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***Coffs Harbour Highway Planning  
Coffs Harbour Section***

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***Ecological Assessment  
Working Paper No 5***

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## ***Executive Summary***

The examination of potential impacts associated with the Inner Bypass Options and the Existing Highway Option consistently indicate that the Inner Bypass Options are more likely to have a higher impact on threatened species and vegetation of conservation significance than that of the Existing Highway Option. The Inner Bypass Options generally pass through more developed land and require more clearing than the existing Highway Option. The existing Highway Option requires less clearing and, where clearing is required, these habitats are likely to be degraded by edge effects and other disturbances associated with the existing roadway.

The likely impacts associated with each Inner Bypass Option were generally similar in terms of vegetation clearance, aquatic habitats, the tree hollow resource and winter flowering trees. However, the likely impacts associated with Options IS2 / IN1 and IS2 / IN2 were lesser than Options IS1 / IN1 and IS1 / IN2 in regard to Koala Habitat and Wildlife Linkages.

Despite the differences in potential impacts, both the Inner Bypass Options and Existing Highway Option would require the provision of fauna underpasses and / or overpasses due to the presence of wildlife linkages, which include a number of Koala movement corridors. However, in the case of an Existing Highway Option these would provide some improvement over the existing situation as they could potentially improve linkages already impacted by the existing highway corridor.

# 1. Introduction

## 1.1 Background to the Proposal

The Coffs Harbour Highway Planning Strategy is being developed with the objective of addressing the need to upgrade the Highway between Sapphire and Woolgoolga, while planning for the future traffic needs within the Coffs Harbour urban area.

The Strategy was publicly launched in September 2001 and, in March 2002, an information sheet containing the following key announcements was released:

- identification of four initial corridor options for the northern section of the strategy area from Sapphire to Woolgoolga
- a decision that the inner corridor in the southern section of the strategy area between Sawtell and Sapphire / Moonee was the only potentially feasible bypass option suitable for further consideration
- commencement of a detailed comparison of upgrading the existing highway in the southern section of the strategy area as an alternative to an inner corridor bypass

A community update released in December 2002 described five route options for the Sapphire to Woolgoolga upgrade.

The Roads and Traffic Authority (RTA) has also undertaken a comprehensive review of the community generated Coastal Ridge Way proposal. A review of this proposal is reported separately in the Coastal Ridge Way Review Report (Connell Wagner, 2004a).

As part of the investigations in the southern Coffs Harbour section, two route options have been identified in the inner corridor. A range of studies has been undertaken to determine the performance of the inner route options in comparison with the Upgrading of the Existing Highway option. This study has been compiled in order to investigate and assess the ecological effects of the route options.

## 1.2 Study Area

The study area is located in the Coffs Harbour local government area (LGA), in the NSW North Coast Bioregion. This Bioregion is part of the Macleay – McPherson overlap zone, that covers an area from the Barrington Tops in NSW to Lamington National Park in South East Queensland. This zone is characterised by an overlap in distribution of tropical species from the north east and temperate species from the south east areas of the eastern seaboard. The environmental characteristics allied with this overlap are associated with a highly diverse array of species (NSW Department of Environment and Conservation, previously the National Parks and Wildlife Service (NPWS) 1994). The forests of the NSW North Coast Bioregion (the 'north eastern forests') are one of Australia's most diverse ecosystems (NPWS 1994).

There are a number of examples of biological diversity within the NSW North Coast Bioregion. This region supports over 400 species of forest vertebrates (NPWS 1994, Huggett 2002, 2000). Of the forest vertebrates, macropod communities in the region are among the most diverse on the east coast of Australia, with areas north of 33°S (such as the study area) supporting seven species, increasing to nine approaching the New South Wales - Queensland border (Southwell *et al.* 1999). The NSW North Coast Bioregion also contains Australia's second highest diversity of birds, containing approximately 181 species (Gilmore and Parnaby 1994).

The NSW North Coast Bioregion also supports several endemic species including those at or approaching their distributional limits, and over 70 threatened species (Gilmore and Parnaby 1994, SFNSW 1995). The forests of this region enable the continued existence of many of these fauna species, by providing breeding and foraging habitats and regional movement corridors.

NPWS (1999) identified the NSW North Coast Bioregion as containing one of the two major peaks of eucalypt diversity in Australia. In addition to this, four of the five major rainforest groups all have significant occurrences in the region (Floyd 1990). The Comprehensive Regional Assessment (CRA) of the NSW North Coast Bioregion identified 157 forest ecosystems of which 137 are eucalypt dominated. Of these ecosystems, 31 meet the Joint ANZECC / MCFFA National Forest Policy Statement Implementation Subcommittee (JANIS) criteria for rarity and a further 19 meet the JANIS criteria for vulnerability.

JANIS (1997) was developed as part of the NSW Comprehensive Regional Assessment (CRA) and Regional Forest Agreement (RFA) process, to provide scientific information needed to develop a comprehensive, adequate and representative (CAR) forest reserve system. To achieve this, JANIS (1997) provides criteria for the recognition of rare, endangered and vulnerable ecosystems in addition to specifying minimum benchmarks for the proportion of each forest ecosystem, which should be protected in the CAR (Comprehensive and Regional) reserve system. The establishment of a CAR is an agreed outcome of RFA and a commitment of the National Forest Policy Statement (Commonwealth of Australia 1992).

From a biogeographic context, all of the catchments in the study area are located within the south-east Coast drainage Division (*sensu* Lake [1978]). Following the classification of NSW wetlands by Pressey and Harris (1988), the waterways crossed by the options (except for estuarine environments) are classed as 'lotic wetlands of the tablelands'.

The dominant vegetation types of the study area are, broadly speaking, eucalypt forests. Within the Coffs Harbour LGA, these forests constitute approximately 49% of remaining native vegetation, the majority of which occurs in State Forests (Coffs Harbour City Council 1998). In a study of the forests in the Coffs Harbour LGA, Fisher *et al.* (1996) identified thirty-one vegetation communities. These communities are part of broader complexes of vegetation that are rainforest, riparian vegetation, tall open forest, open forest, swamp forest, foredune complex, heath and scrubland, sedge/rush complex, headland heath and grassland and mangrove/saltmarsh complexes. Fisher *et al.* (1996) found that approximately 94% of the remaining vegetation in the Coffs Harbour LGA has some degree of conservation significance, for example regional or local significance, or an association with threatened species (*Threatened Species Conservation Act (TSC) Act 1995*) or rare or threatened Australian plant (ROTAP) species.

A Nature Reserve and National Park are located in the study area. These areas have been reserved under the *National Parks and Wildlife Act 1974* as they contain elements of conservation significance, such as threatened species or vegetation of local or regional significance. Korora Nature Reserve, located to the north of the study area adjacent to the Pacific Highway (Figure 1) provides a small representation of the range of the ecosystems associated with wet sclerophyll forests of the North Coast. The reserve was previously used for Koala regeneration and the establishment of colonies of Red-legged and Red-necked Pademelons (Coffs Harbour City Council 1998). Ulidarra National Park provides habitat for a diverse range of fauna, including Koalas, the Powerful and Masked Owls, Rose-crowned and Superb Fruit Doves, Wompoo Pigeon Little Bent-wing Bats and Giant Barred Frog.

In addition to conservation reserves administered by the NSW Department of Environment and Conservation (DEC), State Forests of NSW (SFNSW) administer Bruxner Park Flora Reserve to the north west of the study area. The nearby State Forests also contain other areas that are managed for the protection of natural and cultural conservation values (informal reserves) and areas managed for conservation of identified values and forest ecosystems and their natural processes (areas subject to special prescriptions).

### **1.3 Description of Options**

#### **1.3.1 Inner Corridor Bypass Options**

Two feasible route options have been identified in the inner corridor as potential bypass routes for the Pacific Highway. Each is between 11.0 and 11.4km long with a common 'cross-over point' at 4.5km in the vicinity of Coramba Road, near its intersection with Bennetts Road. The north and south sections of the



COFFS HARBOUR HIGHWAY PLANNING  
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ECOLOGICAL ISSUES



**FIGURE 1**  
**STUDY AREA**

options are interchangeable and combine to form four variants of the two main alignments. These are illustrated in Figure 1 and described as follows:

- **Inner South 1 (IS1):** This option deviates from the existing highway south of the Englands Road roundabout, aligning to the east of the CHCC waste depot and to the west of Isles Industrial Park. This route crosses North Boambee Road approximately 300m west of Bishop Druitt College and continues north toward the southern ridgeline of the Coffs Harbour basin, crossing at the lowest saddle in the ridgeline approximately 100m west of Buchanans Road before proceeding north-west to Coramba Road, crossing at the Bennetts Road intersection.
- **Inner South 2 (IS2):** This alignment is initially the same as Inner South 1 but deviates from that route south of North Boambee Road and tracks further to the west, passing the southern Coffs Harbour ridgeline at a much higher point about 800m west of the other alignment. This ridge crossing would likely necessitate a 560m long tunnel to avoid a cutting in excess of 100m deep.
- **Inner North 1 (IN1):** From Coramba Road this alignment veers north-east, crossing Spagnolos Road and Shephards Lane before turning easterly, in close and parallel to the railway line for about 1.6km up to Mackays Road. From this point it deviates from the railway line to pass through another main ridgeline near the western end of Gatelys Road. Further north the alignment skirts the West Korora basin crossing Bruxner Park Road before rejoining the existing highway at Korora Hill.
- **Inner North 2 (IN2):** This alternative alignment features a more westerly sweep of the Coffs Harbour basin, providing maximum separation between the alignment and existing residential areas. It crosses Shephards Lane at its western extremity passing over the railway east of the railway tunnel under Shephards Lane. The route passes through and then behind a major ridgeline near the end of Shephards Lane and traverses a relatively isolated valley, well shielded from the majority of residential areas. It then passes through the same ridge line as Inner North 1 near the western end of Gatelys Road and from that point the two northern alternatives are the same on the curved approach to the existing highway.

With both of the northern options, tunnels could be used to eliminate potential 60m deep cuttings, one on Inner North 1 and two on Inner North 2

### **1.3.2 Existing Highway Option**

In this report, the Coffs Harbour bypass options are collectively referred to as 'the Options', with the area of highway considered as part of this study referred to as the 'Existing Highway Option'.

## **1.4 Authority consultation**

Relevant authorities were contacted in June 2002 to identify issues for consideration in this assessment. Copies of this correspondence are contained in Appendix A.

### **1.4.1 NSW Department of Environment and Conservation (DEC)**

DEC (June 2002) has provided a list of items to be addressed in the preparation of an environmental impact assessment report. This list included various items from reference materials, a list of sensitive species and the preferred format of information.

### **1.4.2 NSW Fisheries**

NSW Fisheries has provided a number of considerations for the preparation of an Environmental Impact Statement (EIS). Considerations include the assessment of existing fish communities and aquatic habitats in relation to NSW Fisheries Policy (NSW Fisheries 1999), threatened species (according to the *Fisheries Management Act 1994*), licenses and permits and road design, rehabilitation and water quality considerations.



### **1.4.3 Environment Australia**

Under the Environment Protection and Biodiversity Conservation Act (2000), actions that are likely to have a significant impact on a matter of national environmental significance are referred to Environment Australia for approval. When a preferred Option has been chosen, Environment Australia will be contacted to determine if the proposal is likely to significantly impact on a matter of national environmental significance.

Relevant species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), as identified from a search of Environment Australia's Online Database, and Environment Australia's Assessment Guidelines have been incorporated into this study, where appropriate.

## **1.5 Objectives**

The comparison of corridor options is intended to provide input to a decision on the preferred highway corridor by allowing full and detailed consideration of the operational characteristics and costs of each option, as well as potential social, environmental and property impacts and available mitigation measures to off-set these impacts.

The purpose of this assessment is to compare the inner bypass and the upgrade of the existing highway in terms of the relative ecological impacts of the Options. When assessing impacts, the full length of each of the indicative inner bypass alignments and the existing highway option have been assessed.

The RTA's 'Compensatory Habitat and Guidelines – Draft 7' (Roads and Traffic Authority, 2001), provides a process for determining the most appropriate method to ameliorate impacts on flora and fauna and their habitats as a result of road development. The Guidelines state that "In principle, the planning and construction of roads should, in order of consideration, endeavour to:

1. **avoid** impacts on habitat, through the planning process;
2. **minimise** impacts on habitat, through the planning process; and
3. **mitigate** impacts on habitat, through the use of a range of amelioration measures.

The first two principles of **avoid** and **minimise** are especially relevant to this study as they relate to the location of a road – or in this case, identifying a preferred option. Examination of these principles is briefly described below:

1. **Avoid** impacts on habitat, through the planning process: avoiding impacts on habitat is the best way to maintain biodiversity, and can be achieved through the planning and route selection process; and
2. **Minimise** impacts on habitat, through the planning process: minimising impacts will limit habitat loss where possible through the planning and route selection process.

Consideration of the *Avoid and Minimise* principles has been embraced as part of the progressive development of bypass corridors since the initial strategy investigations. This was evident in the previous assessment of the original Inner, Central and Outer corridors, which revealed significant differences between those options (refer Connell Wagner, 2004b, Working Paper No 1: Statutory and Strategic Planning Issues). The subsequent development of indicative bypass routes in the inner corridor has further sought to avoid areas of habitat value where possible, or to minimise unavoidable habitat impact. An example is the allowance for a 'cut and cover' tunnel or vegetated fauna overpass at Roberts Hill ridge for Inner South 1, to retain the koala corridor in that area. It is noted that in some instances, the development of the indicative alignments was also influenced by other perceived critical route selection factors such as avoiding and minimising impact on urban development precincts. As an example, the avoidance of Bishop Druitt School in North Boambee was regarded as an essential requirement in alignment planning in that area.

The relevance of ecological constraints on the existing highway corridor was recognised as being significantly lower than is the case for any bypass corridor. As such, there were no major influences in the development of the ultimate upgrade scenario.

Once a preferred option has been selected, impacts that cannot be addressed by adopting the Avoid or Minimise principles are dealt with by the use of amelioration measures **to mitigate** impacts on habitat. The mitigation measures are addressed in detail during later environmental assessment studies, usually in the form of an EIS and/or a SIS (Roads and Traffic Authority, 2001). Such measures may include:

- Reducing construction zones;
- Underpasses and overpasses;
- Exclusion fencing;
- Landscaping and revegetation;
- Site rehabilitation;
- Compensatory habitat; and
- Traffic control and driver education (measures to reduce risk of road kill).

Although it is not possible to address the mitigation measures in detail at a strategic stage, typical measures would be integrated into any proposal in order to minimise ecological impact, regardless of which route option is adopted.