetland.

The area surrounding the Bevian Wetland is currently vegetated with the endangered ecological communities Swamp Oak Floodplain Forest and River Flat Eucalypt Forest on Coastal Floodplains. Freshwater Wetlands on Coastal Floodplains (EEC) forms the vegetation within the wetland and Bangalow Sand Forest (EEC) occurs to the south-east (Figure 3).

Stormwater treatment measures will be installed within the southern catchment of the proposed development in a similar manner to the northern catchment to improve the water quality over existing conditions and maintain the water flows entering the Bevian Wetland. Two primary dry retention ponds basins will be installed within asset protection zones to control peak stormwater discharge and provide further settlement time for suspended sediments.

Regeneration works will be undertaken within the Swamp Oak Floodplain Forest and River Flat Eucalypt Forest to enhance these endangered ecological communities. These restoration zones will continue to function as a natural infiltration zone to Bevian Wetland.

#### DGR 5.1 Conclusion

Given the degree of separation provided few riparian zones and Bevian Wetland and the implementation of water sensitive urban design principles across the site, the Bevian Road Concept Application will achieve an overall improvement in the catchment water quality.

## 3.2.2.2 Ecological Functioning of Bevian Wetland

DCP	Outline management measures to maintain or improve the stability, water quality,			
5.2	habitat and natural function of the wetland. A core riparian zone extending at least 40			
5.2	metres from the high water mark plus a further 10 metre buffer is required.			

The Concept Application will protect the Bevian Wetland through the: protection of the wetland with a comprehensive buffer system and the mitigation of any direct impact of the proposal.

The protection measures are as follows:

Mitigation of potential impacts associated with the Bevian Road Upgrade

Bevian Road provides the only viable main access to the site from George Bass Drive and adjoins the western boundary of the Bevian Wetland. The road is currently unsealed and provides a source of potential sediments to the wetland during rainfall events.

It is proposed to maintain the existing alignment of Bevian Road as the primary southern access feeding onto the internal road network of the proposed development. This will require the upgrade of the road to a sealed carriage way. In order to ensure the protection of the wetland, the alignment of the road immediately adjacent to the western boundary of the wetland will be retained. The Road will be raised by approximately 1 m to allow for installation of stormwater filtration devices beneath the pavement at strategic points. The filtered waters will be delivered into Bevian Swamp through stabilised stormwater outlets.

Other access options such as adjoining the Rosedale STP were also considered. However as the road would need to be completely rebuilt, raised and disturb three (3) endangered ecological communities, the existing access of Bevian Road was considered to have significantly less impact. Conacher Travers has comprehensively mapped the exact boundary of the SEPP 14 wetland on its eastern edge, which demonstrate that the proposed access is immediately outside the actual wetland vegetation interfacing with Spotted Gum Ironbark Forest which is not a endangered ecological community or part of the wetland vegetation

A secondary access is also provided to the north-east of the site i.e. the other end of the Bevian Road. As this north-east access is needed as a secondary evacuation during a bushfire event, it is not possible to have only one entry. However the southern access to George Bass Drive provides to safest evacuation route that has the best visibility when approaching from a northern or southern direction.

It is considered that despite the roads close proximity to Bevian Wetland, the southern access onto George Bass Drive provides the best outcome. Given that the road is being built on a currently formed road and the wetland can be protected during construction of the road and storm water filtered, the proposed southern access is not expected to have significant adverse environmental impact.

• Protection of the SEPP 14 Wetland (No A4) – "Bevian Wetland"

The objectives of the SEPP 14 Coastal Wetlands Policy are outlined in Section 3.2.7.3 of this report.

Bevian Wetland is located within the southern portion of the subject site (Figure 3 – Ecological & Bushfire Constraints Map) and has been mapped by the NSW Department of Planning as SEPP 14 wetland no. 194. As such the proposed development is required to consider and meet the objectives of the SEPP 14 – Coastal Wetlands Policy.

Specific areas of consideration are:

- (a) the environmental effects of the proposed development, including the effect of the proposed development on:
  - (v) the growth of native plant communities.
  - (vi) the survival of native wildlife populations,
  - (vii)the provision and quality of habitats for both indigenous and migratory species,
  - (viii) the surface and groundwater characteristics of the site on which the development is proposed to be carried out and of the surrounding area, including salinity and water quality,

The Bevian Road Concept Application has considered the specific plant species and vegetation communities associated with the Bevian Wetland, which include three endangered ecological communities, *Swamp Sclerophyll Forest, River Flat Eucalypt Forest on Coastal Floodplains and Freshwater Wetlands on Coastal Floodplains.* These vegetation communities will be retained, restored protected within a buffer system as part of the subdivision layout (Figure 4). Section 5 of the *Flora and Fauna Assessment Report (Conacher Travers* 2007a), undertook a maintain or improve assessment for these vegetation communities (Table 3-5), which identified that all endangered ecological communities will be fully maintained with the proposed regeneration and revegetation of low condition endangered ecological communities.

The land surrounding the wetland and containing two of the endangered ecological communities, Swamp Sclerophyll Forest and River Flat Eucalypt Forest on Coastal Floodplains, will form the "back bone" of the restoration zone which will achieve an overall net improvement in the area of these communities. The restoration works will positively impact on the native wildlife populations providing an enlarged area of native foraging and roosting habitat adjacent to the wetland.

The wetland provides potential habitat for migratory species. The habitat for migratory species will be improved through restoration works within the vegetation surrounding the wetland and the implementation of water sensitive urban design principles that aim to improve the quality of water currently delivered to the wetlands. As such, there is unlikely to be a significant impact on any migratory birds with the potential to utilise the site.

Bevian Wetland currently undergoes a regular wetting and drying phases dominantly influenced by heavy rainfall events and supplemented by subsequent slow release of subsurface flows. The upstream low lying flat lands surrounding the wetland at its northern boundary, forms the main infiltration zone which collects subsurface flows from the southern catchment. This function has been protected by expanding restoration zones in to the over land flow zones feeding into Bevian Wetland, Given that the water sensitive urban stormwater design is predicted to result a improvement in the quality of runoff, the infiltration zones will continue to function ecologically providing a protective buffer to the proposed development. No significant change in salinity loads is expected as result of the proposed development.

(b) whether adequate safeguards and rehabilitation measures have been, or will be, made to protect the environment,

Adequate safeguards to protect the wetland and associated vegetation have been incorporated into the Bevian Road Subdivision Plan (Figure 4). These management measures include: the provision of a 50-200 metre restored native buffer to the wetland, two detention basins to the north of the wetland, providing detention of peak stormwater flows from the proposed development, the upgrade of Bevian Road from the existing unsealed surface to a stabilised pavement and the restoration of the vegetation communities surrounding the wetland.

(c) whether carrying out the development would be consistent with the aim of this policy,

The Bevian Road Concept Application is considered to be consistent with the aim of the policy, which is to ensure the preservation and protection of the wetland in the environmental and economic interests of the State.

This is achieved through the implementation of water sensitive urban design measures, development setbacks from the wetland, buffering of the wetland with restored native vegetation.

(d) the objectives and major goals of the "National Conservation Strategy for Australia" (as set forth in the second edition of a paper prepared by the Commonwealth Department of Home Affairs and Environment for comment at the National Conference on Conservation held in June, 1983, and published in 1984 by the Australian Government Publishing Service) in so far as they relate to wetlands and the conservation of "living resources" generally, copies of which are deposited in the office of the Department,

The three main objectives in conserving living resources as outlined in the *National Conservation Strategy for Australia* are:

- 1. To maintain essential ecological processes and life support systems
- 2. To preserve genetic diversity
- 3. To ensure the sustainable utilisation of species and ecosystems

The Bevian Road Concept Application incorporates the following ecological protection and enhancement measures across the site, which meets the objectives outlined above:

- Retention, protection and restoration of existing remnants within the site that support the sites critical ecological processes and life support systems.
- Revegetation of water courses to create ecological corridors that enhance the opportunities for fauna movement and foraging habitat.
- The integration of conservation precincts, open space precincts and development precincts such that the ecological functioning of the landscape is improved whilst also improving the social, visual and recreational values and residential opportunities of the site.
- (e) whether consideration has been given to establish whether any feasible alternatives exist to the carrying out of the proposed development (either on other land or by other methods) and if so, the reasons given for choosing the proposed development,

The lands associated with the Bevian Road Concept Application are zoned 10 – Urban Expansion and the site has been identified by the south-coast review commission as being a viable option for development with Rosedale Urban Expansion Zone. The proposed development will result in an improved environmental outcome for the land through the removal of livestock, restoration of vegetation communities and associated fauna habitat, revegetation of riparian zones and improvement in water quality catchment.

(f) any representations made by the Director of National Parks and Wildlife in relation to the development application, and

Key issues raised by the Department of Environment and Climate Change (DECC) with regard to the previous application for this site include:

- Environmental impacts on the SEPP 14 Wetland Bevian Swamp, notably due to stormwater and road construction:
- Environmental impacts on the foraging habitat of threatened species including the Yellow Bellied Glider and Eastern Bentwing Bat;
- Environmental impacts of pets and increased human presence on wildlife and shorebirds;
- Protection of Endangered Ecological Communities (EECs);

These issues have been addressed in the current Bevian Road Concept Application in the following ways:

- Impacts to the Bevian wetland have been addressed as per the comments provided in points (a) – (f) above. Specifically, those impacts associated with the Bevian Road upgrade have been addressed above under 'Potential impacts associated with the upgrade of Bevian Road'.
- Assessment of threatened species habitat under the maintain or improve assessment in Section 5 of the *Flora and Fauna Assessment report* (*Conacher Travers* 2007a) resulted in no significant impacts on threatened species habitats. The summary of these findings is provided in Section 4.1.2.1 of this report.
- The impact of domestic animals has been considered within the proposed development and a bylaw is proposed to exclude all cats and dogs from the development, with the exception of companion animals as defined under the *Companion Animals Act 1998*. This bylaw will be regulated under a community management title proposed for the development.
- The three endangered ecological communities associated with Bevian Wetland, Swamp Oak Floodplain Forest, River Flat Eucalypt Forest on Coastal Floodplains and Freshwater Wetlands on Coastal Floodplains, will dominantly be retained within the 50-200 metre restored buffer surrounding the wetland. The areas surrounding the wetland will form an important restoration zone (Schedule 1 Restoration Plan), which will restore the endangered ecological communities in order to achieve a net improvement in their coverage and protection.

The consideration of these previous key issues raised by the DECC and recent onsite visits and consultation undertaken with the DECC has been an important component of the current design of the Bevian Road Concept Application and it is considered that the current application adequately addresses these concerns.

(g) any wetlands surrounding the land to which the development application relates and appropriateness of imposing conditions requiring the carrying out of works to preserve or enhance the value of those surrounding wetlands.

Bevian Wetland is the only wetland within close vicinity of the proposed development. It is considered that the Bevian Road Concept Application adequately protects this wetland through the measures outlined in points (a) – (f) above. All works associated with the development will be controlled under an Ecological Site Management Plan - ESMP - (Conacher Travers 2007b), which will further ensure that protection measures are implemented prior, during and post construction phases.

#### DGR 5.2 Conclusion

The Bevian Road Concept Application adequately protects Bevian Wetland through its consistency with the objectives of the SEPP 14 — Coastal Wetlands Policy. The proposed development will apply a 50-200 metre buffer to the wetland including, an extensive restoration area for the rehabilitation of associated low condition endangered ecological communities, and the implementation of stormwater control and treatment devices within the proposed development.

## 3.2.2.3 Drainage line riparian buffer zones

DGR	A 10 metre riparian buffer zone extending from the top of bank is required to all drainage
5.3	lines within the development area.

A response has been provided to this DGR under *DGR 5.1*, *Section 3.2.2.1 Riparian Zone Buffering*, (a) *Drainage Lines*, above.

In summary, a comprehensive riparian protection area has been designed to protect the existing riparian habitat, stabilise eroding banks and protect of the quality of water consistent with a category 3 watercourse. The Marsim master planning team has undertaken consultation with DNR to confirm the suitability of the proposed riparian zones.

Figure 8 – Buffer Analysis, depicts the buffers and boundaries associated with the Category 3 watercourses. Justification for these buffers is provided below and in section 3.2.

#### DGR 5.3 Conclusion

The Bevian Road Concept Application adequately meets the DNR riparian zone requirements as agreed to during a site visit by the DNR representative Mr Bob Britten on the 22 November 2006. All buffers have been designed to provide appropriate bank stability and water quality protection.

## 3.2.3 Potential for fish passage and habitat

The Rosedale site comprises a network of intermittent watercourses and dams. Currently these dams do not provide for fish passage into the linking watercourses. Based on the current conditions it is considered that the watercourses within the site vary between the defined Class 3 - minimal fish habitat and Class 4 - unlikely fish habitat, under NSW Fisheries document *Fish Passage Requirements for Waterway Crossings* (Fairfull & Witheridge 2003). The recommended crossings types for these watercourses include culverts, causeways or fords.

One (1) aquatic species, Marbled Eel, was recorded within one of the northern dams within the site during fauna survey. It is considered that the intermittent nature of the watercourses means that they are unlikely to provide significant breeding habitat for fish species. The Bevian wetland within the site may however, provide more significant fish habitat and to a lesser extent the dams within the northern and southern catchments.

The Saltwater Creek ICOLL, which extends from the northern catchment in the subject site provides an area of significant fish habitat and during open periods will provide a breeding ground for migratory fish species into Bateman's Bay Marine Park. Therefore, suitable fish passage structures will be incorporated into the watercourses in the northern catchment, which link with the Saltwater Creek ICOLL. The design of these structures is being considered at this stage and conceptual design will be provided at a detailed design stage. A water sensitive urban design system will be implemented across the site, which will ensure that water flows leaving the site are maintained and that water quality is maintained or improved for aquatic species.

#### Conclusion

The Bevian Road Concept Application will provide for fish passage through the removal of barriers in the northern watercourses and the provision of spillways that accommodate the movement of aquatic fauna species.

#### 3.3 WATER CYCLE MANAGEMENT

## 3.3.1 Description of Existing Hydrological Processes

The proposed development has the potential to impact on two key areas of the water cycle within the subject site:

## (a) Surface Water

Water flowing from the coastal ridge that separates Rosedale from Tomakin, then divides surface flows into either Saltwater Creek Catchment, or into Bevian Wetland Catchment. Saltwater Creek Catchment is a narrow catchment approximately 285 hectares in size. The Bevian Wetland Catchment is a complex catchment consisting of low hills and Burrewarra Point approximately 121 hectares in size.

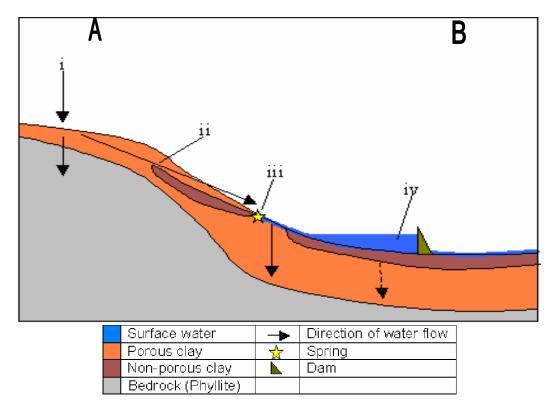
Gradients of the subject site range from steep (20°) in the upper watercourses to less than 5° within the floodplain of the Bevian Wetland. The approximate elevation ranges from less than 10m (AHD) within the Bevian Wetland to 100 m (AHD) on the ridge within the north-western section of the subject site.

## (b) Sub-Surface Water

Soils in the Rosedale-Malua Bay area consist of yellow Kurosols (Podzols), which are shallow and have good drainage. Generally underlying the top kurosol layer is a low permeable clay layer that is derived from Ordovician metamorphosed sediment parent material (i.e. shale and phyllite) which has almost no vertical drainage. The presence of the low permeable clay layers makes these soils prone to waterlogging during wet weather and where there is a low slope gradient (O'Loughlin 2000; SLCC 2000). This is demonstrated by the collection of surface runoff on the lower catchment slopes of Bevian Wetland after a storm event.

Topsoil varies in permeability and texture throughout the subject site. Ridges generally have a high permeability that decreases at low topographical points in the catchment. Soil textures follow this trend with gravelly clays and silty clays being observed in areas with high permeability and clays being observed in areas of low permeability.

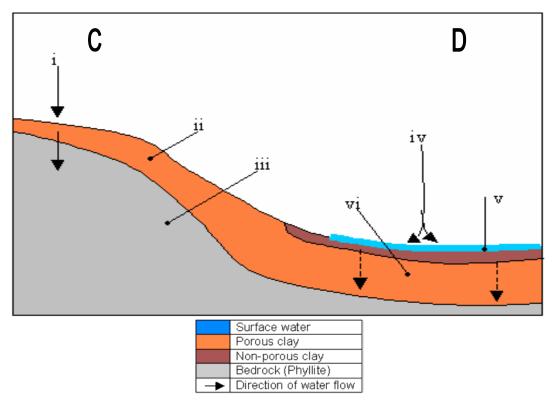
In the Saltwater Creek Catchment during a rainfall event, water infiltrates easily on ridges and flows through the soil profile either to underlying, highly weathered phyllite bedrock, or becomes subsurface lateral flow. Water flowing laterally below the soil surface may intercept the soil surface due to changes in soil texture within the soil profile, or due to a rapid change in slope. At these points a spring is formed. If the soil type is low porosity clay down hill from the spring or if the flow is rapid, the water flows overland. The flow of water cuts into underlying soils creating tributary channels which tend to be ephemeral on site. The tributary creeks form a confluence with the main channel of Salt Water Creek, adding to the volume of catchment flow (Schematic 3).



Schematic 3: Schematic diagram of surface and subsurface water flows within the Saltwater Creek Catchment. i) Rain falls on the landscape. Of the rainfall which infiltrates some flows into the underlying bedrock, and some becomes subsurface lateral flow. ii) The subsurface lateral flow, flows below the soil surface until it reaches a clay layer which pushes the flow back to the soil surface. iii) The emergence of lateral subsurface flow creates a spring which results in surface flows which combine and become channelised to create creaks iv) sections below the spring are artificially dammed to store the water for livestock. Some water infiltrates through the underlying clay, some continues to flow downstream.

In some sections of the subject site, flows from springs have been dammed to provide water for livestock. It is possible the retention of water would allow clay particles to become deposited on the dam floor and for water to slowly infiltrate through the soil profile into an underlying unconfined aquifer.

Within the Bevian Wetland Catchment, infiltration of rainfall occurs more readily on hill slopes and ridges where porous bedrock is closer to the surface, than in gullies where clays impede infiltration. Once water infiltrates the surface soil layer it flows downwards into the underlying phyllite bedrock. Water that is unable to infiltrate becomes overland flow and accumulates in a topographical low within the landscape forming the wetland. The slower velocities of water within the wetland cause entrained clay particles to become deposited within the wetlands, and water either slowly infiltrates through the deposited clay layer into an underlying groundwater system, flows out of the wetland system underneath George Bass Drive or is evaporated (Schematic 4).



**Schematic 4:** Schematic diagram of surface and subsurface water flows within the Bevian Wetland Catchment. i) Rain falls on permeable ridge soils and infiltrates into underlying, highly weathered phyllite bedrock. ii) soils become increasingly less permeable towards topographical lows. iii) underlying bedrock consists of weathered phyllite which decreases in porosity with depth. iv) water which flows overland towards the wetland, accumulates where the clay soil has a low hydraulic conductivity. v) overland flows slow in velocity and slowly infiltrate through the soil profile, depositing clay particles which have been entrained and transported from hill crests. vi) water slowly infiltrates to underlying soil layers resulting in a slow drying of the wetland if water is not replenished from surface water flows.

Bevian Wetland currently undergoes wetting-drying cycles, which follow rainfall patterns with a lag period likely to be due to slower subsurface water flows draining the landscape. The occurrence of dry periods indicates the wetland is mainly supplied by short term surface flows and ground water seepage. Groundwater was found to be between 1.4m deep in clayey alluvium, and 3.3m deep in regolith material (Douglas Partners 2002).

It is possible interactions may exist between the groundwater system of the Bevian Wetland Catchment and a larger regional coastal sands/Alluvial aquifer. Further study of interactions between subsurface flow paths of the area and underlying aquifers are required to determine whether the Bevian Wetland Catchment forms part of the recharge zone of a high yielding Coastal Sands/Alluvial Aquifer. However, given that the proposed development will not involve earthworks at depth, it is unlikely that the development will cause any significant changes of flow into subsurface aquifer.

It is assumed the present agricultural land use of the subject site, which consists of grazed pastures, would be currently undergoing unimpeded infiltration and runoff rates. This is indicated by a high level of shallow subsurface flow which is indicated by "evidence of soil terracing or soil creep" and "internal erosion of the weathered bedrock" (Douglas Partners, 2002). Soil erosion is currently low due to the "maintenance of grass cover …has prevented erosion on even the steepest hill slope" (Douglas Partners, 2002).

## 3.3.2 Proposed development impact assessment in response to specific DGRs

## 3.3.2.1 Compliance with Water Related Policies

	Address NSW Coastal Policy, Wetlands Management Policy, Estuary Management	1
6.1	Policy, NSW State Rivers and Estuary Policy.	

The following policies have been considered:

- (a) NSW Coastal Policy
- (b) Wetlands Management Policy
- (c) Estuary Management
- (d) NSW State Rivers and Estuary Policy
- (a) Compliance with the NSW Coastal Policy

The key considerations of relevance to the subject site under this policy are outlined in Section 3.2.8.1 of this report.

Within the Rosedale site two areas have been identified as key aquatic environments with conservation value; Bevian Wetland - SEPP 14 (wetland no. 194) and a number of Category 3. Outside of the site, the related Saltwater Creek ICOLL and Bateman's Bay Marine Park have been considered.

Protection of the Bevian Wetland and category 3 watercourses will be managed through the implementation of a comprehensive riparian buffer system and application of best practice stormwater management measures including gross pollutant traps, grass swales and detention basins, which will control overland flow velocities and sediment transport.

Significant watercourses will be restored through revegetation works (Schedule 1) and the lands surrounding Bevian Wetland will also provide an important restoration zone.

Open space and Conservation Precincts will be managed in perpetuity by the Community Association under a Community Management Title. Zoning of these Precincts will provide for the new E2 Conservation Zone and allow for enhanced public access. Covenants and Conservation Precincts have been developed to specifically protect remnant vegetation and ecologically important areas.

Public access will be provided to open space areas. Cultural heritage items composed of Aboriginal archaeological material and stone artefacts in the Bevian Wetland and riparian zones across the site will be preserved.

Ecological Sustainable Development (ESD) principles have been incorporated into the subdivision design and future management of the site. In all appropriate cases, conservation of biological diversity and ecological integrity has been proposed to ensure protection of the health, diversity and productivity of the environment is maintained. Where degradation has affected the ability of an ecosystem to function in a self-sufficient manner, rehabilitation and enhancement of sensitive habitats has been proposed to ensure the benefit of a healthy environment for future residents. Where data is unavailable or unreliable a conservative approach has been adopted.

Moderate-high density housing is located in the lower portion of the site towards the coast, and is separated from the lower density housing by ecological corridors, which incorporate rural values held by the community and maintains open vistas of native forests.

Conservation of threatened species within the designated Conservation Precincts will be enhanced through improved corridors within the subject site to vegetation offsite. Continual monitoring and regular reporting of wildlife diversity will be carried out to assess, manage and modify the rehabilitation program. Standards in surveying and assessment of wildlife biodiversity will be established prior to the commencement of monitoring.

The reduction, re-use and recycling of stormwater is encouraged through the inclusion of rainwater tanks with each house. Water quality of urban runoff will comply with guidelines that have been established based on the Australian and New Zealand Guidelines for Fresh and Marine Water Quality and follow the Australian Guidelines for Water Quality Monitoring and Reporting. Best management practices proposed to minimise pollution are based on Ecologically Sustainable Development (ESD) principles.

Continual monitoring and regular reporting of water quality will be carried out to assess, manage and modify impacts caused by land use change. As a part of the reporting process it is recommended that a section of the report is devoted to interpretation of water quality results and recommending actions necessary to maintain an ecologically acceptable standard of water quality.

## (b) Compliance with the Wetland Management Policy

The key considerations of relevance to the subject site under this policy are outlined in Section 3.2.8.2 of this report.

Bevian Wetland presently experiences wet and dry cycles in response to rainfall events. Principle 1 of the Wetlands Management Policy acknowledges the dependence of lacustrine flora and fauna on the wet and dry cycles within wetlands. In recognition that changes to hydrological patterns within a wetland are likely to result in degradation and to address the requirement of the Wetlands Management Policy to return the water regime of wetlands to the natural regime, it is recommended native plant species are used to revegetate wetland and riparian zones. Plant species composition and planting densities will reflect local remnant forest areas.

Bevian Wetland will be protected and regenerated to allow for near-natural aquatic processes to occur. Part of the rehabilitation process will include selective removal of non-native and non-local pest flora and fauna species. Vegetated buffer zones will also surround watercourses, forming a practical and aesthetically pleasing component of the development. Best practice stormwater management practices will be implemented across the site including, retention basins, gross pollutant traps and the revegetation of riparian zones to ensure water flows are maintained and that water quality is maintained or improved.

## (c) Estuary Management Policy

The key considerations of relevance to the subject site under this policy are outlined in Section 3.2.8.3 of this report.

The Estuary Management Program was established in 1992 to restore and protect estuaries along the NSW coast. The Program targets a broad range of issues and engages local communities in the process of preparing Estuary Management Plans.

The program focuses on improving or maintaining the overall health and functionality of an estuary, and maintaining the integrity of the whole system including its chemical, physical, and biological properties, as well as its economic, recreational, and aesthetic values.

The following list summarises what is considered to be the most adverse impacts potentially affecting the Rosedale estuarine environment.

- Declining water quality
- Sediments and nutrients
- Removal of habitat

Increases in sediment lands and eutrophication associated with sedimentation of waterways pose a likely risk. This risk is notably higher during the construction period when soil surfaces are cleared and left unprotected against erosional processes. Removal of sediment once it has arrived within a water body requires removal which is likely to disturb and resuspend sediment particles in the water column.

To prevent degradation of the aquatic ecological communities within the Rosedale site and those linked externally to the Rosedale site (Saltwater Creek ICOLL and Bateman's Bay Marine Park) water sensitive urban design principles have been applied across the site and include, detention basins, grass swales, water tanks at each dwelling, revegetation of riparian zones and gross pollutant traps. In particular Bevian Swamp & Saltwater Creek tributaries are protected by a comprehensive network of buffers and sediment control measures during construction.

## (d) NSW State Rivers and Estuary Policy

The key considerations relevant under this policy are outlined in Section 3.2.8.4 of this report. The proposed development at Rosedale provides comprehensive protection of riparian and estuarine ecosystems associated with the site. Remnant areas of native forest and wetland communities will be retained and incorporated into buffers that are integral to offsetting measures of the proposed development.

Existing vegetation to be retained will be regenerated. Improvements in biodiversity through revegetation, and prevention of future degradation through sound management of urban runoff will be used to improve the quality of riparian and estuarine ecosystems.

#### DGR 6.1 Conclusion

The Bevian Road Concept Application is considered to be consistent with each of the water related policies outlined above.

## 3.3.2.2 Water quality and quantity management

DGR 6.2 Address potential impacts on the water quality of surface and groundwater, on all water courses and on ground water dependent ecosystems. Consideration must also be given to the protection of the Bateman's Bay Marine Park.

## Surface water

Surface water flows within ephemeral grass channels show signs of stream bank erosion and riparian vegetation clearing. Some sections of channel have also been dammed to provide drinking water to livestock. It is likely the trampling effects of livestock and the reduced stability of the creek channels associated with vegetation clearing have contributed to channel bank erosion.

Changes in land use from pastoral agricultural to rural urban are likely to result in slight changes to landscape hydrology. The introduction of increased surface areas covered by impermeable materials such as concrete, tar and buildings are likely to result in very high runoff from these areas. The use of riparian buffer zones and open space/conservation areas are incorporated into the development as well as a sophisticated stormwater treatment train to maintain the current water flows and water quality within and leaving the subject site.

All watercourses will be revegetated within the core riparian zone with native plant species. Revegetation works will commence prior to development of the area to provide a safeguard to water quality within Saltwater Creek and the Bevian Wetland.

Increasing riparian vegetation is likely to increase water extraction from surface and subsurface water sources (Benyon *et al* 2006). However, the presence of canopy trees which shade the river channel and intermediate shrubs and grasses which intercept and slow overland flows are likely to result in an overall improvement in water quality in terms of physicochemical, hydro chemical and aesthetic characteristics.

## Sub-Surface Water

To maintain the quality of groundwater it is recommended surface and groundwater quality monitoring and reporting is established prior to commencement of the proposed development.

## **Groundwater Dependent Ecosystems**

"Groundwater-dependent ecosystems (GDEs) are ecosystems that must have access to groundwater to maintain their ecological structure and function" (Murray et al., 2006)

The protection of groundwater dependent ecosystems is now recognised as an important part of water management. However, the growing understanding of the processes that underlay GDE needs to be reflected in continuously updated management plans, which take new information into account (MacKay 2006).

Rivers are generally classified as a GDE due to the contribution of base flow to stream flow. Rivers depend upon groundwater to varying degrees, and may change over time in response to anthropocentric effects on the groundwater system. These effects include groundwater extraction from riparian wells, or variations in local water table depth (Boulton & Hancock 2006). Water extraction and alteration to groundwater systems often results in degradation of GDE's (Murray *et al* 2006), which include a reduction in available food and habitat for native wildlife and reduced water quality (Murray *et al* 2006).

With the exception of ephemeral streams that flow only after rain and surface runoff, rivers are groundwater dependent. GDE's include the ecology within the riparian zone, where the lifecycles of wildlife have adapted to become dependent on the groundwater system (Boulton & Hancock 2006).

Based on the literature relating to GDE's, Saltwater Creek is considered to be a Groundwater Dependent Ecosystem.

The effects of replanting woody riparian vegetation, such as tall canopy trees, as a part of riparian vegetation renewal, is likely to result in increased annual water consumption compared to the present grassy vegetation cover. The increased presence of woody vegetation is likely to reduce stream and groundwater recharge, when compared to present grassy vegetation (Benyon *et al* 2006).

Increases in water infiltration as a result of disposal of stormwater through infiltration and percolation as a part of water sensitive urban design, are likely to offset groundwater uptake by woody vegetation. It is also likely the restoration of native riparian vegetation will return groundwater consumption by GDE's to a similar level to the pre-settlement consumption levels.

The Swamp Oak Floodplain Forest (SOFF) and River Flat Eucalypt Forest surrounding the Bevian Wetland are highly likely to be groundwater dependent ecosystems given their association with areas of land frequently or periodically waterlogged or inundated (NSW Scientific Committee 2004). Variations in groundwater depth or quality are likely to affect the vegetation structure of these endangered ecological communities. Other threats to these vegetation communities include selective clearing for development, potential pollution, waste and sedimentation in urban runoff (NSW Scientific Committee 2004). Since pumping of groundwater from the wetland area is not proposed and a 50 plus metre protective buffer is to be created, it is considered that changes within the landscape will not be significant to directly affect the groundwater dependent ecosystems on site.

## Bateman's Bay Marine Park

The Bateman's Bay marine park encompasses the majority of the Eurobodalla Shire coastal zone. From north of Bateman's Bay to Rosedale Beach, the marine park is zoned *Habitat Protection* and from Jimmies Island at the southern end of Rosedale Beach to Burrewarra Point it is zoned as a *Sanctuary Zone*.

The maintenance or improvement of water quality within the subject site through the stormwater treatment train will ensure that the water quality further down stream from sources leaving the subject site will also be maintained or improved. This is the case for both surface and groundwater sources, which eventually make their way to the Pacific Ocean off Rosedale and Barlings Beaches.

#### • SEPP 71 – Coastal Protection

The key considerations of this policy are outlined in Section 3.2.7.1 of this report. Commentary on those considerations relevant to the ecological features (denoted in Section 3.2.7.1 by an asterix "\*") of the site are provided below.

## Subject site remediation

Three key restoration zones have been designated within the site (Schedule 1). These include Ecological Corridor 1, Ecological Corridor 2 and the Southern Conservation Zone. The two corridors will provide (once restored) vegetation connectivity between remnants within the site and vegetation off site. These corridors will improve the movement of fauna and genetic transfer of plant materials across the site and improve the viability of protected remnants within the site.

As the ecological corridors and southern conservation zone provide buffers between the development and aquatic habitats. In addition the asset protection zones, which are made up with roads, and landscaped areas, provide further surface runoff filtration. The modelled results from the MUSIC quantity and quality model identify that the proposed stormwater treatment train will result in an improvement in water quality from pre to post development.

## Conservation of water quality and use

The Bevian Road Concept Application aims to achieve a maintain or improve outcome for water quality post development. Modelling of the water treatment measures to be applied across the site has resulted in an improvement to existing conditions in water quality (*Patterson Britton* 2007b).

## Conservation of fish and marine vegetation and their habitats

There are no marine habitats within the site and fresh water fish habitats are considered to be limited to the Bevian Wetland and small dams found onsite. Fish habitat has been considered in the ephemeral watercourses within the northern portion of the site which link with the Saltwater Creek ICOLL and eventually the South Pacific Ocean. These habitats will be retained onsite and associated riparian vegetation restored. The proposal will result in an overall improvement in fish habitat on site.

## Conservation of animals, plants and their habitats

The conservation of flora and fauna and their habitats has been a key focus of the Concept Application. The Bevian Road Concept Application provides integrates development within a series of conservation areas. In particular good quality habitat has been fully conserved, low condition habitat for Threatened species and endangered ecological communities, has been restored at a 1:1 ratio and total vegetation cover has increased significantly across the site once restored.

Conservation precincts retain and protect remnant native vegetation within the site, whilst the proposed restoration of riparian zones will improve the vegetation connectivity between these protected remnants and to vegetation off site. As a consequence, fauna habitat, movement and the genetic transfer of plant material across the site will be enhanced.

#### DGR 6.2 Conclusion

The Bevian Road Concept Application will improve the existing water quality within and leaving the site through the implementation of water sensitive urban design principles. Protection water quality and quantity management measures will serve to protect the important water bodies within the site, such as Bevian, whilst also protecting the important aquatic habitats offsite such as Saltwater Creek ICOLL and Bateman's Bay Marine Park. It is considered that the Bevian Road Concept Application adequately meets the key requirements of the SEPP 71 – Coastal Protection Policy.

#### 3.4 HAZARD MANAGEMENT AND MITIGATION

#### 3.4.1 Description of existing sediment management and erosion conditions

## <u>Current sediment management and erosion conditions</u>

#### (a) Watercourses and dams

Watercourses within the site are currently largely eroded from a history of geomorphologic processes, vegetation clearing and livestock grazing. During construction, the potential for sediment transportation into streams during rainfall events and bank erosion is significant.

#### (b) Unsealed roads

Bevian Road is the main access point from George Bass Drive along the southern boundary of the site, through the site and from the site in the north eastern corner. This road is currently unsealed and provides a potential source for sediment transportation into water ways during rainfall events. During high rainfall events runoff from the southern catchment collects and inundates the current Bevian Road which is highly rutted from passing vehicles.

## 3.4.2 Proposed development impact assessment in response to specific DGRs

## 3.4.2.1 Management of sediment and erosion

DGR	Demonstrate the use of best management sediment and erosion techniques particularly
8.4	to the area immediately surrounding the SEPP 14 Bevian Wetland.

### (a) Bevian Wetland

An existing unsealed road currently adjoins the western boundary of Bevian Wetland and provides the main southern access to the site. It is proposed to upgrade and seal this road as the main access point to the site. The current alignment of the road will be retained in order to minimise earthworks and the potential to adversely impact on Bevian Wetland.

The boundary of Bevian Wetland along this road has been independently surveyed and mapped, to ensure the road alignment is not within the wetland. The sealing of this road will reduce the impact of erosion and sediment transportation into the wetland during rainfall events. The road will be raised by approximately 1 m to raise the road above the potential flood level of Bevian Wetland and Stormwater runoff from the road will be controlled by stormwater filtration devices installed below the road pavement at strategic locations.

Two detention basins are proposed to the north of Bevian Wetland, within the Bevian Wetland catchment, which will assist in trapping and filtering any sediments before they enter the wetland. A host of sediment and erosion control methods will be used during construction works, the most sensitive area being the main access road crossing immediately to the north of Bevian Wetland and construction of road crossings across watercourses onsite.

## (b) Watercourses

Watercourses within the site will be restored through riparian revegetation and regeneration works (Schedule 1 – Restoration Plan). Indeed this task has already commenced onsite where sensitive zones have been fenced and stock excluded to allow natural regeneration. This will improve bank stability, ease water flow velocities and assist in averting the transportation of sediments into water ways during rainfall events.

## (c) Roads

Roads have been designed to work with the natural contours as closely as practicable to minimise erosion associated with earthworks. Erosion management is detailed further in the Ecological Site Management Plan (ESMP) (Conacher Travers 2007b), which is a working document prepared to ensure the correct implementation of land management techniques across the site prior, during and post construction.

The ESMP forms to main compliance documentation to which the proponent or agent of will be required to comply. A detailed Sediment and Erosion Control Plan is required to be prepared and approved by the Project Ecologist. A compliance certificate is to be issued by the Project Ecologist to ensure all sensitive areas are protected with appropriate sediment and erosion control measures. In some cases the sediment and erosion control measures will be "doubled up" to quard against failure during construction or high rainfall events.

## (d) Exposed soils during construction

The ESMP (*Conacher Travers* 2007b) outlines the process for management of erosion and sediments prior, during and post construction phases. Aspects such as silt fencing, rapid vegetation of exposed soils and protective fencing are discussed in order to prevent sediments from reaching water ways.

The ESMP forms to main compliance documentation to which the proponent or agent of will be required to comply. A detailed Sediment and Erosion Control Plan is required to be prepared and approved by the Project Ecologist. A compliance certificate is to be issued by the Project Ecologist to ensure all sensitive areas are protected with appropriate sediment and erosion control measures. In some cases the sediment and erosion control measures will be "doubled up" to guard against failure during construction or high rainfall events.

## DGR 8.4 Conclusion

The Bevian Road Concept Application adequately addresses the management of erosion and sediments across the site prior, during and post construction through the application of the following management measures:

- Silt fencing including "double protection" at key drainage points.
- Rapid Protection and stabilisation of exposed soils
- Mulching and revegetation of exposed soils
- Gross Pollutant Traps (GPTs)
- Grass swales within road reserves
- Detention basins
- Revegetation of watercourses
- Alignment of roads with natural contours of the landscape
- Retention of the existing Bevian Road alignment and proposed stormwater treatment measures.

As such it is considered that the application effectively demonstrates the use of best practice sediment and erosion techniques across the site.

## **SECTION 4 - CONCLUSIONS**

The proposed Bevian Road subdivision has been designed in response to the environmental constraints identified within the site. As a result, areas of conservation and open space have been integrated with the development. Through this integrated design process existing ecological features of the site have been protected and significantly enhanced. The protection of ecological features has further assisted in improving the overall visual amenity of the site.

Overall the Concept Approval Plans are considered to adequately conserve and enhance the ecological features within the site such that the future development will result in an improvement in the ecological functioning of the landscape.

The future development of the site is guided by the **Conservation and Land Use Management Plan** (CLUMP - Conacher Travers 2007c) which provides principles for use of the land and establishment of ecological precincts as E2 Conservation Zones. Any future development applications on this site will be required to be consistent with the aims and objectives of the CLUMP.

The management of the site will be controlled by the **Ecological Site Management Plan** (ESMP - Conacher Travers 2007b) that sets up a framework for integrating construction and subdivision works with critical tasks that protect and rehabilitate habitat on site.

Key ecological protection and enhancement measures within the site include:

- The retention and fencing of existing native vegetation remnants and hence protection of habitat
- Buffering of Bevian wetland and restoration of associated vegetation
- Revegetation and regeneration of significant watercourses to provide bank stability, create vegetation connectivity and improve habitat
- Upgrading currently eroding gravel pavement on Bevian Road to a sealed surface and lifting the road out of known watercourses.
- Bio-retention swales along roads to treat and slow down runoff from lots and roads and promoting infiltration
- Bio-retention rain gardens on selected lots to infiltrate, treat and slow down runoff from paved areas on the lots
- Gross pollutant traps to remove sediment, debris, organic matter and litter
- Upgrade farm dams to improve runoff quality and provide more diverse aquatic habitat
- · Retention basins to collect sediments and control runoff flows
- Storage and infiltration promotion within bio-retention systems to balance surface and subsurface flows and slow down flows to maintain existing conditions
- Creation of vegetation corridors to improve vegetation connectivity between native remnants and vegetation offsite
- Maintain water flows and maintain or improve water quality within the site to protect downstream water bodies including Saltwater Creek ICOLL and Bateman's Bay Marine Park.

As demonstrated by the Maintain or Improve Test in the Flora and Fauna Assessment (Conacher Travers 2007)), the development footprint allows for a significant improvement in ecological functioning by protecting ecologically sensitive features of the site and enriching habitat within the ecological corridors. Restoration works adjacent to Bevian Wetland and within the ecological corridors results in a net positive ecological outcome overall.

## 4.1 OUTCOME OF DGR ASSESSMENTS

In accordance with the Director General Requirements, the following outcomes have been achieved.

#### **DGR 4.1**

A maintained or improved result has been achieved for threatened flora, endangered ecological communities and a number of threatened fauna species known to occur or with the potential to occur within the site (Section 5).

The implementation of the following mitigation measures will result in the protection of threatened flora and fauna species and endangered ecological communities known to occur or with the potential to occur within the site:

- Exclusion of existing cattle grazing;
- Weed control;
- Erosion control;
- Installation of protective fencing and signage;
- Stormwater Quality and Quantity Control (Bio-retention basins, bio-swales, gross pollutant traps, rainwater tanks and revegetation of watercourses);
- Retention of Dead Timber and Habitat Supplementation;
- Prohibition of domestic animals with the exception of companion animals as defined under the Companion Animals Act 1998;
- Retention of Regrowth;
- Creation of vegetation corridors;
- Retention or replacement of all hollow bearing trees; and
- Strategic Supplementary Planting

As such, the Bevian Road Concept Application adequately meets the requirements of the *Draft Guidelines for Threatened Species Assessment* (DEC & DPI July 2005) and the provisions of the *Threatened Species Conservation Act* 1995.

#### **DGR4.2**

The creation of Ecological Corridor 1 and Ecological Corridor 2 will link the existing native remnants to vegetation offsite. The improved vegetation connectivity across the site will assist fauna movement and improve water quality within and downstream from the site. Landscaping with locally occurring native species within open space areas and streets will also serve as stepping stones to the ecological corridors. As such the Concept Application meets the requirements of *DGR 4.2*.

## **DGR4.3**

The incorporation of conservation areas into E2 Environmental Conservation Zones will ensure long term protection of ecologically sensitive features and as such meets the requirements of *DGR 4.3*.

#### **DGR 5.1**

The provision of buffers to watercourses (ecological corridors 1 & 2), revegetation of the riparian vegetation, restoration of vegetation surrounding the Bevian Wetland and the implementation of water sensitive urban design principles across the site; the Bevian Road Concept Application will achieve an improvement in habitat and water quality within and downstream from the site and as such meets the requirements of *DGR 5.1*.

#### DGR 5.2

Bevian Wetland will primarily be protected by a 50 metre buffer plus asset protection zones to the wetland. Extensive restoration surrounding the wetland for the rehabilitation of associated endangered ecological communities, installation of two primary dry detention basins to the north of the wetland and the implementation of water sensitive urban design across the site maintains and improves stability, water quality, habitat and natural functioning of Bevian Wetland. As such the Concept Application meets the requirements of *DGR 5.2*.

#### **DGR 5 3**

Department of Natural Resources (now Department of Environment and Climate Change) buffer requirements for water course, were agreed to during a site visit by the DECC Representative Bob Britten on the 22 November 2006. All buffers have been designed to provide appropriate bank stability and water quality protection for Category 3 watercourses. Revegetation of watercourses will also improve vegetation connectivity and habitat across the site. As such the Concept Application meets the requirements of *DGR 5.3*.

#### DGR 6.1 & 6.2

Four water related policies - NSW Coastal Policy, Wetlands Management Policy, Estuary Management Policy and NSW State Rivers and Estuary Policy – have been addressed within this report. The protection of water courses and receiving water bodies on site and downstream of the site has been fundamental to the subdivision plan. The implementation of water sensitive urban design principles has enabled the protection of surface and subsurface flows to these aquatic areas and as such the Concept Application meets the requirements of DGR 6.1 and DGR 6.2.

#### **DGR 8.4**

The management of erosion and sediment transportation across the site prior, during and post construction has been addressed through the application of the following management measures:

- Silt fencing reinforced with hay bales including double protection where necessary.
- Stabilisation of exposed soils
- Gross Pollutant Traps (GPTs)
- Grass swales within road reserves
- Dry detention basins
- Revegetation of watercourses

The application and monitoring of these measures will be controlled in accordance with the Ecological Site Management Plan (Conacher Travers 2007b). A statement of commitments and the Community Management Statement including the preparation of a detained Sediment and Erosion Control Plan will be integrated with the Ecological Site Management Plan to ensure that all critical outcomes are achieved on site. As such it is considered that the Concept Application effectively demonstrates the use of best practice sediment and erosion control techniques across the site and meets the requirements of *DGR* 8.4.

## 4.2 COMPLIANCE WITH STATUTORY REQUIREMENTS

## Eurobodalla Shire Council Local Government Policy

• Yellow bellied Glider Policy (specific to Broulee area)

This Eurobodalla Shire Council local government policy does not strictly apply to the subject site however, given the proximity (<5km) of the site to the Broulee area and the record of a Yellow bellied Glider within the site, the policy objectives are considered relevant to ensure the long term protection of this Yellow bellied Glider habitat within the site.

This policy is specifically addressed in Section 4.1.2.1 - Threatened Species Conservation of this report.

# <u>Environmental Planning & Assessment Act 1979 – Part 3A Environmental Assessment Requirements</u>

The *EP&A Act 1979* requires the assessment of threatened species as per the DRAFT Guidelines for Threatened Species Assessment (DEC & DPI 2005). This has been undertaken within Section 5 of the Flora and Fauna Assessment (*Conacher Travers 2007a*) and a summary is provided in Section 4.1.2.1 of this report. The results of the assessment are as follows:

## **Endangered Ecological Communities**

The application of the maintain and improve assessment for Swamp Oak Floodplain Forest (SOFF), Riverflat Eucalypt Forest on Coastal Floodplains (RFEFCF) and Freshwater Wetlands on Coastal Floodplains (FWCF), Tables 3-5 respectively, resulted in a maintained or improved outcome for all endangered ecological communities identified within the site.

Specifically, an improvement in both the condition and overall extent will be achieved through the restoration and revegetation of endangered ecological communities SOFF and RFEFCF.

The total extent of SOFF will increase from 11.23ha to 14.46ha, whilst the total area of good condition vegetation will improve from 4.57ha to 12.41ha.

The total extent of RFEFCF will increase from 2.05ha to 2.43ha, whilst the total area of good condition vegetation will improve from 0ha to 1.61ha.

The total extent and condition of FWCF will be maintained at 5.94ha.

All endangered ecological communities recorded on site will be protected from indirect impacts such as stormwater runoff through the implementation of bio-swales along road sides, bio-retention basins, gross pollutant traps and the revegetation of watercourses.

As such it is considered that the Bevian Road Concept Application will result in a net improvement in the extent and condition of Swamp Oak Floodplain Forest and Riverflat Eucalypt Forest on Coastal Floodplains and will maintain the extent and condition of the existing Freshwater Wetlands on Coastal Floodplains of endangered ecological communities recorded within the subject site.

## Threatened Flora

The maintain and improve test for *Aldrovanda vesiculosa* and *Correa baeuerlenii*, Tables 7 & 8 respectively, resulted in a maintain or improved outcome for all threatened flora species with the potential to occur within the site.

Specifically, a significant improvement in overall extent of suitable habitat for *Correa baeuerlenii* will be achieved from the existing 18.68ha to 42.8ha. This is a result of the revegetation works across the site, which will create ecological corridors through the replanting of Spotted Gum/Ironbark Forest and Blackbutt Woodland.

The total extent of suitable habitat for *Aldrovanda vesiculosa* will be maintained within the Bevian Wetland.

As such, the Bevian Road Concept Application will result in maintained or improved suitable habitat for threatened flora species with the potential to occur within the subject site.

### Threatened Fauna

The application of the maintain and improve assessment for threatened fauna, Tables 10-29, resulted in a maintained or improved outcome for all threatened fauna species known to occur or with the potential to occur within the site.

Habitat types used for the assessment were based on natural vegetation communities listed in Table 2 of this report, with the exception of the Grassland with Scattered Trees vegetation community.

The Grassland with Scattered Trees vegetation community, which covers approximately 78% (146.68 ha) of the site (Figure 6), has been excluded from the assessment based on its disturbed nature. 142.62 ha of this community will be removed as a result of the proposed development. This habitat is not considered to be significant to the lifecycle of any threatened fauna species for the following reasons:

- Grassland with Scattered Trees habitat is considered to be of low quality due to past agricultural associated clearing and current grazing by cattle.
- The Grassland with Scattered Trees habitat is considered to provide a limited foraging resource only and as such provides marginal habitat.
- The majority of the threatened fauna likely to utilise the Grassland with Scattered
  Trees habitat are considered to be highly mobile and would be unlikely to utilise the
  subject site exclusively. Surrounding farmlands to the north and west of the site
  provide similar cleared lands with scattered trees suitable for foraging.
- Any hollow bearing trees identified within the Grassland with Scattered Trees habitat will be retained within the post development landscape or replaced at a ratio of 2:1 in conservation zones (Figure 7) within the subject site.
- Areas of cleared foraging land will be retained across the site in the form of open space/recreation areas and larger lots
- Compensatory habitat will be provided for within the site including the restoration of Ecological Corridors 1 & 2 (Schedule 1 - Restoration Management Plan of the ESMP), which will create new vegetation linkages between remnants within and offsite and the retention and restoration of the Southern Conservation Zone (Schedule 1 - Restoration Management Plan of the ESMP).
- Of the twenty (20) threatened fauna species considered to have a loss in suitable habitat within the site, four (4) have been recorded within the site (Table 29). These four species are: Powerful Owl, Eastern Freetail Bat, Greater Broad-nosed Bat and Eastern Bentwing Bat. These species are considered to be highly mobile and are unlikely to utilise the subject site exclusively. Habitat to the north and west of the site are likely to provide a similar foraging resource for these species.

The overall existing suitable habitat for threatened fauna within the subject site, excluding the Grassland with Scattered Trees vegetation community, is 40.94ha. As a result of the retention, restoration and revegetation works proposed within the site the net suitable habitat will be improved to 74.9ha.

As such, the Bevian Road Concept Application will result in a net improvement in suitable habitat and vegetation connectivity for all threatened fauna species known to occur and with the potential to occur within the subject site and any losses in Grassland with Scattered Trees habitat are considered to be insignificant.

## Threatened Species Conservation Act (1995)

The specific requirements of the *Threatened Species Conservation (TSC) Act* (1995) must be addressed in the assessment of flora and fauna matters. This requires the consideration of potential impacts on threatened species, populations and ecological communities. An assessment has been undertaken within Section 5 of the Flora and Fauna Assessment report (*Conacher Travers 2007a*) and a summary provided in Section 4.1.2.1 of this report.

The result of the assessment was that there is unlikely to be any significant impacts from the proposed development on threatened species or endangered ecological communities.

## Fisheries Management Act (1994)

No threatened fauna species listed under this Act have been recorded within the subject site or are considered to have the potential to occur within the site. The Concept Application will improve aquatic habitat within the site through the revegetation of watercourses and the provision of appropriate fish passage along watercourses in the northern portion of the site, which connects with Saltwater Creek ICOLL before reaching the South Pacific Ocean at Rosedale Beach.

## Rivers & Foreshores Improvement Act (1984)

The Bevian Road Concept Application will protect all nominated water courses recognised under this Act by providing riparian buffer setbacks consistent with Category 3 Watercourses. In difference to DGR 5.3, it has been concluded that due to the high level of erosion found within each watercourse, there is no defined 'top of bank'. In consultation with DECC (Bob Britten formerly DNR), Bob Britten has agreed to a riparian buffer concept that protects a 1:2 year flow event, protects the erosion banks and provides a total width that reflects at a minimum reflects a category 3 watercourse. In addition, water sensitive urban design principles have been applied across the site and as such the Concept Application has met the requirements of this Act to protect the nominated watercourses.

This Act is specifically addressed in Section 4.2.2.1- Riparian Zone Buffers of this report.

## Native Vegetation Management Act (2003)

Under the *Native Vegetation (NV)* Act (2003) and Regulations gazetted in December 2006, native vegetation protected under the Act, likely to be impacted by a development, may require a referral to the relevant CMA. However, given that the Rosedale development application is being considered under Part 3A of the *EP&A* Act (1979), the following exemption applies:

Section 75U of the EP&A Act (1979) states that approval under section 12 of the NV Act (2003) is not required for clearing of native vegetation.

The Minister may still choose to refer the development proposal application to the relevant CMA (in this case Southern Rivers CMA).

Liaisons with Donna Hazel, Native Vegetation Coordinator, of the Southern Rivers CMA on the 19 April 2007, advised that if the project is referred to the CMA, a simulated assessment may be undertaken for the site to determine whether or not a maintain or improve outcome could be achieved.

Three of the four zonings within the site are potentially caught by the *NV Act* (2003). These are: Zone 1c - Rural Small Holdings (6.84ha), Zone 1a - Environmental Constraints (15.58ha) and Zone 7a - Environment Protection - wetlands (8.31ha). Subsequent advice from the Department of Planning originating from the CMA, has identified that land zoned 10 - Urban Expansion (159.11ha) is also covered under the NV Act (2003).

The Threatened Species Assessment Guidelines for 3A applications require the completion of a maintain or improve test which is based on the Biometric Assessment Guidelines in particular the method of determining the condition of Endangered Ecologically Communities. This assessment identified that that there is unlikely to be any significant impacts from the proposed development on threatened species or endangered ecological communities

A maintained or improved result has been achieved for threatened flora, endangered ecological communities and a number of threatened fauna species known to occur or with the potential to occur within the site (Section 5).

In order to ensure that a positive outcome is achieved overall for on site a net positive outcome of an additional 13.5 hectares of native vegetation (Largely Spotted Gum Forest) will be regenerated onsite. There will also be a net increase in high quality habitat for Endangered Ecological communities ensuring a maintain outcome.

## SEPP 71 – Coastal Protection

The Concept Application meets the requirements of SEPP 71 through the retention, protection, enhancement of vegetation and implementation of water sensitive urban design within the site. As a result water quality within and downstream of the site will be improved and native flora and fauna habitats will be enhanced.

This policy is specifically addressed in Section 4.3.2.2 – Water quality and quantity management of this report.

#### SEPP 44 – Koala Habitat Protection

Given the absence of Potential or Core Koala habitat within the subject site and a maintain or improve outcome for flora and fauna habitats in Section 5 of the Flora and Fauna Assessment Report (Conacher Travers 2007a), the subject site is not considered to contain significant Koala habitat. The Concept Application is unlikely to have an impact on Koala populations or its habitat. Further to this, the proposed development will improve the potential habitat for this species through the creation of wildlife corridors between remnants within the site and vegetation off site. Planting of foraging species will also enrich the potential habitat on site.

This policy is specifically addressed in Section 4.1.2.1- Threatened species conservation of this report. The Policy is also addressed within Section 4.11.1 of the Flora and Fauna Assessment (Conacher Travers 2007a).

## SEPP 14 – Coastal Wetlands

Key ecological aspects of this policy considered within this report include: the growth of native plant communities, the survival of native wildlife populations, the provision of quality of habitat for both indigenous and migratory species, the surface and groundwater characteristics of the site on which the development is proposed to be carried out and of the surrounding area, including salinity and water quality. The Concept Application is considered to meet each of these objectives through the protection and enhancement of native vegetation surrounding Bevian Wetland, restoration of watercourses, overall improvement in

vegetation connectivity across the site and the treatment of stormwater runoff to a high standard. As a result of the identified mitigative measures, the current quality of habitat within Bevian Wetland will be maintained and surrounding habitat significantly expanded.

This policy is specifically addressed in Section 4.2.2.1- Riparian Zone Buffers, (c) Bevian Wetland, of this report.

# NSW Coastal Policy, Wetlands Management Policy, Estuary Management Policy and NSW State Rivers and Estuary Policy

The protection of water courses and receiving water bodies on site and downstream of the site has been fundamental to the subdivision plan. The implementation of water sensitive urban design measures will enable the protection of surface and subsurface flows moving into water ways and water bodies' onsite and offsite to the Saltwater Creek ICOLL and Bateman's Bay Marine Park. As such the Concept Application meets the requirements of these policies.

These policies are specifically addressed in Section 4.3.2.1 - Water related policies, of this report.

## Environment Protection and Biodiversity Conservation Act (1999)

No threatened fauna or flora listed under this Act has been recorded within the site, however, the Concept Application will retain, protect and enhance native vegetation and habitat within the site such that any threatened species with the potential to occur within the site will not be impacted by the proposed development.

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## **FIGURES**

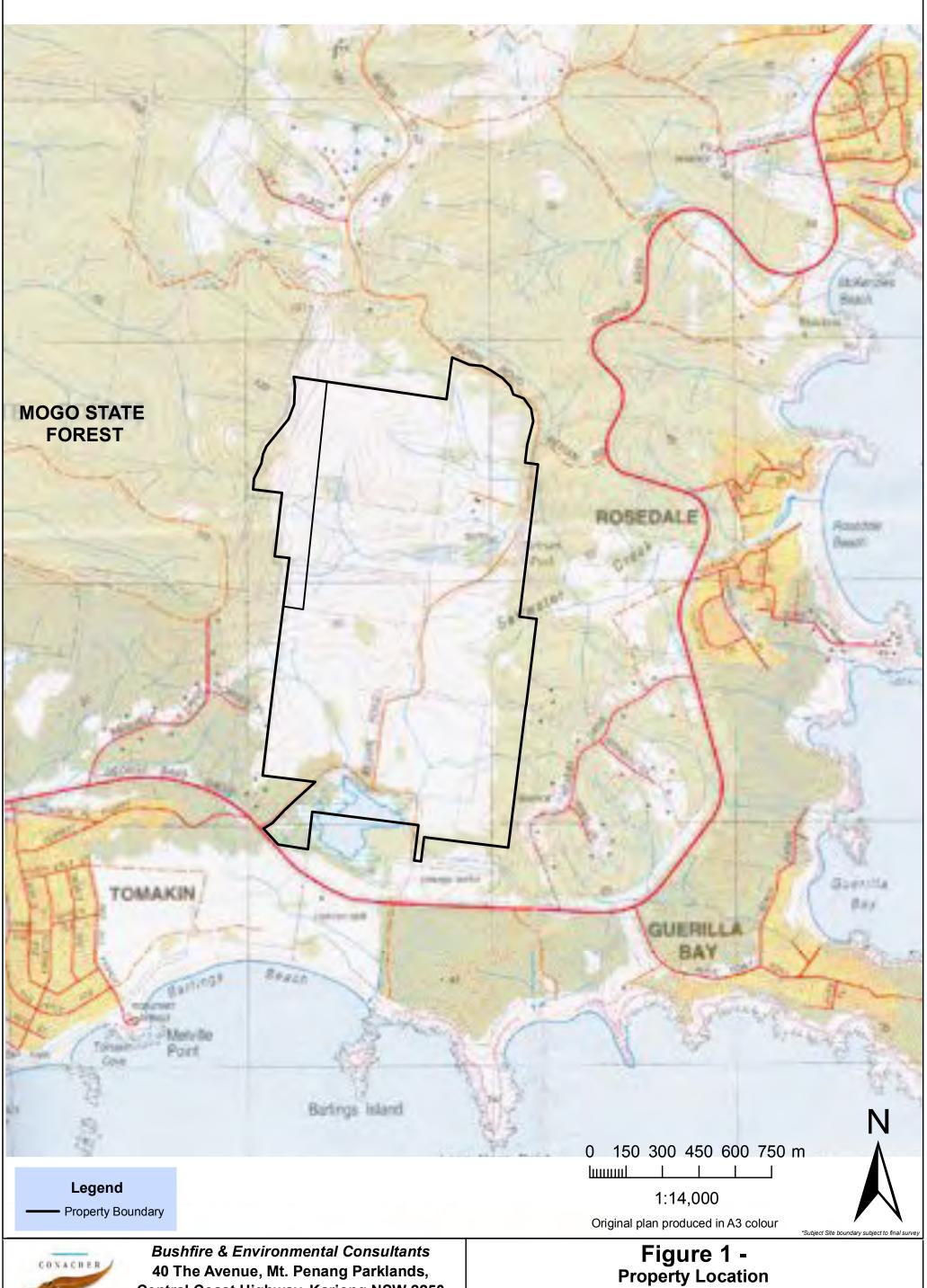
FIGURE 1	Property Location
FIGURE 2	Aerial appraisal
FIGURE 3	Constraints Map
FIGURE 4	Subdivision Plan
FIGURE 5	Precinct Plan
FIGURE 6	Vegetation Communi

FIGURE 6 Vegetation Communities FIGURE 7 Flora and Fauna Survey

FIGURE 8 Buffer Analysis

FIGURE 8.1 Buffer Analysis (Riparian Zoom)
FIGURE 8.2 Buffer Analysis (Riparian Zoom)
FIGURE 8.3 Buffer Analysis (Riparian Zoom)
FIGURE 8.4 Buffer Analysis – Bevian Wetalnd
FIGURE 8.5 Buffer Analysis – Cross Sections

FIGURE 9 Catchment Map





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Bevian Road, Rosedale

Ver.F1 By.TM 17/10/07 Ref.No.6052

Source: Dept. of Lands 1:25,000 Aerial Photograph,





Original plan produced in A3 colour



\*Subject Site boundary subject to final survey

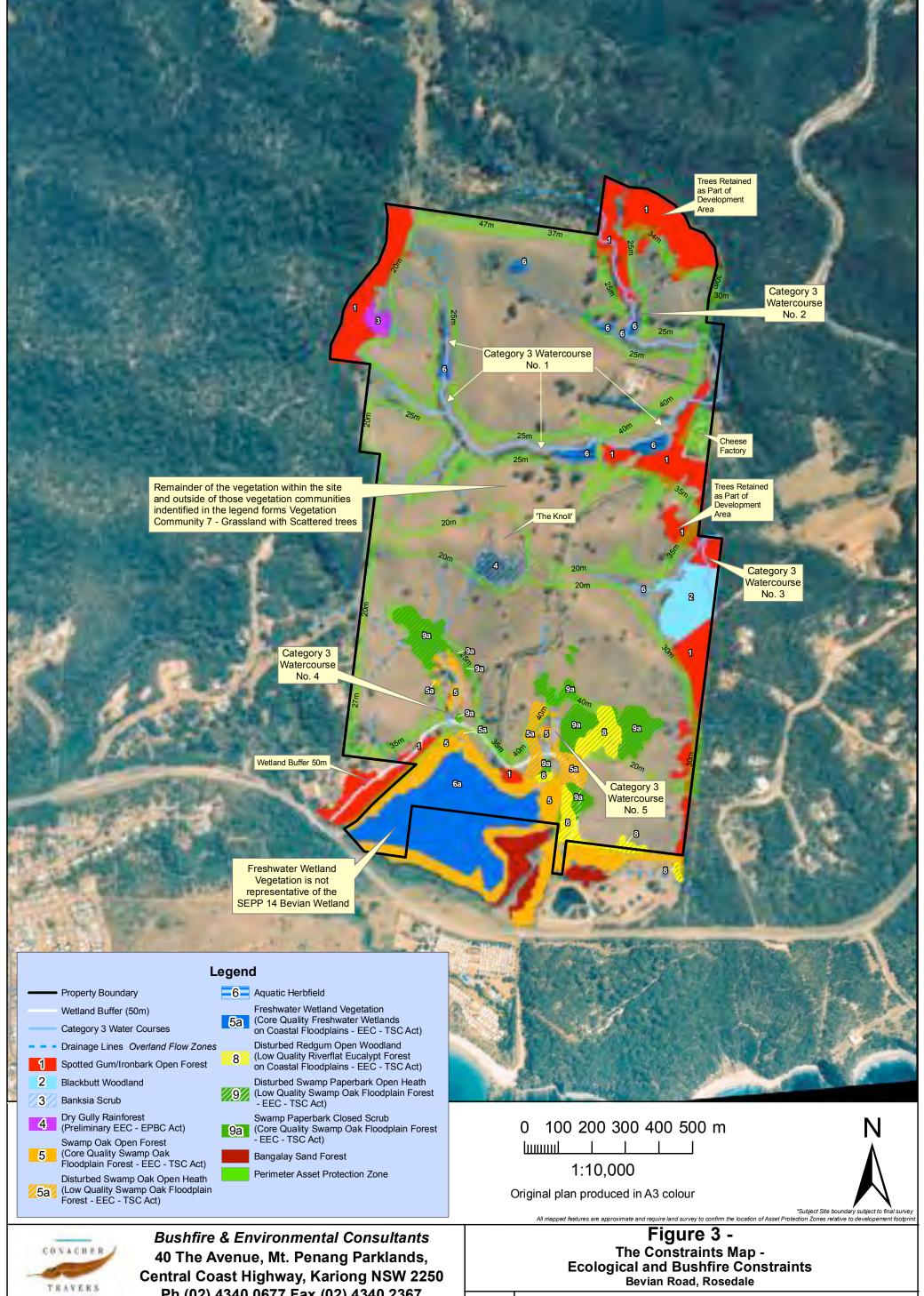


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Figure 2 -Aerial Appraisal Bevian Road, Rosedale

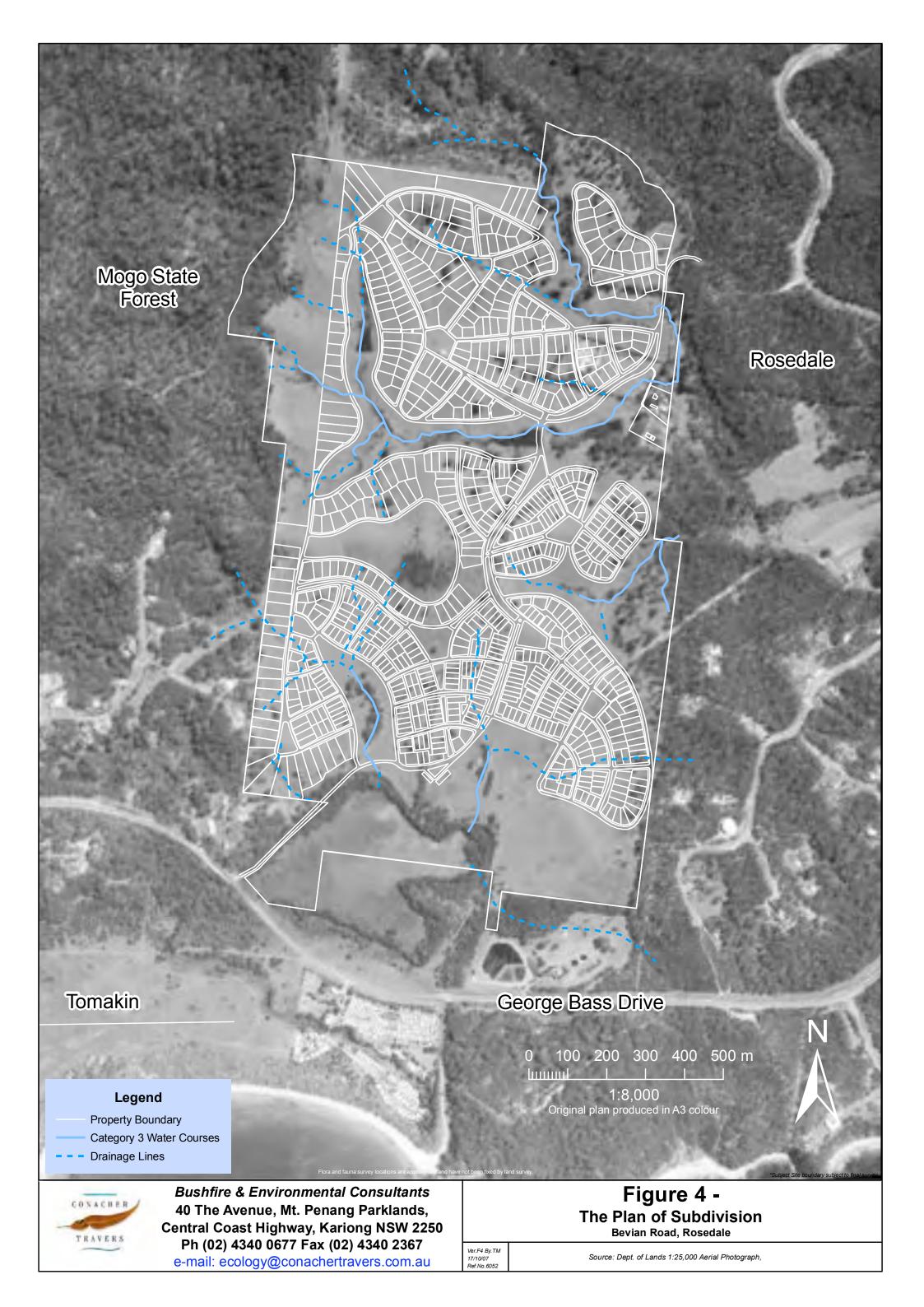
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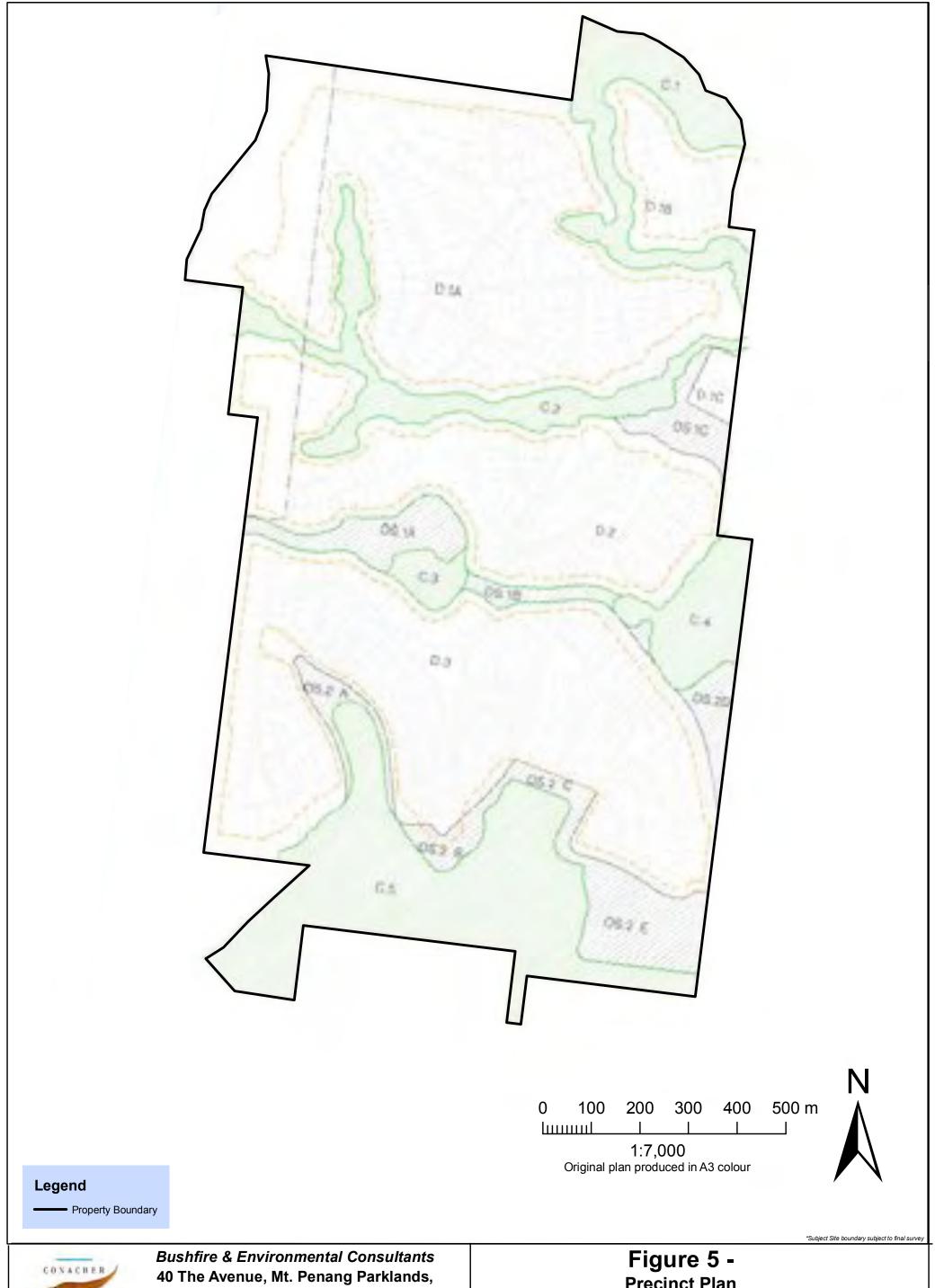


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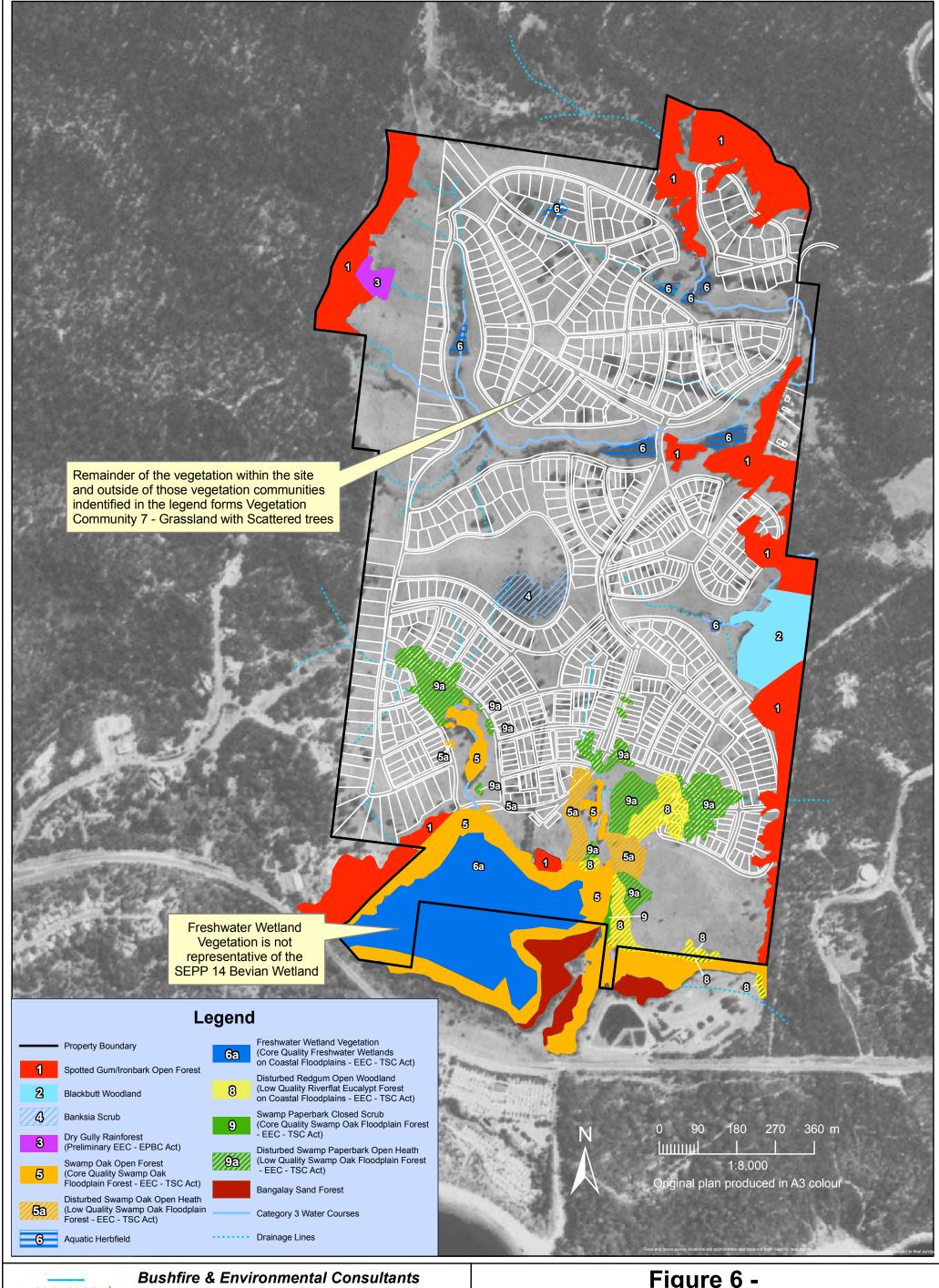


TRAVERS

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**Precinct Plan** Bevian Road, Rosedale

Ver.F5 17/10/07 Ref.No.6052





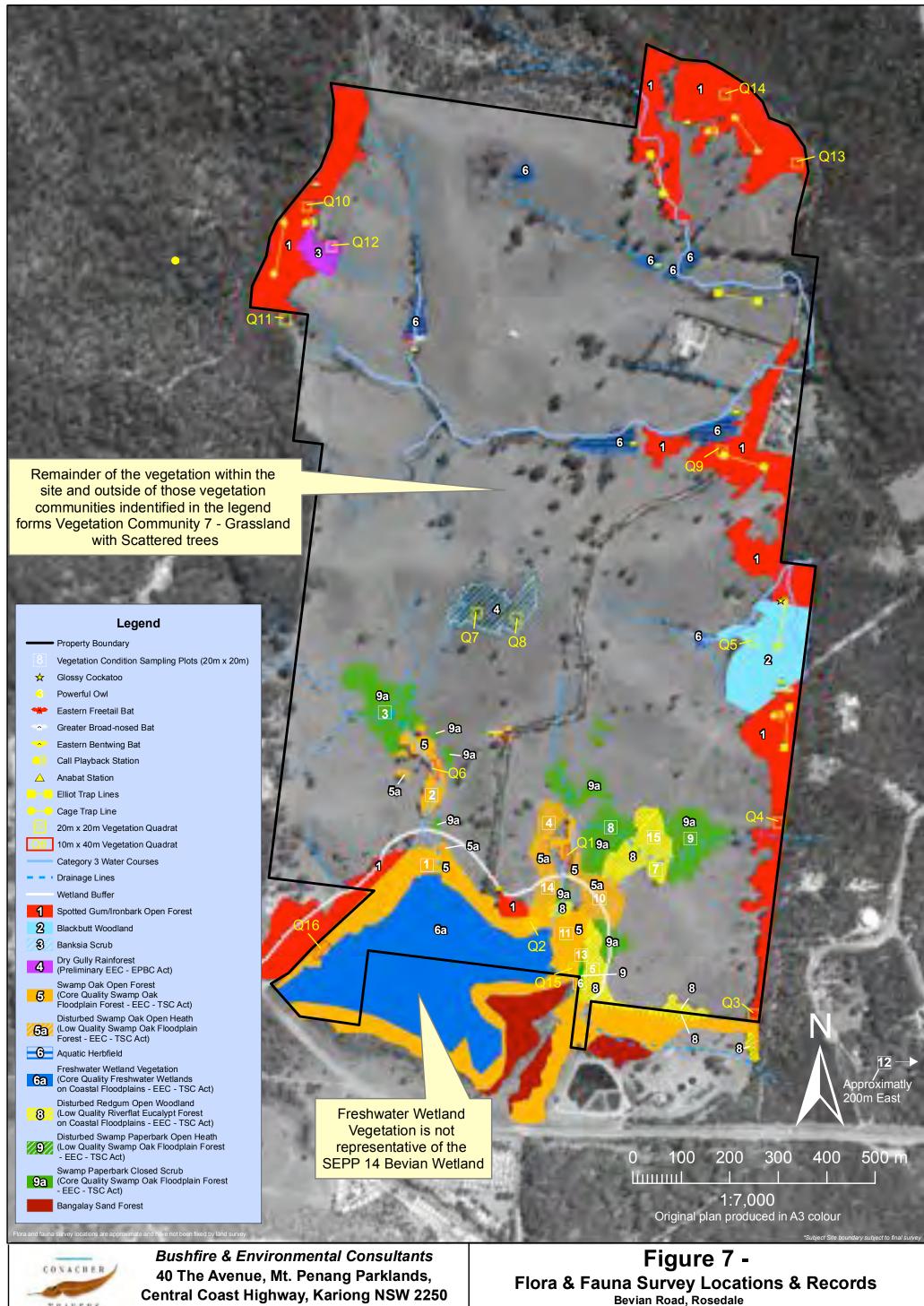
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# Figure 6 - Vegetation Communites

Bevian Road, Rosedale

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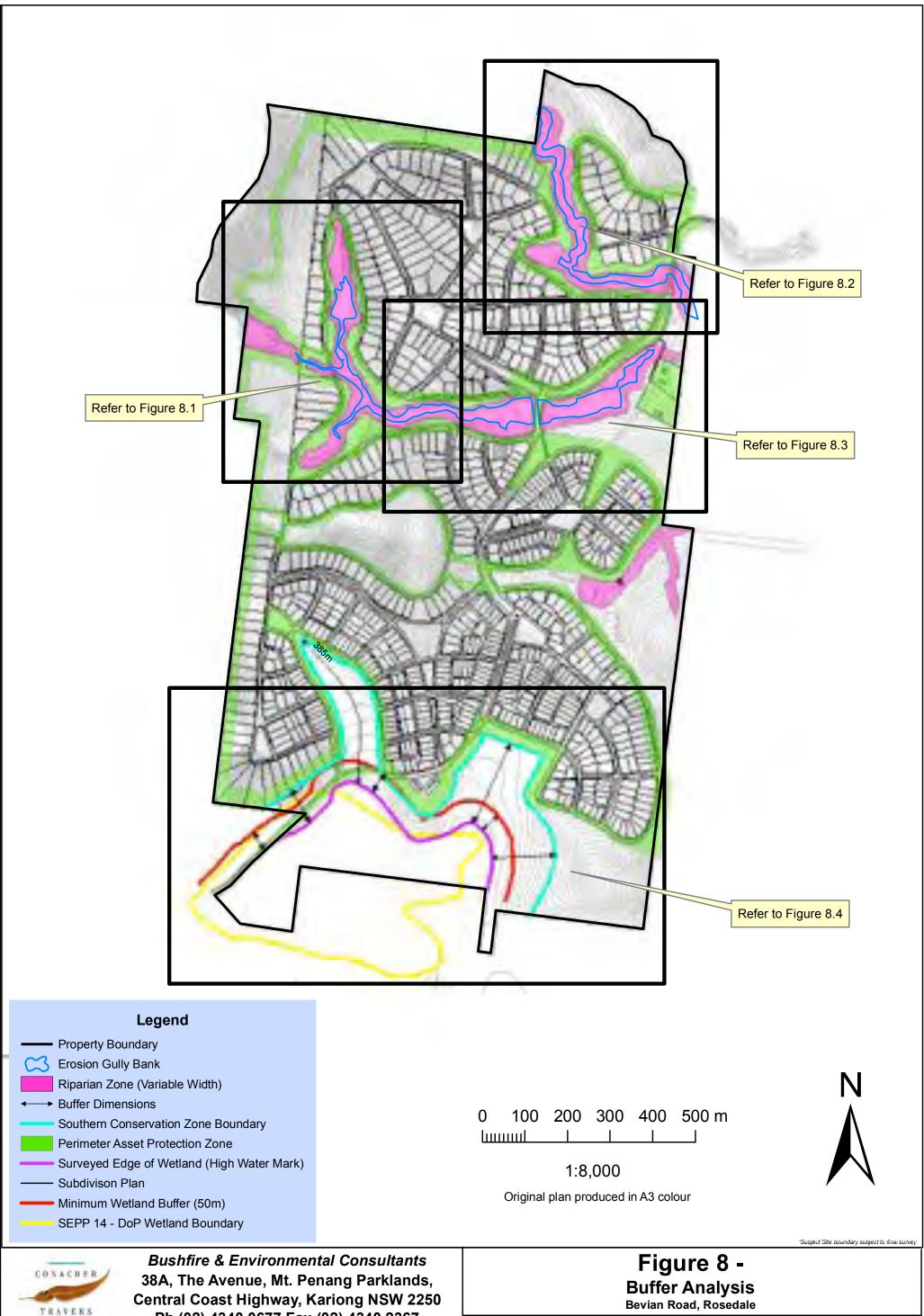




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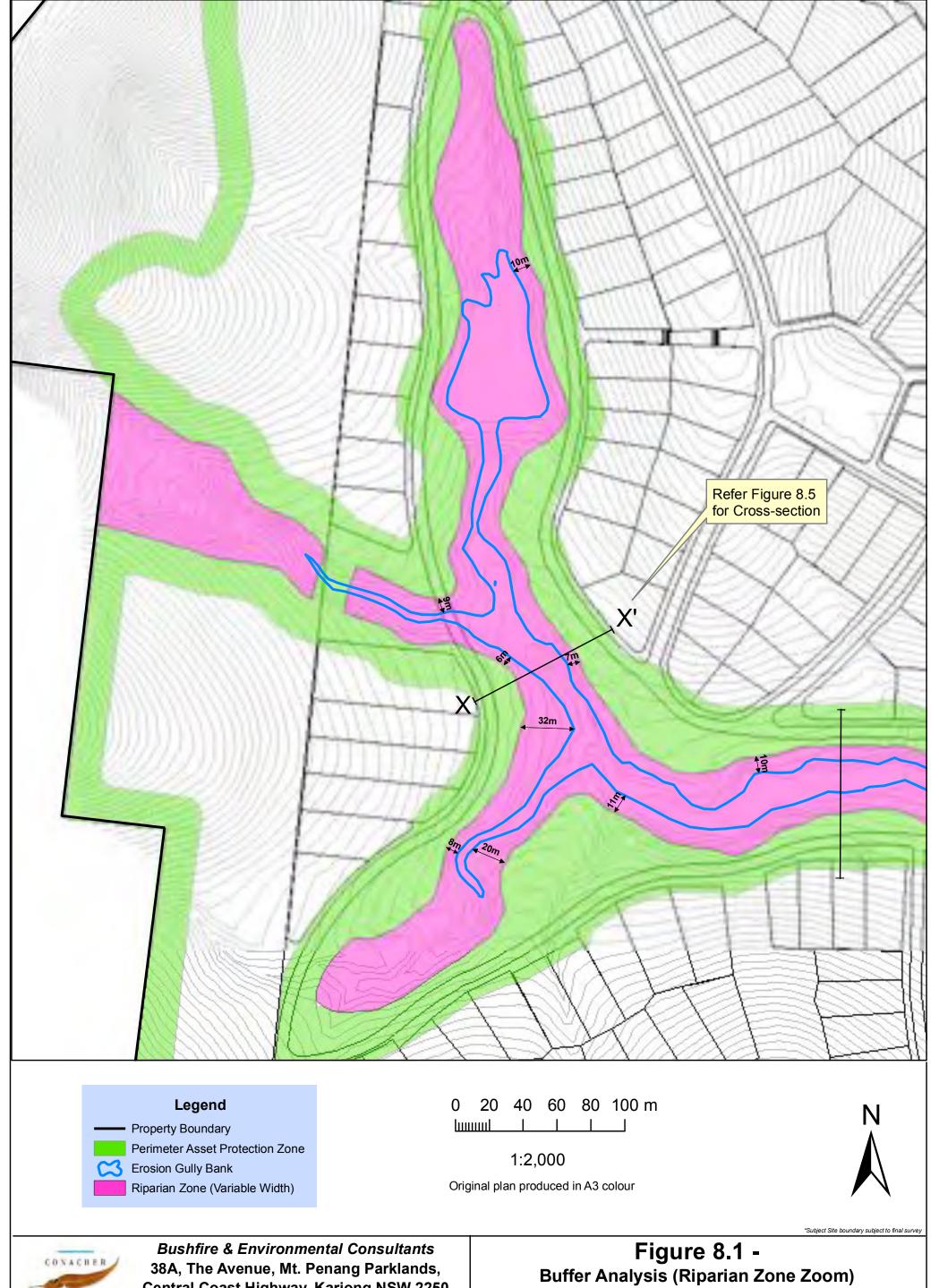


TRAVERS

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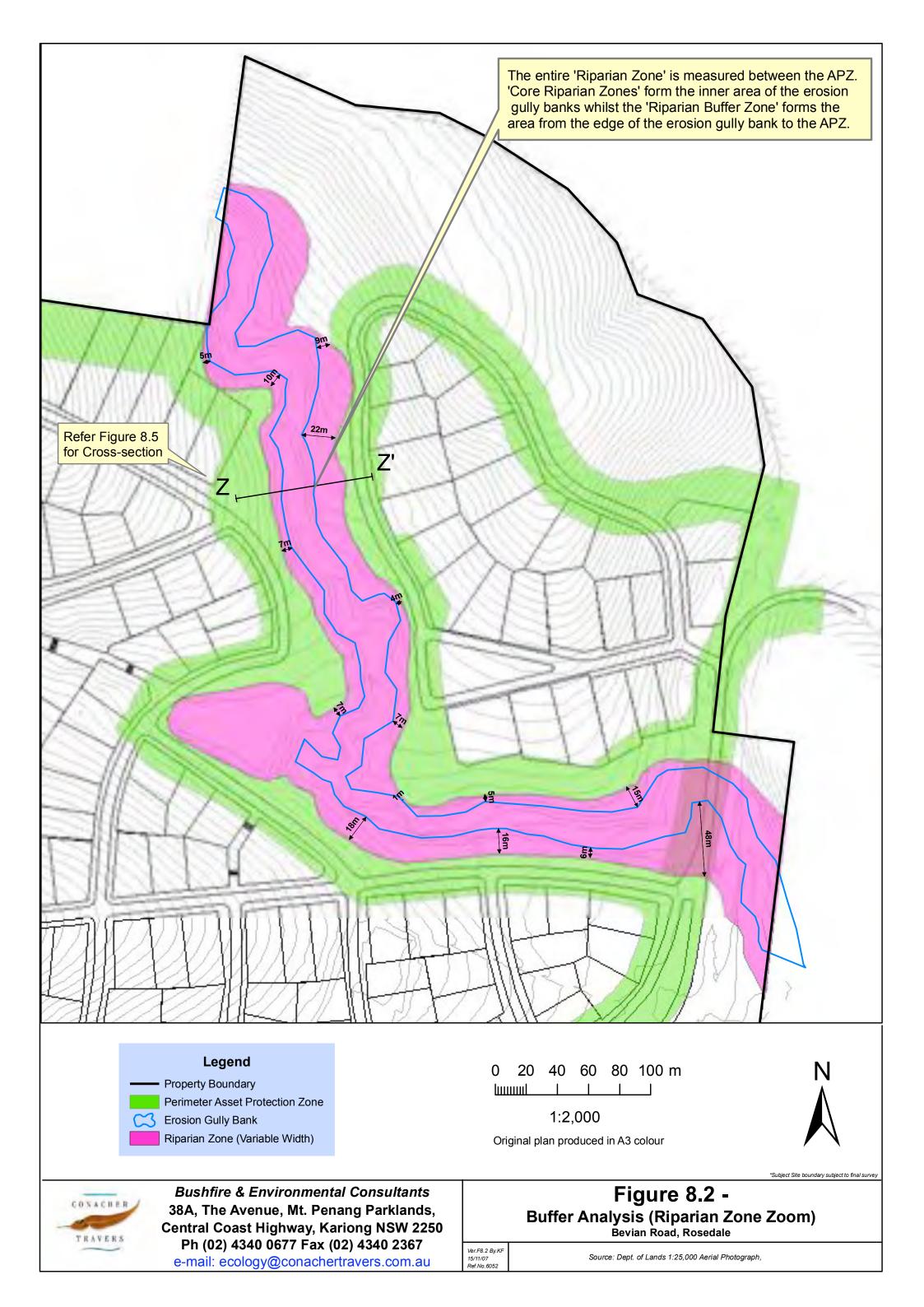


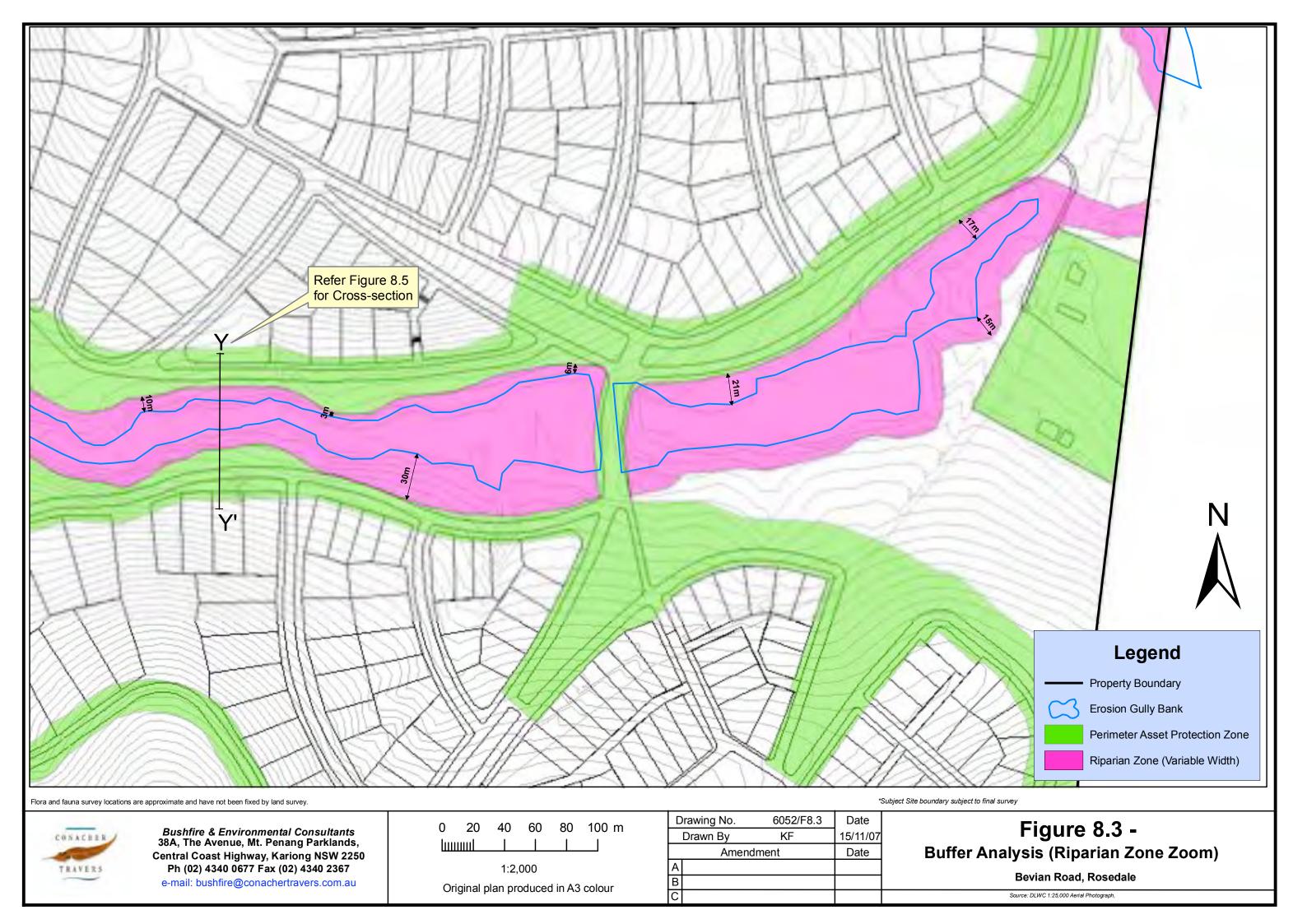
**Central Coast Highway, Kariong NSW 2250** Ph (02) 4340 0677 Fax (02) 4340 2367

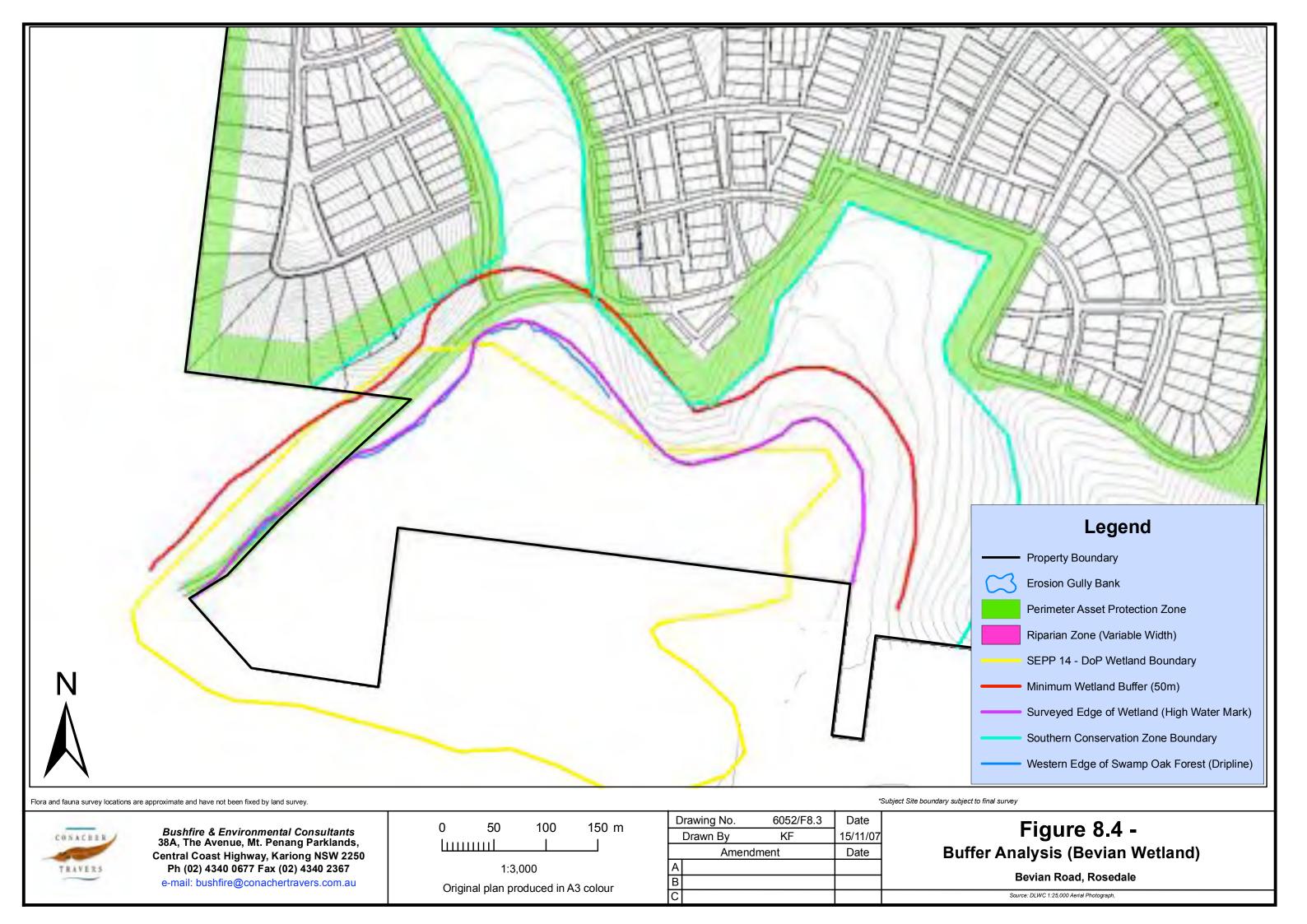
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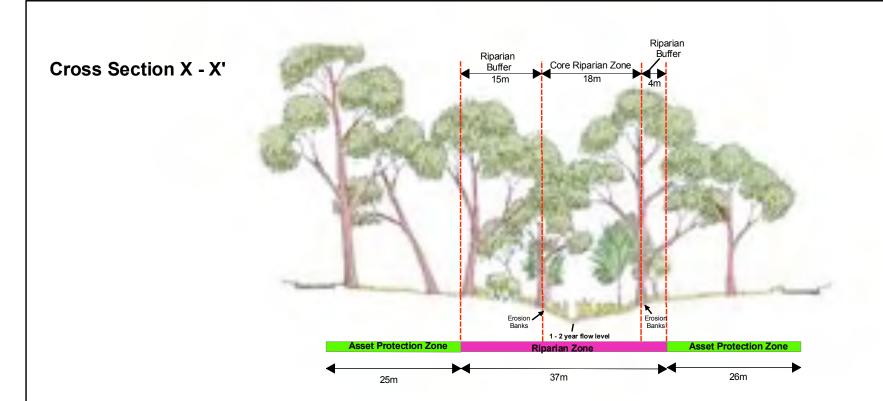
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Bevian Road, Rosedale

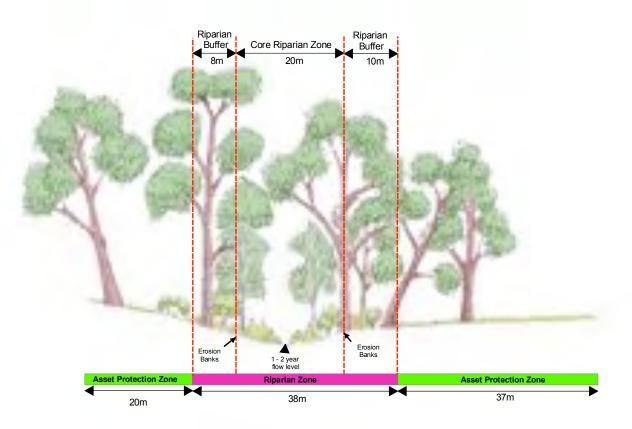




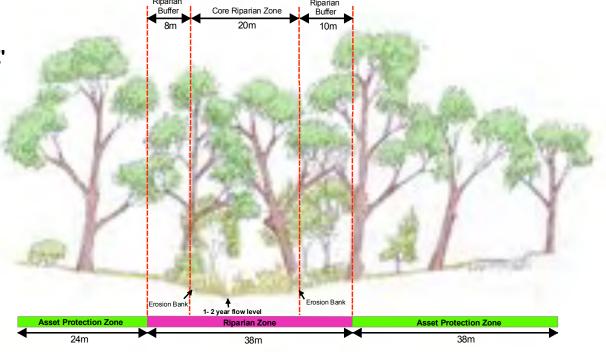


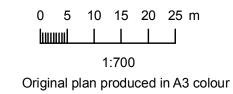


#### **Cross Section Y - Y'**



#### **Cross Section Z - Z'**







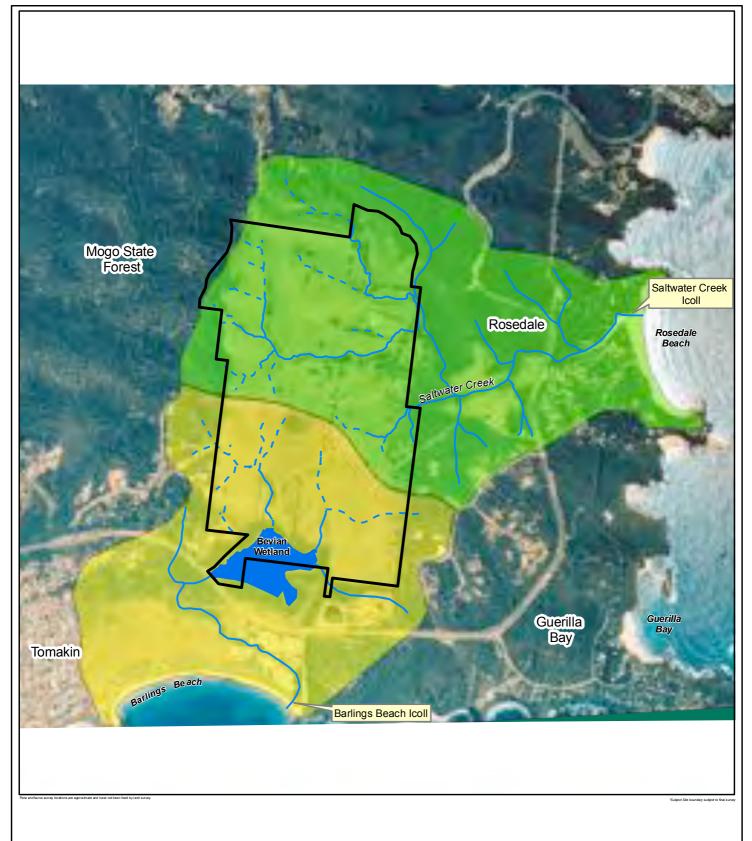
**Bushfire & Environmental Consultants** 38A, The Avenue, Mt. Penang Parklands, Central Coast Highway, Kariong NSW 2250 Ph (02) 4340 0677 Fax (02) 4340 2367

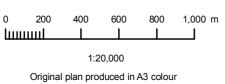
e-mail: ecology@conachertravers.com.au

Figure 8.5 -
<b>Buffer Analysis - Riparian Cross-sections</b>
Bevian Road, Rosedale

Ver.F8.5 By.TM/KF 15/11/07 Ref.No.605

Source: DLWC 1:25,000 Aerial Photograph,









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e-mail: ecology@conachertravers.com.au

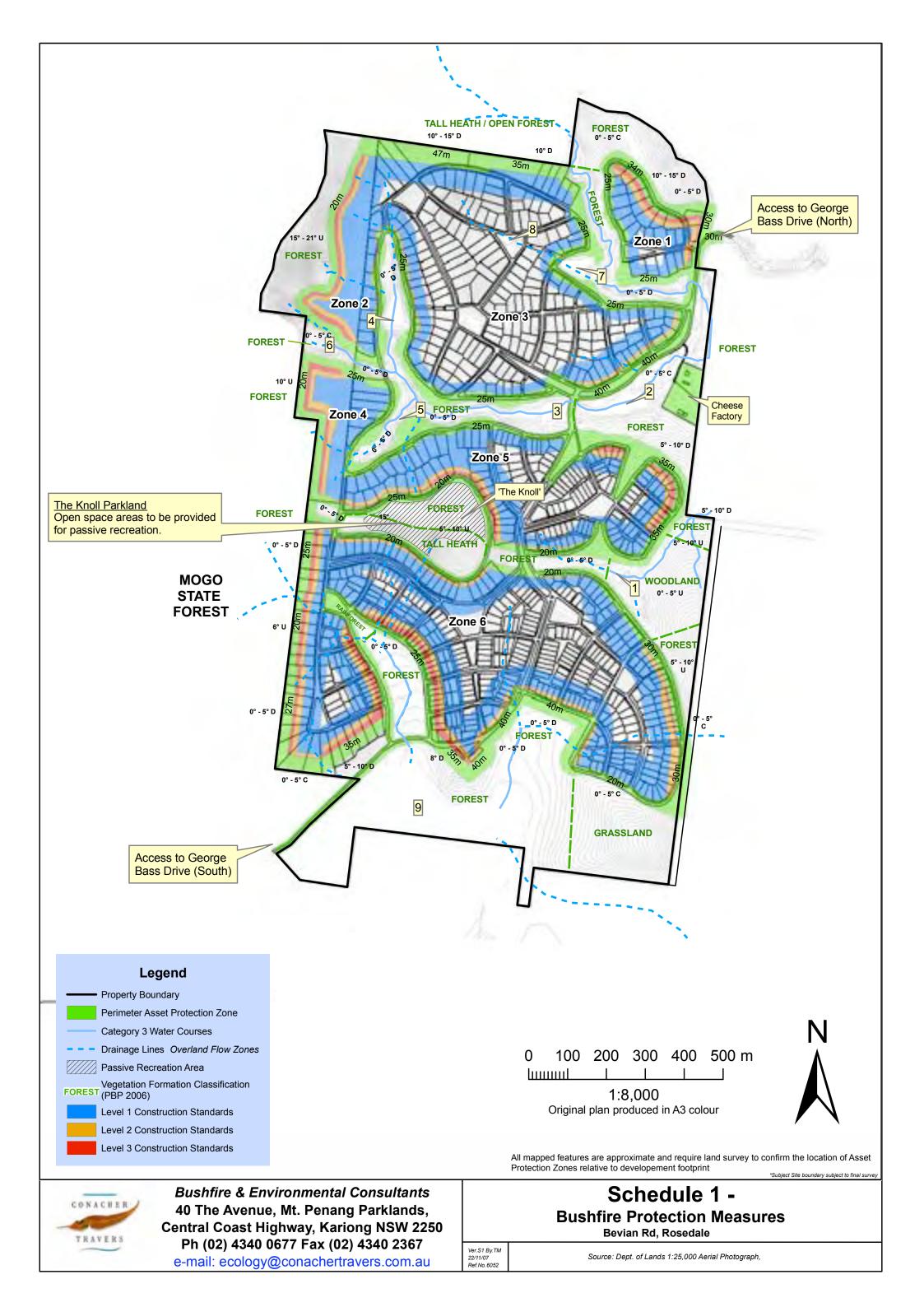
## Figure 9 Catchment Map

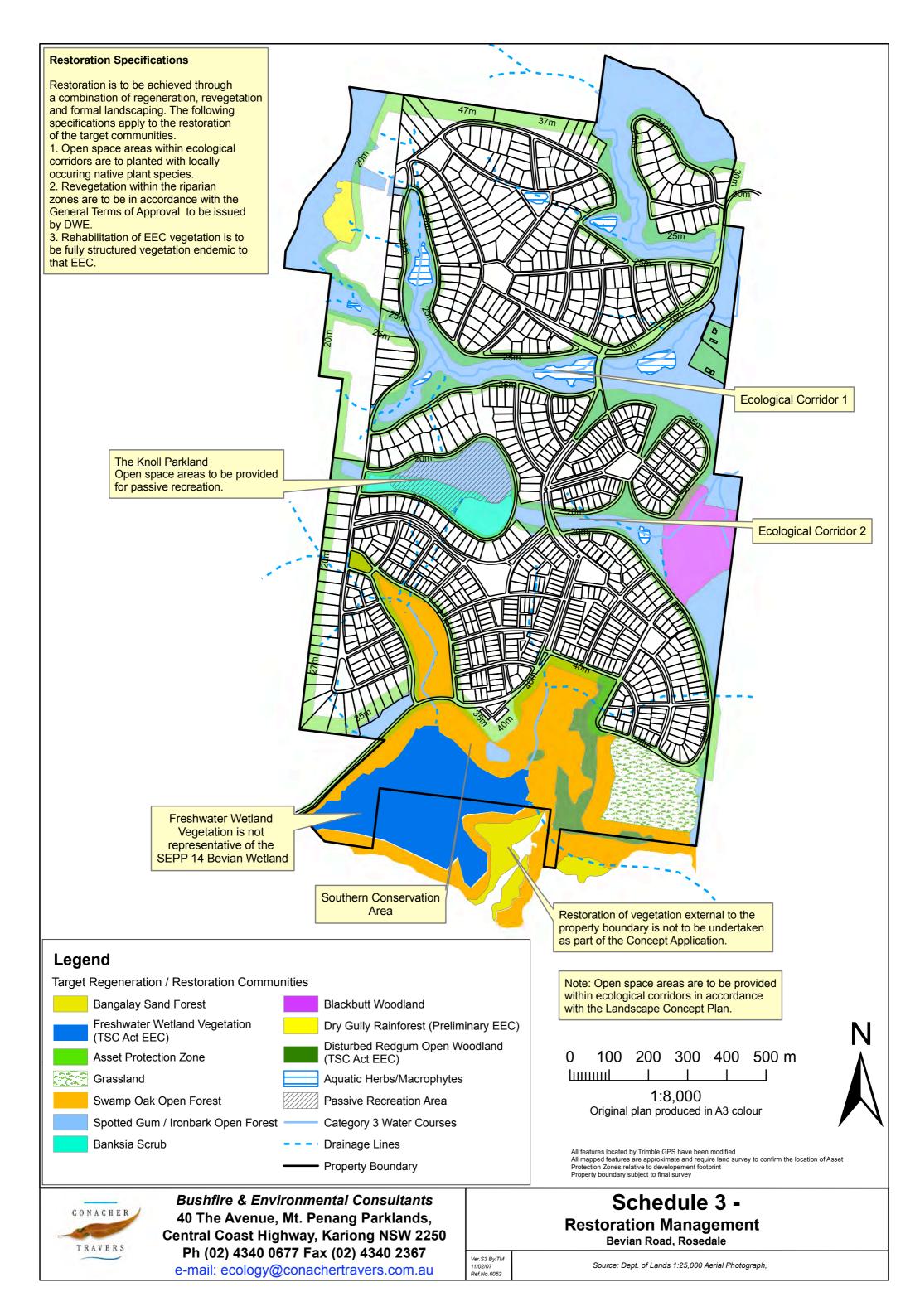
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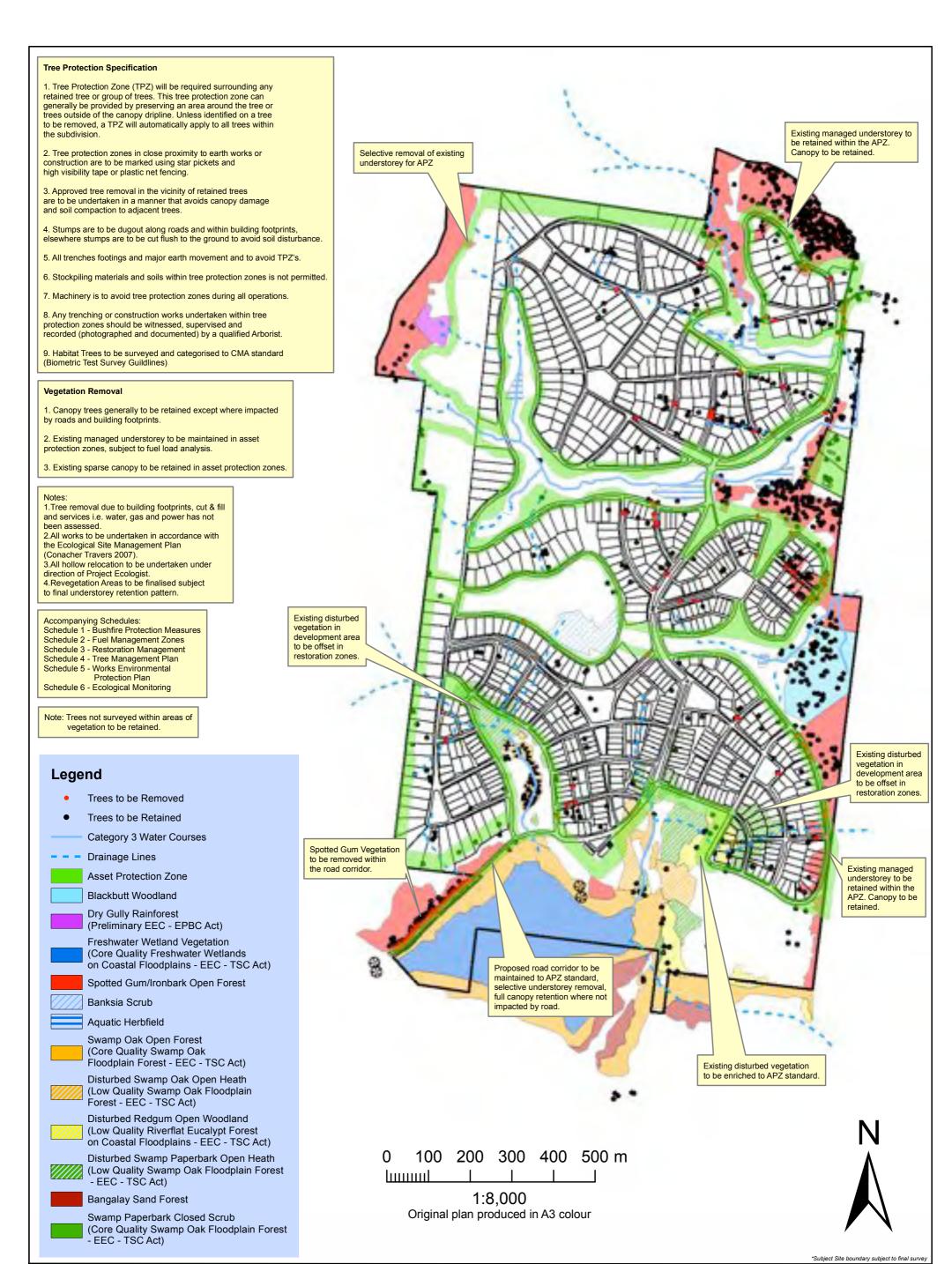
Source: DLWC 1:25,000 Aerial Photograph,

#### **SCHEDULES**

SCHEDULE 1 Bushfire Protection Measures
SCHEDULE 3 Restoration Management
Tree Management









Bushfire & Environmental Consultants 40 The Avenue, Mt. Penang Parklands, Central Coast Highway, Kariong NSW 2250 Ph (02) 4340 0677 Fax (02) 4340 2367

e-mail: ecology@conachertravers.com.au

Schedule 4 Tree Management Schedule
Bevian Road, Rosedale

Ver.S4 20/10/07 Ref.No.6052

#### **APPENDICES**

APPENDIX 1

Director General Requirements (NSW DoP 2006)



Contact: John Amold Phone: (02) 9228 6398 Fax: (02) 9228 6540

Email: john.a.amold@planning.nsw.gov.au

John Kass, Director Kass-hermes Urban Planning + Development 76 Drumalbyn Road, Bellevue Hill NSW 2023 Our ref: MP05\_0199

Your ref:

File: 9041393-1

#### Dear Mr Kass

Subject: Director-General's Environmental Assessment Requirements for the Environmental Assessment of a Concept Plan for a Proposed Residential Subdivision at George Bass Drive, Rosedale (MP05 0199)

The Department has received your application for the above project (Application Number: 05\_0199).

The Director General's Environmental Assessment Requirements (DGRs) for the environmental assessment of the project for a Concept Plan are attached to this correspondence at Attachment 1. These requirements have been prepared in consultation with the relevant government agencies including council, and have been based on the information that you have provided to date. Please note that the Director-General may alter these requirements at any time.

Attachment 2 lists the relevant plans and documents which are likely to be required upon submission of your proposal; however, this should be confirmed with the Department prior to lodgement.

It should be noted that the DGRs have been prepared based on the information provided to date. Under section 75F(3) of the Act, the Director-General may alter or supplement these requirements if necessary and in light of any additional information that may be provided prior to the proponent seeking approval for the project.

It would be appreciated if you would contact the Department at least two weeks before you propose to submit the Environmental Assessment for the project to determine:

- the fees applicable to the application;
- consultation and public exhibition arrangements that will apply; and
- number and format (hard-copy or CD-ROM) of the Environmental Assessment that will be required.

A list of some relevant technical and policy guidelines which may assist in the preparation of this Environmental Assessment are attached at Attachment 3.

Prior to exhibiting the Environmental Assessment, the Department will review the document to determine if it adequately addresses the DGRs. The Department may consult with other relevant government agencies in making this decision. If the Director-General considers that the Environmental Assessment does not adequately address the DGRs, the Director-General may require the proponent to revise the Environmental Assessment to address the matters notified to the proponent.

Following this review period the Environmental Assessment will be made publicly available for a minimum period of 30 days.

If your proposal includes any actions that could have a significant impact on matters of National Environmental Significance, it will require an additional approval under the Commonwealth Environment Protection Biodiversity Conservation Act 1999 (EPBC Act). This approval would be in addition to any approvals required under NSW legislation. If you have any questions about the application of the EPBC Act to your proposal, you should contact the Commonwealth Department of Environment and Heritage in Canberra (6274 1111 or http://www.deh.gov.au).

If you have any queries regarding these requirements, please contact John Arnold on 9228 6398 or email john.a.arnold@planning.nsw.gov.au.

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( ) (

Yours sincerely

Chris Wilson

**Executive Director** 

as delegate for the Director General

# Attachment 1 Director-General's Environmental Assessment Requirements

Section 76F of the Environmental Planning and Assessment Act 1979

Application number	05_0199		
Project	A Concept Plan Application for Proposed Residential Subdivision at George Bass Drive, Rosedale		
Location	Lots 11, 29, 32, 72, 102, 118, 119 and 213 in DP755902; Lot 2 DP627034 and Lot 2 DP623340		
Proponent	Marsim		
Date issued	December 2006		
Expiry date	2 years from date of issue		
General requirements	The Environmental Assessment (EA) for the Concept Plan must include:  An executive summary: A outline of the scope of the project including:  (i) Any development options: (ii) Justification for the project taking into consideration any environmental impacts of the project, the suitability of the site and whether the project is in the public interest; (iii) Outline of the staged implementation of the project, if applicable; A thorough site analysis and description of existing environment. Consideration of any relevant statutory and non-statutory requirements, in particular relevant provisions of Environmental Planning Instruments, and South Coast Regional Strategy and Development Control Plans as well as impacts, if any, on matters of national environmental significance under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999; Where relevant, demonstrate compliance with BCA and relevant Australian Standards for proposed building; traffic, road and parking; utilities; noise and flooding; An environmental risk analysis of the project including consideration of the issues raised during consultation; An assessment of the project; The plans and documents outlined in Attachment 2; A signed statement from the author of the Environmental Assessment certifying that the information contained in the report is neither false nor misleading; A Quantity Surveyor's certificate of cost to verify the capital investment value of the project; and An assessment of the key issues specified below and a table outlining how these key issues have been addressed.		
Key issues	The Environmental Assessment for the Concept Plan must address the following key issues:  1. Conceptual Layout 1.1. Address the requirements of the Eurobodalla Rural Local Environmental Plan 1987 (as amended) and Eurobodalla Council's DCP No. 160 - Rosodalo and DCP No. 157 - Rural Subdivision. Demonstrate consistency with all relevant zone objectives and standards.  1.2. Identify the extent of potential development footprints, building envelopes		

and built form controls, and any significant vegetation to be removed.

 Address safety, provision of public reserves, potential perimeter road layouts, pedestrian and bicycle movement to, within and through the site.

Demonstrate a clear delineation between public and private spaces.

 Identify the indicative staging of the development and the future management of the land (tomens, strata and/or community title).

2. Visual Impact, Amenity and Scale

2.1. Demonstrate suitability of the proposal with the surrounding area in relation to potential character, bulk, scale and visual amenity of development resulting from the development having regard to the Coastal Design Guidelines of NSW (2003), NSW Coastal Policy (1997), State Environmental Planning Policy No. 71 — Coastal Considerations (specifically Clauses 2 and 8) and the Eurobodalle Urban Settlement Strategy.

2.2. In accordance with the recommendations of the Independent Review Panel for Sensitive Lands demonstrate how the development will ensure the visual separation between Barlings Beach and Rosedale, and along

George Bass Drive between Tomakin and Rosedale North.

3. Social and Community

3.1. Demonstrate that the development achieves a range of housing types to

meet anticipated demographic needs.

3.2. Address the social and economic context of the development in terms of infrastructure requirements, access, public transport, community services and facilities, including medical and educational needs.

#### 4. Environmental Protection

4.1. Address measures for the conservation of animals and plants and their habitats within the meaning of the Threatened Species Conservation Act 1995 having regard to the Draft Guidelines for Threatened Species Assessment (DEC & DPI July 2005). Address the measures for the conservation of aquatic species within the meaning of the Fisheries Management Act 1994.

4.2. Outline the measures for the conservation of existing wildlife corridor values and/or connective importance of vegetation on the subject land, including areas identified as being of high and/or very high ecological

status.

4.3. Demonstrate how the proposal will allow for the future transition of areas of high environmental conservation value to the new Environmental Conservation Zone 2 areas under the LEP template, particularly in relation to riparian corridors, wetlands, and areas containing Endangered Ecological Communities (EEC's)

5. Riparian Management

5.1. In accordance with the objectives of the draft Eurobodalia Riparian Corridor Study (RCOS) address riparian zone buffering to the wetland and drainage lines demonstrating how they will be protected and how the downstream environment will not be adversely affected by the proposed development.

5.2. Outline management measures to maintain/improve the stability, water quality, habitat and natural function of the wetland. A core riparian zone extending at least 40 metres from the high water mark plus a further 10

metre buffer is required.

5.3. A 10 metre riparian buffer zone extending from the 'top of the bank' is required to all drainage lines within the development area.

Water Cycle Management

 Address NSW Coastal Policy, Wellands Management Policy, Estuary Management Policy, State Rivers Policy and Estuary Policy.

- 6.2. Address potential impacts on the water quality of surface and groundwater, on all water courses, and on ground water dependent ecosystems. Consideration must also be given to the protection of the Bateman's Marine Park.
- 6.3. Address and outline measures for an Integrated Water Cycle Management Plan (including stormwater concept) based upon Water Sensitive Urban Design principles. This should include measures to ensure no net increase in nutrient/pollutant loads entering the watercourses including both construction and post construction operational management measures.

#### Traffic and Access

7.1. Prepare a Traffic Impact Study (TIS) in accordance with the RTA Guide

to Traffic Generation Developments.

7.2. Identify the needs to upgrade roads/junctions and improvement works to ameliorate any traffic inefficiency and safety impacts associated with the development, particularly in relation to access points from George Basis Drive. This should include identification of pedestrian movements and appropriate treatments.

7.3. Consult with Eurobodalla Shire Council and the Department of Lands

with regard to management and ownership of Crown roads.

8. Hazard Management and Mitigation

8.1. Address the requirements of Planning for Bush Fire Protection 2001 (RFS) in particular the provision of adequate access for fighting bushfire, adequate asset protection zones and water supply for bushfire suppression operations.

8.2. Prepare a plan of management for fuel management including the provision and maintenance of APZ's, natural area, buffer zones and

revegetation.

Address AS 3959: Building in Bush Fire Prone Areas.

- 8.4. Demonstrate the use of best management sediment and erosion techniques particularly to the area immediately surrounding the SEPP 14 Bevian Wetland.
- 8.5. Undertake a Flood Study having regard to the requirements of the NSW Floodplain Management Manual. Address potential impacts of flooding on the development, the impact of development on flood behaviour (including cumulative impacts), and the impact of flooding on the safety of people over a full range of possible floods up to the probable maximum flood (PMF) and mitigation measures.

8.6. Address sea level rise and coastal inundation restricting where

necessary development in low lying areas.

#### Infrastructure Provision

9.1. Address existing capacity and requirements of the development for sewerage, water and electricity in consultation with relevant agencies.

9.2. Identify staging, if any, of infrastructure works.

9.3. Address provision of public services and infrastructure having regard to

the Council's Section 94 Contribution Plans.

9.4. Prepare an Odour Management Study to address potential odour issues in conflict with provision of the POEO Act. (note: the cost of odour management studies and cost of design and construction of any odour control works at the STP are to be fully funded by the applicant).

9.5. An appropriate buffer distance should be identified in accordance with the Assessment and Management of Odour from Stationary Sources in NSW (Technical Framework and Supporting Technical Notes (DEC)

November 2006III.

#### 10. Heritage 10.1. Address the draft Guidelines for Aboriginal Cultural Heritage Impact Assessment can Community Consultation (DEC, July 2005). 10.2. Identify whether the site has significance in relation to Aboriginal cultural heritage and identify appropriate measures to preserve any significance. 10.3. Identify any other items of heritage significance and provide measures for conservation of such items. 11. Noise 11.1. Address potential road traffic impacts on future residents and identify appropriate mitigation measures. 11.2. Address potential impacts of demolition, construction and operational noise. 12. Soil and Contamination 12.1. Identify the presence and extent of acid sulfate soils on the site and outline appropriate mitigation measures, Identify areas of contamination on site and appropriate mitigation measures. The level of assessment shall be consistent with the Acid Sulfate Soil Manual by ASSMAC. Consultation You should undertake an appropriate and justified level of consultation with the following agencies during the preparation of the environmental assessment: (a) Agencies or other authorities: Eurobodalla Shire Council: NSW Department of Planning - South Coast Regional Office: . NSW Department of Environment and Conservation; NSW Department of Natural Resources: NSW Department of Primary Industries: NSW Department of Education and Training: NSW Department of Health NSW Rural Fire Service: NSW State Emergency Services; and relevant Aboriginal Land Council contact. Document all community consultation undertaken to date or discuss the proposed strategy for undertaking community consultation. This should include any contingencies for addressing any issues arising from the community consultation and an effective communications strategy. The consultation process and the issues raised should be described in the Environmental Assessment Deemed refusal 60 days period Electronic documents presented to the NSW Department of Planning for **Electronic Documents** publication via the Internet must satisfy the criteria:-Adobe Acrobat PDF files and Microsoft Word documents must be no bigger that 1.5 Mb. Large files of more than 1.5 Mb will need to be broken down and supplied as different files. File names will need to be logical so that the Department can publish them in the correct order. Avoid sending documents that are broken down in more than 10 files. Image files should not be bigger than 2Mb. The file names will need to be clear and logical so the Department can publish them in the correct order. Graphic images will need to be provided as [.gif] files. Photographic images should be provided as [.jpg] files.



- Large maps will need to be presented as individual files and will need to be calibrated to be no more than 2Mb each.
- Images inserted into the document will need to be calibrated to produce files smaller than 1.5Mb. Large images will need to be presented as individual files and will need to be calibrated to be no more than 2Mb each. The file names will need to be clear and logical so the Department can publish them in the correct order.

Alternatively, these electronic documents may be placed on your own web site with a link to the Department of Planning's website.

## Attachment 2 Plans and Documents to accompany the Application

# Plans of the development

The following plans, architectural drawings and diagrams of your proposal as well as the relevant documents will be required to be submitted for the Concept Plan:

- The existing site survey plan is to be drawn to 1:500 scale (or other appropriate scale) and show:
  - the location of the land, the measurements of the boundaries of the land, the size of the land and north point;
  - the existing levels of the land in relation to buildings and roads;
  - location and height of existing structures on the site; and
  - location and height of adjacent buildings and private open space.
- An aerial photograph outlining the subject site and surrounding area (at an appropriate scale).
- 3. A Site Analysis Plan must be provided which identifies existing natural elements of the site (including all hazards and constraints), existing vegetation, property dimensions, footpath crossing levels and alignments, existing pedestrian and vehicular access points and other facilities, slope and topography, natural features such as watercourses, rock outcrops, utility services, boundaries, orientation, view corridors and all structures on neighbouring properties where relevant to the application (including windows, driveways etc.
- A locality/context plan drawn to 1:500 scale (or other appropriate scale) should be submitted indicating:
  - significant local features such as parks, community facilities and open space, water courses and heritage items;
  - the location and uses of existing buildings, shopping and employment areas; and
  - traffic and road patterns, pedestrian routes and public transport nodes.
  - The existing site plan and locality plan should be supported by a written explanation of the local and site constraints and opportunities revealed through the above documentation.
- The Environmental Assessment in accordance with the Director-General's Environmental Assessment Requirements as outlined in Attachment 1.
- 6. Conceptual layout plans to illustrate the following:-
  - Conceptual layout of the proposed development including staging:
  - North point:
  - Name of the road fronting the site and other surrounding major roads;
  - Title showing the description of the land with lot and DP numbers etc;
  - Vegetation retention;
  - Access points and road layout;
  - Any easements, covenants or other restrictions either existing or proposed on the site;
  - Type of subdivision proposed (Torrens, strata and/or community title).
- 7. Other Plans including (where relevant):

Infrastructure Concept Plans – conceptual drawings indicating proposed infrastructure including roads, drainage, water, sewerage and earthworks. Stormwater Concept Plan - illustrating the plan for stormwater management of the cite and must include details of any drainage lines and major overland flow paths through the site, stormwater treatment measures and any discharge points to existing drainage systems.

	Flood Evacuation Plan – plan showing the proposed access from the site during extreme flood events.  Erosion and Sediment Control Plan – plan or drawing that shows the nature and location of all erosion and sedimentation control measures to be utilised on the site;  Landscape Concept Plan – plan or drawing that shows the basic detail of planting design and plat species to be used, listing botanical and common names, mature height and spread, number of plants to be utilised and surface treatments (i.e. pavers, lawn etc);
Specialist advice	Specialist advice, where required to support your Environmental Assessment, must be prepared by suitably qualified and practising consultants.
Documents to be submitted	<ul> <li>15 hard copies of the Environmental Assessment;</li> <li>15 sets of architectural and landscape plans to scale, including set one (1) set at A3 size (to scale); and</li> <li>4 copy of the Environmental Assessment and plans on CD-ROM (PDF format), not exceeding 5Mb in size.</li> </ul>

# Attachment 3 Technical and Policy Guidelines

The majority of these documents can be found on the relevant Departmental Websites, on the NSW Government's on-line bookshop at <a href="http://www.bookshop.nsw.ggv.au">http://www.bookshop.nsw.ggv.au</a> or on the Commonwealth Government's publications website at <a href="http://www.publications.ggv.au">http://www.publications.ggv.au</a>.

Aspect	Policy /Methodology
Blodiversity	
Flora and Fauna	Draft Guidelines for Threatened Species Assessment (DEC, 2004)
Bushfire	
	Planning for Bushfire Protection 2001 (NSW Rural Fire Service)
	Australian Standard 3959 - Building in Bushfire Prone Areas
Coastal Planning & Wate	r Bodies
	NSW Coastal Policy 1997 - A sustainable Future for the New South Wates Coast (Department of Urban Affairs & Planning, 1997)
	Coastal Design Guidelines for NSW, Coastal Council, March 2003
	NSW Wedands Management Policy (DLWC, March 1995)
	NSW State Rivers and Estuaries Policy (DLWC, 1992)
	NSW Estuary Management Manual (DLWC, 1992)
	Constructed Wetlands Manual (DLWC, 1998)
Heritage	PART OF THE PART O
	Draft guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (DEC, July 2005)
	NPWS Aboriginal Cultural Heritage Standards and Guidelines Kit - Working Dreft (NPWS, September 1997)
	Aboriginal cultural heritage: standards and guidelines (DEC 2005)
	Protecting Aboriginal Objects and Places - Interim Guidelines for Community Consultation (DEC 2005)
Soils & Contamination	
	Contaminated Land: Planning Guidelines for Contaminated Land Department of Urban Affairs and Planning and the NSW EPA, Octobe 1995.
	Managing Land Contamination: Planning Guidelines - SEPP 55 - Remediation of Land (NSW EPA, 1998)
	Contaminated Sites - Guidelines for Consultants Reporting or Contaminated Sites (NSW EPA, 1997)
	Contaminated Sites - Guidelines on Significant Risk of Harm and Duty to Report ( NSW EPA, 1999)
Traffic, Transport & Ped	estrian & Cyclist Facilities
	Guide to Traffic Generating Developments (RTA, 1993)
	RIA Road Design Guide (RTA, 1996)
	Planning Guidelines for Walking and Cycling (DIPNR & RTA, December 2004)
	Guide to Traffic Engineering and Guide to Geometric Design of Rura Roads (Ausroads, 2003)

Aspect	Policy / Methodology
Water	
Water Quality	Australian & New Zealand Guidelines for Fresh & Marine Water Quality (Australian & New Zealand Environment & Conservation Counci (ANZECC), October 2000)
	National Water Quality Management System - Australian Guidelines for Water Quality Monitoring and Reporting (ANZECC 2000)
	Integrated Water Cycle Management Guidelines for NSW Local Utilities, Oct 2004
	Water Quality and River flow Objectives (DEC, 2000)
	State Water Management Outcomes Plan Order 2002
	NSW Guidelines for Urban & Residential Use of Reclaimed Water (NSW Water Recycling Coordination Committee, 1993)
Wastewater	National Water Quality Management Strategy: Guidelines for Sewerage Systems – Effluent Management (ARMCANZ/ANZECC 1997)
	National Water Quality Management Strategy: Guidelines for Sewerage Systems – Use of Reclaimed Water (ARMCANZ/ANZECC 2000)
	Environmental Guidelines for the Utilisation of Treated Effluent by Irrigation (NSW DEC 2004)
	Environment and Health Protection Guidelines: Onsite Sewage Management for Single Households (1996)
Flooding & the Floodplain	NSW Government Floodplain Development Manual - the Management of Flood Liable Land (DIPNR, 2005)
Groundwater	NSW Groundwater Policy Framework Document - General (DLWC 1997)
	NSW State Groundwater Quality Protection Policy (DLWC, 1998)
	NSW State Groundwater Dependent Ecosystems Policy (DLWC, 2002)
Stormwater	Managing Urban Stormwater :Soils and Construction (NSW Landcom 2004)
	Managing Urban Stormwater: Source Control (DEC, 1998)
	Managing Urban Stormwater: Treatment Techniques (DEC, 1998)
	Better Drainage: Guidelines for the Multiple Use of Drainage System (PlanningNSW, 1993)
Noise and Vibration	A CONTRACTOR OF THE REAL PROPERTY OF THE REAL PROPE
	NSW Industrial Noise Policy (NSW EPA, 1999)
	NSW Environmental Criteria for Road Traffic Noise (NSW EPA, 1999)
	Environmental Noise Control Manual (NSW EPA, 1994)

#### **ADDENDUM**

ADDENDUM 1 Respons

Response to the Department of Planning 25 January 2008

25 January 2008

Paulina Hon Senior Environmental Officer Planning Officer Department of Planning GPO Box 39 23-33 Bridge Street SYDNEY NSW 2000

Cc Murray Offord – MARSIM

Dear Paulina



#### Re: Proposed Residential Subdivision, George Bass Drive, Rosedale (MP05\_0199) DECC Comments on Environmental Assessment

In response to comments from the Department of Environment and Climate Changes, (Correspondence dated 8 January 2008 DECC Ref: FIL06/1793) *Travers Environmental* provides the following comments.

The Environmental Assessment undertaken by Kass-Hermes 2007 is the application document for statutory planning of the Bevian Road Concept Application. Where as the Ecological Assessment is the overriding ecological document that should be reviewed by DECC in terms of adequacy, along with the Conservation Land Use Management Plan (CLUMP) and the Ecological Site Management Plan (ESMP).

The Client, Marsim, seeks approval for a <u>concept application</u> which we have demonstrated can achieve appropriate ecological outcomes. There will be further detailed design and detailed development applications which will consider detailed design issues, such as hollow bearing trees which can be properly assessed at that time.

By way of introduction it was vital that the biodiversity considerations for this project were considered from the outset. Marsim followed our advice to ensure protection of the existing biodiversity on-site and in particular the Bevian Wetland.

To that end we prepared a Conservation Land Use Management Planning (CLUMP) that sought to define the land use capabilities of the site based on extensive ecological and environmental analysis. The CLUMP specifically dealt with the following matters;

- Conservation values of the site including vegetation communities, threatened species, natural wildlife corridors, and other natural features of the site,
- Scale of any development and its integration with the existing landscape,
- Implementation of the various obligations for conservation, maintenance and protection of the environment,

- Future environmental validation of the development applications,
- Verification that requirements, obligations and environmental targets and outcomes are achieved and maintained.

The CLUMP principally relates to ecological, conservation and bushfire values relevant to the proposed development and the local environs. Consideration of all these issues has been addressed within the *Statement of Commitments* which is proposed to be finalised at the DA stage where greater detail and surety can be provided for environmental protection.

This CLUMP combines the expertise of ecology, stormwater, water quality, wetland management, bushfire etc' and aims to protect the existing environment and the proposed restored environment by using the CLUMP approach as the guiding influence for any development on the site. It aims to provide a set of clear planning controls that gave protection to the identified values of the site.

The CLUMP was supplied as part of the document set for the project and should be read as the definitive statement for biodiversity protection for the site to which the *Statement of Commitments* can only attempt to summarise at best.

We also prepared an Ecological Site Management Plan (ESMP). This aims to identify the detail of 'how to manage' the site given the directions raised in the CLUMP.

Together, the CLUMP and the ESMP provide a formidable set of management planning tools that enable government authorities and future land owners to manage the landscape challenges of this site at Rosedale while providing protection and conservation to threatened species, significant species, endangered ecological communities and other less threatened wildlife.

Indeed the concept planning by Roberts Day illustrate a very clear message that biodiversity was the key to this project, with existing grazing paddocks turned into potential living spaces and returning native landscapes in both terrestrial and aquatic environments.

I believe that an aerial photograph showing the Rosedale Site with an overlay of the concept and the proposed conserved landscape may clarify matters further. We have now prepared this plan which is attached as Figure 6.

It is from this perspective that we, also in hindsight, believe that the Environmental Assessment volume (Kass – Hermes, 2007) including the CLUMP might have provided more explanation of the role of the CLUMP and the extent to which ecology was paramount in this projects direction.

Indeed the Environmental Assessment's role was to condense the myriad of reports and attachments (some 46 in all) provided with the application. It was not designed, in its own right, to be the principal conservation planning documentation. Clearly that is very well enunciated within the CLUMP and the ESMP.

For this reason I query whether the DECC response may have confined itself to the assessment documents only and not considered the management regime as controlled by the CLUMP and ESMP.

In addition to the above, we would like to provide a more specific response to the issues raised by DECC in their letter of the 8<sup>th</sup> January 2008 to DOP.

### No documented assessment of matters of national significance has been provided.

DECC is correct in pointing out that the Flora and Fauna Assessment did not fully consider the impact on the EPBC Scheduled species - Latham's Snipe, White Bellied Sea Eagle and White-throated Needletail.

The Latham's Snipe, White Bellied Sea Eagle and White-throated Needletail are, however, not listed as threatened species under the EPBC Act but rather are listed as migratory and marine species.

Migratory and marine listed species are matters of National Environmental Significance and the impact of the proposed action is required to be assessed in accordance with the EPBC Act Significant Impact Guidelines for NES matters.

In accordance with the requirements of Commonwealth EBPC legislation an assessment is required to be undertaken for 'actions' that have a <u>significant impact</u> on matters of national environmental significance (NES). These may include:

- Wetlands protected by international treaty (the Ramsar Convention)
- Nationally listed threatened species and ecological communities
- Nationally listed migratory species

By way of explanation 'actions' are projects, developments, undertakings, activities, series of activities or alteration of any of these. An action that needs Commonwealth approval then becomes a "controlled action" and this type of action requires a more detailed assessment to be considered by the Commonwealth when they determine if the proposed action would have a significant effect on a NES matter.

Where a proposed activity is located in an area identified to be of NES, or such that it is likely to significantly affect threatened species, ecological communities, migratory species or their habitats, the matter needs to be referred to *Department of Environment & Water Resources*.

The initial assessment by our fauna ecologists has assessed whether the proposed development and ecological restoration works would have a <u>significant</u> impact on Latham's Snipe, White Bellied Sea Eagle and White-throated Needletail. The assessment concluded that there was not possible for the development to have any significant impact upon those species.

Indeed no habitat is being removed that could possibly be considered to impact upon these species such that we concluded that all potential foraging and breeding habitat for these three species will be fully conserved as part of the restoration works.

Notwithstanding this opinion...

#### Assessment of NES Matters (EPBC Act)

Latham's Snipe & White Throated Needle-Tail are migratory species that breed outside of Australia and will forage or temporarily reside in appropriate habitat.

The White Throated Needle-tail spends most of its time flying foraging on the wind and will roost overnight on land. There is no breeding habitat onsite and it has a very extensive foraging habitat. There are no direct or indirect impacts as a result of the proposed action

that will impact on this species. It is considered that as there will not be a significant impact on the White Throated Needle-tail by either direct or indirect impacts and the proposed action does not need to be referred for assessment under the EPBC Act.

Latham's Snipe utilises areas such as the Bevian Wetland and other temporarily inundated areas for foraging and roosting, however, these areas have been conserved in most locations onsite and its foraging and roosting habitat will not be significantly affected. It is considered that as there will not be a significant impact on the Latham's Snipe by either direct or indirect impacts then the proposed action does not need to be referred for assessment under the EPBC Act.

White Bellied Sea Eagle has been observed in the local area. There is potential nesting and breeding habitat onsite associated with the Bevian Wetland, but we stress that no nests have been observed. The most likely breeding and roosting habitat onsite occurs in tall living trees adjacent to water bodies in which they forage such as Bevian Wetland. As the nests are very large and obvious under survey, and a complete search has been recently completed over the entire site (14 -18<sup>th</sup> January 2008), it is considered that no nests have been built in recent years. As the main foraging area is already being conserved within the Bevian Wetland and its surrounding buffer, it is considered that as there will not be a significant impact on the White Bellied Sea Eagle by either direct or indirect impacts and the proposed action does not need to be referred for assessment under the EPBC Act.

It is concluded that as all potential foraging and breeding habitat on this site is being conserved as part of the restoration works for all three species, the proposed development will not have any direct or indirect significant impact on Latham's Snipe, White Bellied Sea Eagle and White-throated Needletail and the conclusion that a referral under the EPBC Act will not be required remains the same.

Action: An addendum, if required, can be provided to the Flora and Fauna Report and Ecological Assessment Report.

The draft statement of commitments does not clearly stipulate the retention and protection of Endangered Ecological Communities and habitats of threatened hollow fauna.

The draft Statement of Commitments should have identified these as commitments; however they have been clearly detailed in the concept planning graphics as well as in the detail of the CLUMP and the ESMP.

In respect of these two issues raised we can attest that

- The Bevian Wetland will be fully protected from both direct and indirect impacts from upslope stormwater and other possible environmental impacts. We also understand that a report was submitted by Geoff Sainty who assisted the Department in respect of the aquatic environment assessment in the Bevian Wetland.
- Riparian restoration will be undertaken as displayed on Schedule 3 attached.
- The Knoll vegetation is being conserved see The Knoll Schedule 3.
- Connectivity is provided with adjacent vegetation and habitat resources see Schedule 3.

- Our fauna ecologist has recently completed a habitat tree surveys that has indicated the presence of 168 hollow bearing trees on the site the majority 80 % of which are located in the proposed conservation areas (**Table 1**).
- Of 33 Habitat Trees within the development footprint, only 2 are of medium or high value (**Figure 10**).
- Hollow bearing trees onsite are severely degraded and have been significantly impacted by clearing onsite (**Table 2** 94.5% reduction onsite compared with control sites).
- No threatened species has been observed within the high or medium value trees.
- No migratory species will be significantly affected.
- All endangered ecological communities will be maintained or expanded as a result of the proposed protection and restoration works.

We also note that there has been concern raised by the CMA in relation to the loss of native vegetation on the site and we believe that this is an ill conceived assessment and not reflective of an accurate assessment of vegetation retention and hollow bearing trees being retained onsite. Table 1 and 2 below provide an accurate census of the habitat trees onsite and those being impacted by the development footprint.

Notwithstanding the above we recognise that the draft statement of commitments may need expanding to fully explain and document the very clear intentions of retaining and protecting the endangered ecological communities (EEC) and habitats of threatened hollow fauna.

Action: Amend the draft Statement of Commitments to stipulate retention and protection of EEC's and hollow dependent fauna. The amended draft SOC will replace the existing document in Marsim's concept application.

#### Assessment of impacts on Hollow Dependent Fauna

The ecological assessment undertaken by *Conacher Travers Sept 2007* has already fully considered the impacts of the development on threatened flora and fauna by a comparison of the area of suitable habitat for endangered ecological communities and threatened flora and fauna species.

Given that the proposal seeks a concept application approval only, the full extent of tree removal cannot, and has not been assessed at this stage. The specific survey and assessment of hollows is considered a DA specific matter when development footprints have been defined. Despite this we have undertaken site survey over the last four days by three staff of *Travers Environmental*. As mentioned, this survey revealed the presence of approximately 168 hollow bearing trees on the site, the majority of which are located in the proposed conservation areas.

The habitat tree assessment audits the standing stock of hollows that are potentially used by fauna. The aim of the habitat tree assessment being to maximise the retention of hollow bearing trees, identify the hollow dimensions (5cm increments), and to identify the relative habitat value (class 1 – high value, class 2 – medium value or class 3 – low value) of these trees based on knowledge of recorded and potential threatened species (**Table 1 & 2**). The field survey method adopted is consistent with the biometric field methodology used by the PVP Developer (CMA Assessment method).

This data is consequently used to define building footprints with the aim of maximising the retention of the hollow bearing trees (**Figure 10**). This forces the lot and building layouts to respond to the presence of habitat trees. The end result is a development design that minimises the impacts on hollow dependent threatened fauna and to provide a standing stock of good quality and diverse hollow habitat.

As micro-chiropteran bats use a wide range of hollows, splits, bark fissures and dense vegetation for roosting, it is assumed that the needs of bats are addressed by retaining a wide range of trees and hollow bearing trees. However, microbat boxes will be installed in securely conserved areas to offset the potential losses of small hollows in the development area.

Normally we would recommend target surveys of habitat trees for breeding hollow dependent threatened fauna be undertaken prior to submission of a detailed DA at which time the detailed lot and infrastructure layouts are defined and surveys have been undertaken during the appropriate breeding season. Trees that contain breeding threatened fauna are retained as a high priority and may attract a buffer if appropriate to that threatened species e.g. Powerful Owl. However it is generally recognised by DECC that retention of hollows within high density developments is ecologically unsustainable in the long term.

Action: Undertake detailed field assessment during DA assessment ensuring offset at a ratio of 2 artificial boxes to 1 hollow removed (2:1).

#### Evidence of breeding Owls and Cockatoos

Targeted survey for breeding hollow dependent fauna will be undertaken in the appropriate season if the existing hollow bearing trees have the potential to house breeding fauna. Our fauna ecologists have made an expert judgement as to the likelihood of breeding fauna usage as per DECC guidelines.

Studies undertaken this week have allowed a more expert assessment of the likelihood of fauna being present. Notwithstanding these results, there will need to be increased surveillance of these hollows during breeding periods to complete the necessary ecological assessment.

However, the potential presence of threatened birds can be assessed based on assessment of the habitat tree attributes namely hollow size and quality. **Figure 10** presents the results of this assessment which has rated the habitat value of each habitat tree into low, medium and high. Based on hollow dimensions, Class 1 - high value and Class 2 - medium value trees provide suitable habitat for Owls and Cockatoos. With the exception of 2 habitat trees, figure 10 generally demonstrates the retention of these trees within riparian zones or conservation areas.

Action: Undertake target survey for breeding hollow dependent fauna for DA assessment during the appropriate breeding season.

#### Evidence of breeding Micro-chiropteran Bats

Stag watching of Habitat trees was selectively undertaken from 15<sup>th</sup> to 17<sup>th</sup> January 2008 to identify the presence of any potential roosting or breeding locations within habitat trees. Habitat trees that were considered by the fauna ecologist to have the most likely roosting habitat for micro-chiropteran bats were stag-watched and ultrasonic "Anabat" recordings were also undertaken. **Figure 10** identifies those habitat trees that were stag-watched and were considered to have the best roosting habitat. Whilst the Anabat recordings

demonstrated high levels of microbat activity, there was no evidence of roosting on the trees that were stag-watched.

The habitat tree analysis and the current findings of the stag-watching, logically indicate that whilst there is significant micro-chiropteran bat activity on site, it is likely the bat population is roosting in nearby vegetated areas but using the site as part of their extended foraging habitat.

Action: None

#### Assessment of trees at the Concept Stage

As the application is a <u>Concept Application</u> it is considered unnecessary to provide a high level of detail on tree removal and retention at such a broad level. Sufficient survey has been undertaken onsite to demonstrate the lack of impact on existing trees and that the proposed concept has generally retained the majority of existing trees.

Action: None required

#### Adequacy of Vegetation Offsets for Threatened Hollow-dependent Fauna

The *maintain or improve tests* for threatened hollow-dependent fauna is based on a breakdown of vegetation types that also reflect the general presence or absence of hollow bearing trees. During general fauna surveys, our fauna ecologists have also maintained an open eye for hollow bearing trees for the purposes of setting up trap lines, spot lighting runs and Anabat ultrasonic recordings.

Visual observations during survey have confirmed the potential for 'presence or absence' of threatened hollow dependent fauna within each vegetation type. Based on the hollow forming potential of tree species which takes into account the age of trees, formation and visible evidence of hollow formation, our ecologists are able to capably predict the likelihood of fauna usage.

Given that the majority of hollow bearing trees have been observed within vegetated areas that are to be retained (**Figure 10**), it is reasonable to conclude that vegetation type is a reasonable indicator of habitat resources. This is based on detailed site knowledge.

The following habitat tree data has recently been generated which demonstrates that the above assumption is reasonable. The data also demonstrates that hollow bearing habitat within the site is severely degraded. This outcome is based on a comparison on hollow densities within adjoining parcels of land (**Figure 10 – refer to control 20x50m quadrats**) that closely resemble natural conditions.

The average number of hollows per hectare within the control sites is 65 hollows per ha. The average number of hollows per hectare within the subject site is 3.6 hollows per ha. Consequently there has been 94.5 % reduction in hollow densities due to tree clearance within the subject site.

20 % of the hollows detected onsite (total of 55 out of 270 hollows found onsite) are within the development area. These 55 hollows are found within 33 trees within the development footprint. As the building envelopes are yet to be finalised the number of hollows impacted by the development can be further reduced.

**Table 1: Summary of Hollow Survey Data within Site** 

	Total No of Hollow Bearing Trees	Total No of Hollows & Splits	Total Small Hollows	Total Medium Hollows	Total Large Hollows	Total Splits	Class 1 Trees (High value)	Class 2 Trees (Medium Value)	Class 3 Trees (Low Value)	0-5cm Hollows/Splits	5-10cm Hollows/Splits	10-15cm Hollows/Splits	15-20cm Hollows/Splits	20-25cm Hollows/Splits	25-30cm Hollows/Splits	30cm+ Hollows/Splits
All of Site	168	270	163	67	10	30	12	8	148	21	163	48	19	9	0	10
Within Development	33	55	35	16	0	4	1	1	31	5	32	13	4	1	0	0
Within Conserved Areas	135	215	128	51	10	26	11	7	117	16	131	35	15	8	0	10

**Table 2: Natural Hollow Data within Control Sites** 

		AVG per			
	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	ha
No. Hollow Bearing Trees	3	2	3	2	32.5
No. of hollows	7	6	8	2	65
No. Small hollows	6	1	1	0	20
No. Medium hollows	1	5	4	1	31.25
No. Large hollows	0	0	3	1	13.75
Length of fallen trees/logs	32	19	53	91	830

Of the hollows found within the site only one Class 1 and one Class 2 tree are potentially impacted by the proposed development. With minor adjustments to the development design at the appropriate DA, both of these trees could be retained. The remaining 31 hollow bearing trees within the development footprint are of low value and, subject to targeted stag watching, are likely to be removed.

Action: Reconsider retention of hollows at DA 'design' stage in line with advice above.

#### Justification of the Artificial Nest Box Offset Ratio

The identification of an offset ratio for the replacement of lost hollows is currently a very inaccurate science and while various offset ratios have been generally proposed by experts ranging from 1 to 50 for every hollow removed, there is limited evidence that high replacement ratios provide any significant ecological benefit.

At present the aim is to achieve a 'maintain or improve' outcome compared with the current site condition and this can certainly be achieved by the adoption of a 2:1 offset ratio (2 nest boxes for every hollow removed) with an appropriate range of nest box size and types. Based on the hollow data above (potentially 55 hollows within the development footprint), this would equate to installation of a maximum of 110 artificial nest boxes.

In addition the natural occurrence of hollows in the local area has been assessed to provide an indication of natural hollow regeneration in restored areas which is typically far higher than can be achieved through artificial nest box installation. For this reason *Travers Environmental* has undertaken hollow assessment in 4 separate locations (control sites) in accordance with the CMA field assessment methodology in natural communities surrounding the Bevian Road site (**Figure 10**). The analysed results indicate an average natural hollow density of 65 hollows per hectare.

At an average of 65 hollows per hectare (derived from table 2), and based on 45 hectares of proposed restored forest it is expected that the restored areas will generate approximately 2600 hollows in the long term. Whilst this will occur gradually as the vegetation matures, the significance of the restoration works for this site's ecology including threatened species cannot be underestimated. An artificial nest box program in this context is insignificant in the long term.

Given that artificial nest boxes can be designed to have a 30 year lifespan with low levels of maintenance, the nest box program, as documented, will in our view provide a significant stop gap measure until further natural hollows start to develop.

Travers Environmental considers that the level of restoration works and the replacement of hollow habitat onsite, as recommended, will more than adequately compensate for impacts on endangered ecological communities and any potential threatened hollow dependent fauna.

Action: None at present. Further assessment to be undertaken at DA stage.

## The EA has not adequately addressed measures to be undertaken to conserve threatened fauna and their habitat.

As previously mentioned the Environmental Assessment's role is to condense the myriad of reports provided with the application. It was not to act as the entire set of 'conservancy' documentation. Clearly that was very well enunciated within the CLUMP, Ecological Assessment, ESMP and will later translate during the detailed DA phase into the final statement of commitments.

For this reason it appears to us that the DECC assessment contained itself to the Environmental Assessment volume only and for that reason we take the view that there is a lack of understanding regarding the ecological management process to be adopted onsite.

For clarity it is worth explaining that the proposed development will not remove any areas of vegetation which have connectivity to surrounding areas of native vegetation. At present, the majority of the vegetation within the site has been cleared for agricultural purposes. Isolated remnants occur along the eastern boundary, north-western and north-eastern corners of the site. All habitats in these areas have been almost wholly maintained.

More particularly the concept application has been designed to;

- To increase the connectivity within the site by linking these remnants through revegetation works along rehabilitated riparian zones and through areas of open space.
- Revegetation works, as documented in full, will create linkages from vegetation in the north western and north eastern corners of the site to the vegetation within the adjacent Mogo State Forest. The Mogo State Forest extends to the north and west of the site and encompasses an area of approximately 15,500 ha.
- Revegetation of the major riparian zone traversing the site in an east-west direction
  will, in our view, create connectivity from the remnants along the eastern boundary of
  the site to the western boundary of the site extending into Mogo State Forest
  (Schedule 3).

- Vegetation to the east of the site is partially fragmented and interrupted by both rural and urban development. For example the Tomakin sewerage treatment plant adjoins the south eastern boundary of the site.
- Habitat linkages have been planned to provide connectivity via habitat corridors, public parks and street trees.
- 80% of hollow bearing trees found onsite and significant foraging resources will be retained and restored within the post development landscape as part of the Conservation and Open Space Precincts within the site. These areas will create connectivity across the site to habitat within the adjacent Mogo State Forest. This connectivity will maintain the ecological functioning of the post development landscape.
- All habitat trees found onsite will be retained in order of priority in accordance with the quality, quantity and size of hollows found in each tree. Given that the current Concept plan is a 'concept only', specific survey and assessment on the impact on hollow trees will only need to be undertaken at the DA stage.
- Seasonal foraging resources within the site provide year round food sources for native fauna. The Spotted Gum/Ironbark Open Forest vegetation community provides an important winter foraging resource, while the Blackbutt Woodland vegetation community provides an important summer foraging resource.
- These foraging resources will be protected within the conservation zones throughout the site. In addition, all landscaping works will utilise locally occurring native species to further enhance foraging habitat.

Action: None. The ESMP ensures protection of these important ecological values.

## The EA has not adequately addressed measures to conserve endangered ecological communities.

The proposed measures to conserve endangered ecological communities are enunciated within the CLUMP and ESMP in detail. The EA encompasses these documents.

The proposal is to increase the total area of EEC's from 19.29 hectares to 22.83 ha.

In addition, the proposed native vegetation enhancement will provide linkages for the benefit of the site's EEC's and other terrestrial and or aquatic EEC's. The additional lands include an additional 23 hectares of restored Spotted Gum, Banksia Scrub and Blackbutt Forest.

In respect of the DECC *maintain and improve* requirements there is no requirement to provide a specified offset ratio as required under the *maintain & improve test* (DECC Draft Threatened Species Assessment Guidelines 2005).

Indeed the project has demonstrated that the development will have a significant net improvement for EEC's.

There is also no requirement to provide offset lands when there is no net loss of EEC's.

The Draft Threatened Species Assessment Guidelines (2005) for a part 3A project, Section 1.2, states:

The objective of the assessment process is to provide information to enable decision makers to ensure that developments deliver the following environmental outcomes.

- Maintain or improve biodiversity values (ie. there is no net impact on threatened species or native vegetation).
- Conserve biological diversity and promote ecologically sustainable development.
- Protect areas of high conservation value (including areas of critical habitat).
- 4. Prevent the extinction of threatened species.
- Protect the long-term viability of local populations of a species, population or ecological community
- 6. Protect aspects of the environment that are matters of national environmental significance.

The assessment is designed to provide information and analysis to demonstrate that feasible alternatives have been considered, that the project has been designed to be consistent with the principles outlined above, and where there are impacts, that adequate mitigation measures are implemented.

The assessment documentation has clearly met all the above objectives.

Notwithstanding the Maintain or Improve test being achieved, *Conacher Travers* Flora and Fauna Assessment report (2007) has provided statistical information on EEC restoration via the provision of a *ratio of restoration* (not including existing EEC's to be retained) versus the *removal of endangered ecological communities.* See Table 3 & 4 'EEC Maintain & Improve Assessment'; Section 6 Conclusions - within *Conacher Travers Flora and Fauna Report September 2007*; and Section 3.1.2.1 *Ecological Assessment Conacher Travers December 2007*.

Action: None

#### Impact of proposed landscape works within protected conservation areas.

DECC has raised the concern (verbal confirmation with Dimitri Young DECC 23.1.08) that formal planting and the proposed pathways in the Bevian Wetland Conservation Zone will negatively impact on the wetland and proposed regeneration works. More specifically DECC discussed the option of placing a footpath adjacent to Bevian Road along the western boundary of the Bevian Wetland as well as the exclusion of formal landscaped areas in the regeneration zone.

The alignment of the proposed boardwalk sensitively miandering through the EEC was considered the best ecological outcome in light of the existing EEC and the limited room for further road construction in particular to accommodate a formal pedestrian footpath on the eastern side. Construction of a boardwalk along the road was not preferred as there is limited space adjacent to the first 200m of access road. Installation of a 1.8 m pathway would result in the loss of significant Casuarina Trees that are part of the EEC which visually filter views of the main access drive from the eastern approach along George Bass Drive. The preferred alternative, a sensitively design boardwalk initially over the water, eg a floating boardwalk, would result in no soil disturbance or loss of significant vegetation. As the boardwalk approaches the Swamp Oak Forest, a raised boardwalk that weaves between the trees would not result in any tree removal. Consequently the boardwalk sensitively constructed in a low key manner along the western edge of the wetland would be able to be installed without the removal of canopy vegetation.

The Concept Landscape Plan also shows "mass planting" with the proposed restoration zones to the northern and eastern aspects of Bevian Wetland. These areas are in fact "Regeneration Zones" that will involve supplementary planting to ensure that the dominant species for the respective endangered ecological communities are rehabilitated onsite. The

"Mass Planting" will be relabelled on the Concept Landscape Plan as "Regeneration Zones with Supplementary Planting".

The Concept Landscape Plan also showed the installation of a new pathway along the current Bevian Road alignment on the northern edge of Bevian Wetland. The intention of the Landscape Plan was to provide a connected pathway/boardwalk that provided a relaxing and scenic walk through the conservation area where trees are already cleared. As the path would be slimmer than the existing road, it was envisaged that regeneration would occur along the boundaries.

An alternative has been proposed by DECC which will see the removal of this northern pathway, requiring the proposed board walk to rejoin the proposed main access road prior to crossing the northern aspects of the wetland. The proposed path from the community lands immediately to the north of Bevian Wetland leading to a viewing platform with views across Bevian Wetland will be retained. This proposal has been accepted and is supported ecologically as it allows the regeneration of the existing Bevian Road back to Swamp Oak Forest. This proposal will marginally increase the offset for the endangered ecological Community - Swamp Oak Forest on Coastal Floodplains.

The other area proposed for formal planting and a pathway is noted on the Landscape Plan on the eastern tongue of the wetland. This area is currently land cleared beneath a transmission line easement. It has been agreed that this will also be deleted from the Landscape Plan as discussed with Dimitri.

The concept Landscape Plan submitted with the Concept Application will therefore require further amendment to accurately reflect the conservation and restoration strategies raised by DECC. The landscape plan will be amended to reflect the regeneration of natural vegetation in the wetland conservation zone.

Action: Submit a revised Concept Landscape Plan in accordance with the above supported changes.

## Habitat Corridors are not provided for connectivity of Endangered Ecological Communities

Existing wildlife corridor values have been maintained onsite and are significantly enhanced by the proposed restoration works. Vegetation on private lands on the south west and south east boundaries currently provide partial connectivity for endangered ecological communities.

DECC has queried the need for connectivity to the west from the western tongue of SOFF associated with Bevian Wetland to Mogo State Forest. In addition DECC suggested that connectivity should also be established to the east through the restoration of existing cleared lands within the Rosedale STP Buffer Zone.

In preparing the design of the restoration areas, existing site constraints such as transmissions lines, waterlogged soils, existing regenerating vegetation and topography were considered to design the proposed restoration works.

#### Habitat Connectivity to the East

A 50 m corridor has been provided to the east along the southern boundary of the site. A vegetated riparian corridor varying between 30-110m of mainly SOFF, also exists on the

Rosedale STP site on the same boundary. The total habitat corridor width as proposed including vegetation on STP lands will vary between 80 to 160 m in width.

Given the existing level of connectivity onsite to the east, *Travers Environmental* consider it unnecessary to re-establish further connectivity to the east. However the Concept Landscape Plan shows significant revegetation works on the south eastern boundaries which should be retained to enhance connectivity on the eastern boundary.

#### Habitat Connectivity to the West

It appears that DECC may have assumed that Mogo State Forest extends the full length of the western boundary of the site. Mogo State Forest in fact stops immediately adjacent to the proposed Ecological Corridor passing through The Knoll. In addition an existing high voltage transmission line exists on the south western boundary on adjacent lands which are kept cleared for maintenance of vegetation under the transmission line (**Constraints Map – Bevian Road Concept Application & Figure 10**). With this existing infrastructure in place it will not be possible to establish vegetation connectivity from the SOFF across the transmission line easement and adjoining lands into the Mogo Forest.

Given the presence of this transmission line, the lack of security in protecting vegetation on private lands, *Travers Environmental* consider it unnecessary to establish further connectivity to the west. The current proposed Ecological Corridor through the Knoll provides direct habitat connectivity to Mogo State Forest.

Action: None required.

I hope the above advice provides substantial assistance in your deliberations, given the urgency of this matter and the tightness of the time frames; I look forward to be in a position to discuss these matters as soon as possible.

In the mean time if you have any queries, please do not hesitate to contact John Travers on 4340 5331 or ecology@traversenvironmental.com.au

Yours faithfully,

John Travers

Director

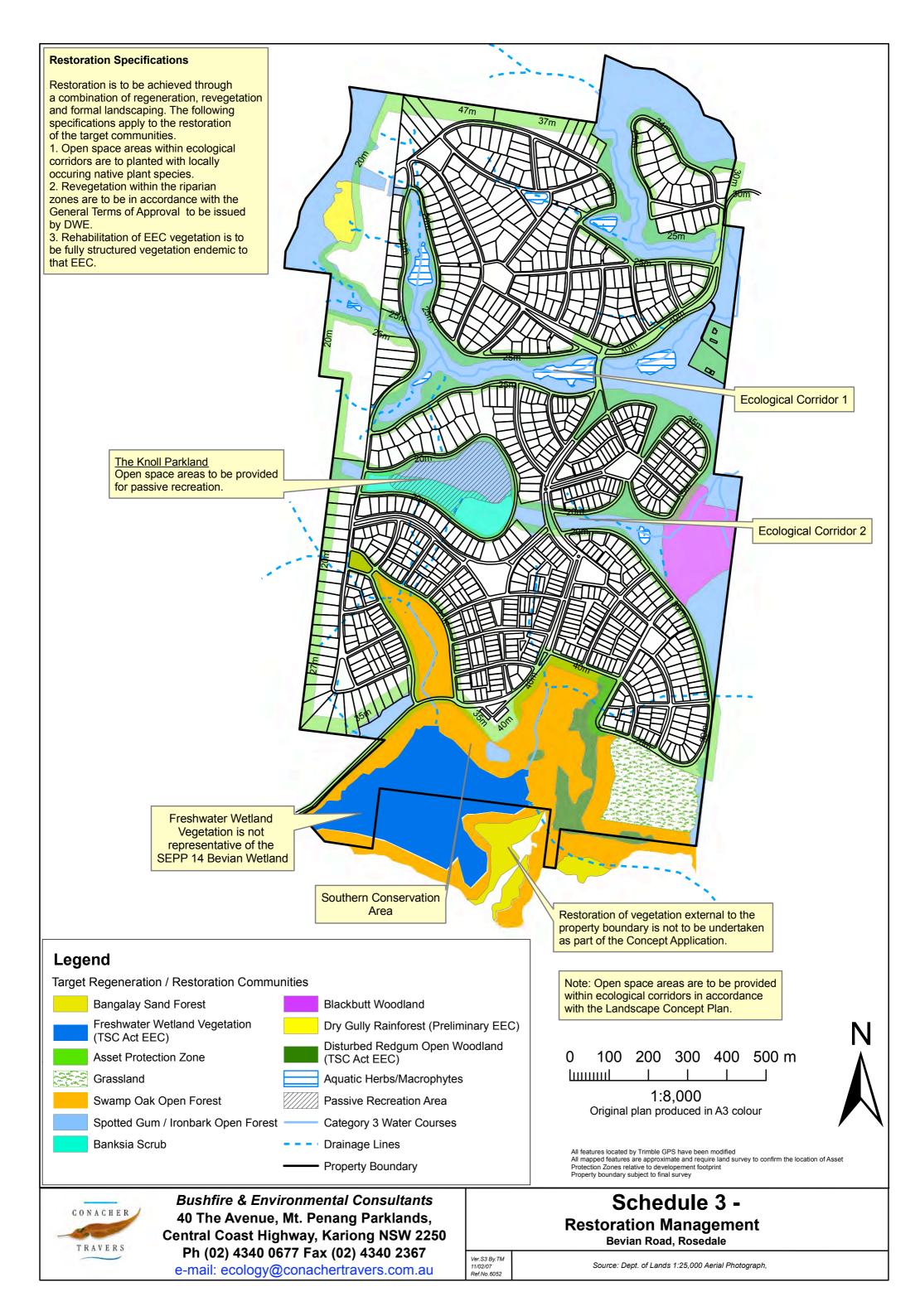
Travers environmental

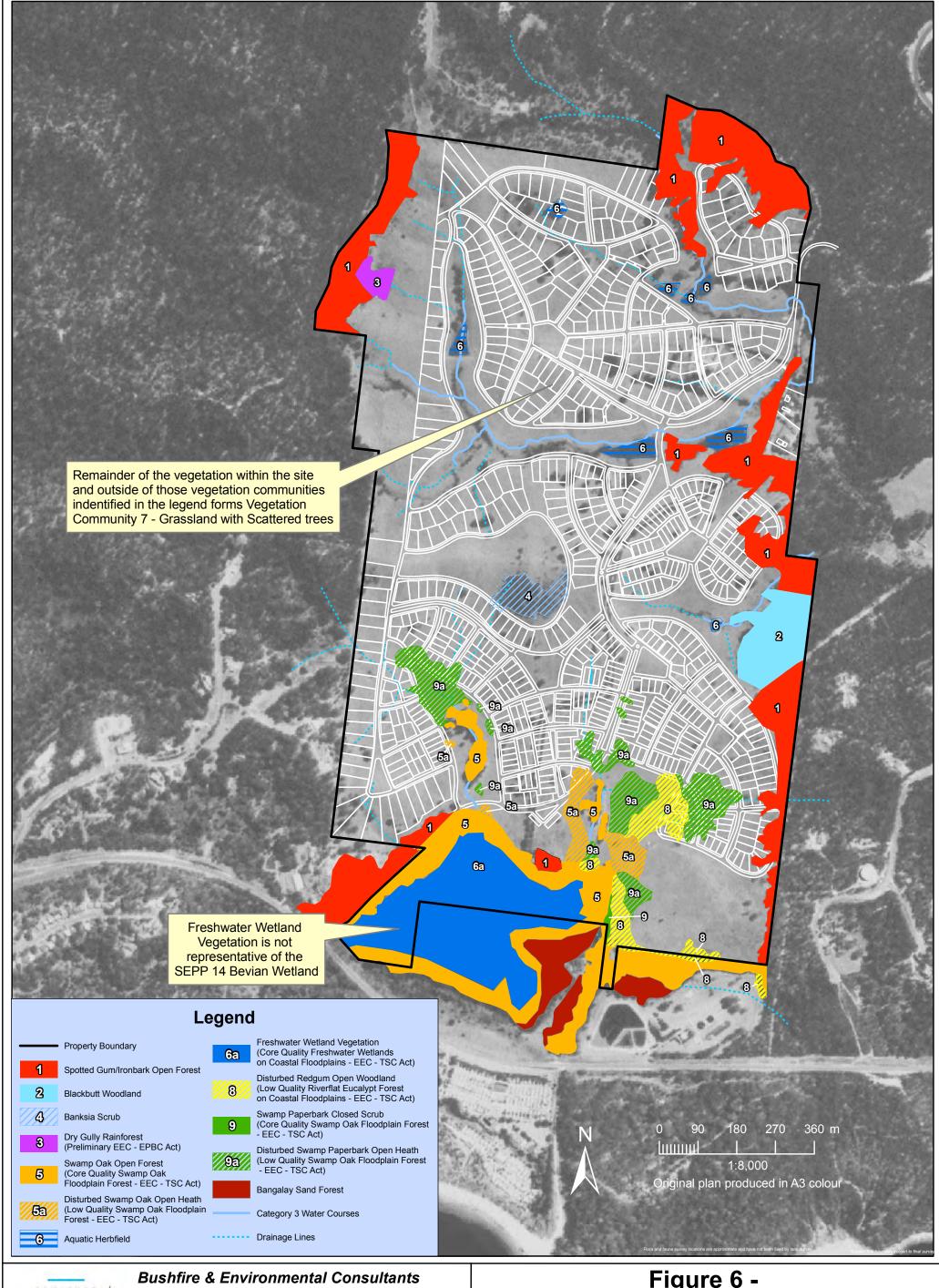
Attachments:

Figure 6
Figure 10
Schedule 3

Amended Landscape plan

**Note -** Travers environmental has taken over the respective business of Conacher Travers Pty Ltd – effective November 2007.







Bushfire & Environmental Consultants 40 The Avenue, Mt. Penang Parklands, Central Coast Highway, Kariong NSW 2250 Ph (02) 4340 0677 Fax (02) 4340 2367

e-mail: ecology@conachertravers.com.au

# Figure 6 - Vegetation Communites

Bevian Road, Rosedale

Ver.F6 By.TM 17/10/07 Ref.No.6052

Source: Dept. of Lands 1:25,000 Aerial Photograph,



100 200 300 400 500 Metres

1:8,000

Original plan produced in A3 colour

## Legend

**Habitat Tree Classification** 

Property Boundary

Class 1 (High Value)

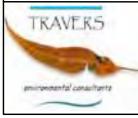
Stag Watch Locations

Class 2 (Medium Value)



Control Quadrat Locations (50x20m)

Class 3 (Low Value)



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### Figure 10 -**Hollow Bearing Tree Survey**

Bevian Road, Rosedale

Ver.F10 21/01/08 Ref.No.6052

Source: DLWC 1:25,000 Aerial Photograph,



BEVIAN ROAD - CONCEPT APPLICATION

LANDSCAPE CONCEPT PLAN

Drawing: CA-005 | Issued for: Approval | Dated: 23.11.2007 | Drawing Issued for Approval





