

**UPGRADING THE PACIFIC HIGHWAY**

**Woolgoolga to Ballina Upgrade**

**Working paper: Land use and property**

**November 2012**

**Final**



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# Executive summary

## Introduction

NSW Roads and Maritime Services (RMS) is seeking project approval for the Pacific Highway Woolgoolga to Ballina upgrade. The project involves upgrading around 155 kilometres of the Pacific Highway on the mid north and far north coasts of NSW, between about five kilometres north of Woolgoolga and six kilometres south of Ballina.

This working paper provides an assessment of land use and property affected by the project. It has been carried out to address the Director-General's environmental assessment requirements including:

- Impacts on directly affected properties and land uses, including impacts related to access, land use, property infrastructure, future development potential, property acquisition and land sterilisation and severance
- The agricultural sector taking into account fragmentation and potential loss of regionally significant farmland as identified in the Northern Rivers Farmland Protection Project (Department of Planning 2005) and Mid North Coast Farmland Mapping Project (Department of Planning 2008), food production, stock/ agricultural diseases and the impact on quarantined properties of a revised road network, and impacts on travelling stock routes/ reserves (as relevant)
- The operation of State forest, including potential for fragmentation and sterilisation of resources, and access by forestry and other users
- Impacts on Crown land, reserves and assets, and land reserved under the *National Parks and Wildlife Act 1974*
- Impacts on natural resources, including mining, petroleum production and extractive resources utilisation
- Impacts on commercial fishing access and aquaculture operations, including impacts on oyster priority areas in accordance with the NSW Oyster Industry Sustainable Aquaculture Strategy 2006 (Department of Primary Industries)
- Identification of services and utilities to be relocated.

The project is generally around 100 to 150 metres wide with interchanges and areas of large cutting and earth embankments typically being wider (up to 200 metres). The study area for this land use and property assessment includes that area within the operational and construction footprints of the project.

This assessment also considers broader potential impacts of the project on regional land use and property, including within the local government areas of Coffs Harbour, Clarence Valley, Richmond Valley and Ballina and the wider NSW North Coast and Mid North Coast regions.

## Existing environment

The existing land use and property context of the study area is characterised by:

- Agricultural uses, including cropping land used for sugar cane mainly in the northern part of the Clarence Valley local government area, north of Tucabia, and within the Richmond Valley local government area. Grazing land is mainly located in the southern part of the Clarence Valley local government area surrounding Grafton, although areas of grazing land are also scattered near the project in the Richmond Valley and Ballina local government areas. Horticultural land, including tree fruits, banana plantations, vegetables, vine fruits and nuts are mainly located in the Coffs Harbour local government area, west of Corindi and near Alstonville in the Ballina local government area
- Urban uses such as commercial, residential and industrial land uses mainly focussed on major regional centres such as Coffs Harbour, Grafton, Lismore and Ballina as well as towns and villages such as Tucabia, Maclean, Townsend, Harwood, New Italy, Trustums Hill, Woodburn, Broadwater, and Wardell. Pockets of rural residential land are also located across the study area, including near Section 3 – Glenugie upgrade to Tyndale of the project. Areas identified for future development include Clarenza, Junction Hill, West Yamba and Gulmarrad. Combined, these four major urban land release areas are expected to provide an additional 3,000 residential lots
- Commercial fishing and aquaculture operations are generally focussed on the Clarence River. Other operations are also located at the mouth of the Richmond River near Ballina
- Large areas of the study area comprise conservation land uses, including national parks and nature reserves, State conservation areas, flora reserves in the Forests NSW estate, wetlands, and tree and shrub cover. National parks and nature reserves within or near the project include the Yuraygir State Conservation Area and National Park, Yaegl Nature Reserve, Mororo Creek Nature Reserve, Bundjalung National Park and State Conservation Area, Tabbimoble Swamp Nature Reserve, Broadwater National Park, Uralba Nature Reserve and Wells Crossing Flora Reserve
- Areas of natural resource use, including State forests, mining and petroleum exploration and production, including coal seam gas exploration, and extractive industries such as quarries. The State forests are production forests that are managed for timber harvesting and occasionally leased for grazing. The quarries comprise a range of materials including sandstone, ironstone, chert, sand, basalt and argillite
- Areas of crown land, including reserves, waterways and public roads
- A range of major infrastructure and utilities, including road corridors, low and high voltage electricity transmission networks, telecommunications networks, and sewer and water supplies managed by local Councils.



## Potential impacts

Overall, the project would support future development both locally and regionally, through improved access across the region, to major regional centres such as Coffs Harbour and Ballina and areas outside of the region such as south east Queensland.

The construction and operation of the project would have a range of impacts, both positive and adverse, for local and regional land use and property as follows:

- **Property acquisition:** around 564 properties would be directly affected by the project, either wholly or in part, comprising about 1,700 hectares of land. This would affect around 381 landowners. For those properties where strip acquisition is required, a remnant land use strategy would be applied to parcels of surplus land left over following construction. As of September 2012, about 64 per cent of land acquisitions had commenced. However, negotiations between RMS and property owners are on-going as part of the property acquisition program.
- **Land use impacts:** direct impacts on land use would be mainly associated with land acquisition to create the project. The majority of land to be acquired is currently used for agricultural purposes. Potential land use impacts of the project on directly affected property include:
  - Change in land use to transport infrastructure, for land within the project.
  - Change in access to properties, due to restrictions on direct property access from the highway and location of the project
  - Potential severance and fragmentation of larger properties due to the location of the project
  - Impacts on the current use and future development potential of partially acquired properties
  - Impact on property infrastructure and structures, including farm sheds, fencing, and dams and other water infrastructure
  - Temporary disruption to the use of land impacted by construction activities.
- **Agricultural land:** the project would require the whole or partial acquisition of agricultural land, including land used for grazing, cropping and horticulture. This would directly impact around 1164 hectares of agricultural land over about 290 agricultural properties. This includes about 386 hectares of agricultural land classified as regionally significant farmland. While the loss of agricultural land and agricultural properties is significant for individual farmers directly impacted and local farming communities, regionally, the amount of agricultural land acquired for the project, including regionally significant farmland is considered relatively minor, comprising approximately 0.2 per cent of total agricultural land in the region
- **Future development areas:** There are no urban release areas identified for future residential or employment land directly impacted by the project. However, the project would support future development across the region, including at Townsend, Gulmarrad

and James Creek near Maclean, through improved access to major regional centres such as Coffs Harbour and Ballina and areas outside of the region such as south east Queensland. Furthermore, the project would support the development of new employment land at Glenugie and Pillar Valley. This growth area seeks to maximise the development potential of the area, based on the site's proximity to Grafton airport and the Pacific Highway. This potential development area is adjacent to the proposed interchange at Eight Mile Lane (Glenugie), and could be developed subject to a potential rezoning of this land by Clarence Valley Council

- Conservation land uses: The project has been located to minimise direct impact on conservation land uses where possible. However, some land identified as national park, nature reserve or flora reserve is directly impacted by the project. Land currently reserved under the *National Parks and Wildlife Act 1974* that would form part of the future road reserve is currently being revoked as land reserved under this act
- Extractive industries: potential impacts on quarry operations from the construction and operation of the project include direct impacts, associated with the acquisition of quarries located near the project and indirect impacts, associated with potential restrictions of quarry operations from proximity of the project to the quarry or changes to access. There are seven properties available or used for quarry uses located within the project that would be partially or wholly acquired near Tucabia, Broadwater and Bagotville. It is anticipated that sand and stone from these quarries could be used in construction of the upgrade. In addition, there are three properties comprising quarrying uses located within about one kilometre of the project. Consultation with land owners would be required to manage land use issues in locations where the realigned highway severs or moves closer to operational quarries. In particular, the detailed design of the project would need to consider quarry operating conditions including blasting and extraction limits. To minimise imported materials, fill would also be obtained from cuttings within the project boundary at Lang Hill (Section 8) and west of Wardell Road (Section 10).
- Mining and petroleum production: the project traverses land subject to existing mining and petroleum exploration licences, across the Clarence-Moreton Basin, including petroleum exploration licences relating to coal seam gas. There is currently no activity associated with petroleum production near the project and no major applications for petroleum production have been received by the Department of Primary Industries for land near the project. However, exploration for coal seam gas is occurring in the region to determine the commercial potential for development of coal seam gas production
- State forests: potential project impacts on land used for State forest include direct impacts associated with loss of State forest within the project and indirect impacts, such as changes in access. The project would directly impact six State forest areas along the length of the project. This would require the acquisition of about 204 hectares of State forest land. For most State forests, the area of land impacted is situated adjacent to the existing Pacific Highway and would occur from the widening of the highway. The acquisition of State forests would be undertaken in accordance with the *Forestry Act 1916*

- **Infrastructure and utilities:** the project would impact on infrastructure and utilities across the study area, including electricity transmission, telecommunications, water supply and sewerage infrastructure. This would require utility adjustments to existing services, relocation of some services where they cross the highway or the implementation of protection measures. The project traverses the catchment for the Rous Water borefield at Woodburn. Impacts on the borefield from the project's construction and operation are not expected to be significant and would be mitigated through the implementation of storm water management measures. Land required for the Broadwater Sewerage Scheme rising pump station would be affected by the project. The location of this main would be considered during the detailed design of the project in terms of the project's horizontal alignment. Alternatively, a utility adjustment would be considered, as appropriate. Consultation with Richmond Valley Council would be required regarding the timing of construction of both the rising main and the project.

### **Mitigation and management measures**

Where possible, impacts on land use and property have been either avoided or minimised through refinements to the project design or through the property acquisition and compensation process. A remnant land use strategy has been developed to manage the impacts on property and land use from the acquisition of land for the project.

RMS is continuing to consult with property owners directly affected by the project to resolve land use and property issues and achieve acceptable outcomes for individual property owners.

# 1. Introduction

This working paper provides an assessment of the potential impacts on land use and property impacts associated with the proposed upgrade of the Pacific Highway between Woolgoolga and Ballina. It includes an assessment of potential impact on property and existing and future land uses from the construction and operation of the project and identifies mitigation measures to avoid, minimise or manage impacts of the project on land use and property.

The working paper has been prepared to inform the environmental impact statement (EIS), which accompanies the project approval application for the project.

## 1.1. The project

NSW Roads and Maritime Services (RMS) is seeking project approval for the Woolgoolga to Ballina Pacific Highway upgrade project (the project) which is located on the NSW North Coast. The approval is sought under Part 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The project would upgrade around 155 kilometres of highway, forming a major part of the overall Pacific Highway Upgrade Program. The project would provide a four-lane divided carriageway from around five kilometres north of Woolgoolga to around six kilometres south of Ballina. Figure 1-1 shows the regional location of the project.

The project has been divided into eleven sections between tie-ins with the existing Pacific Highway to aid description, and the impact assessment for the project is described for each of these sections (refer to Table 1-1).

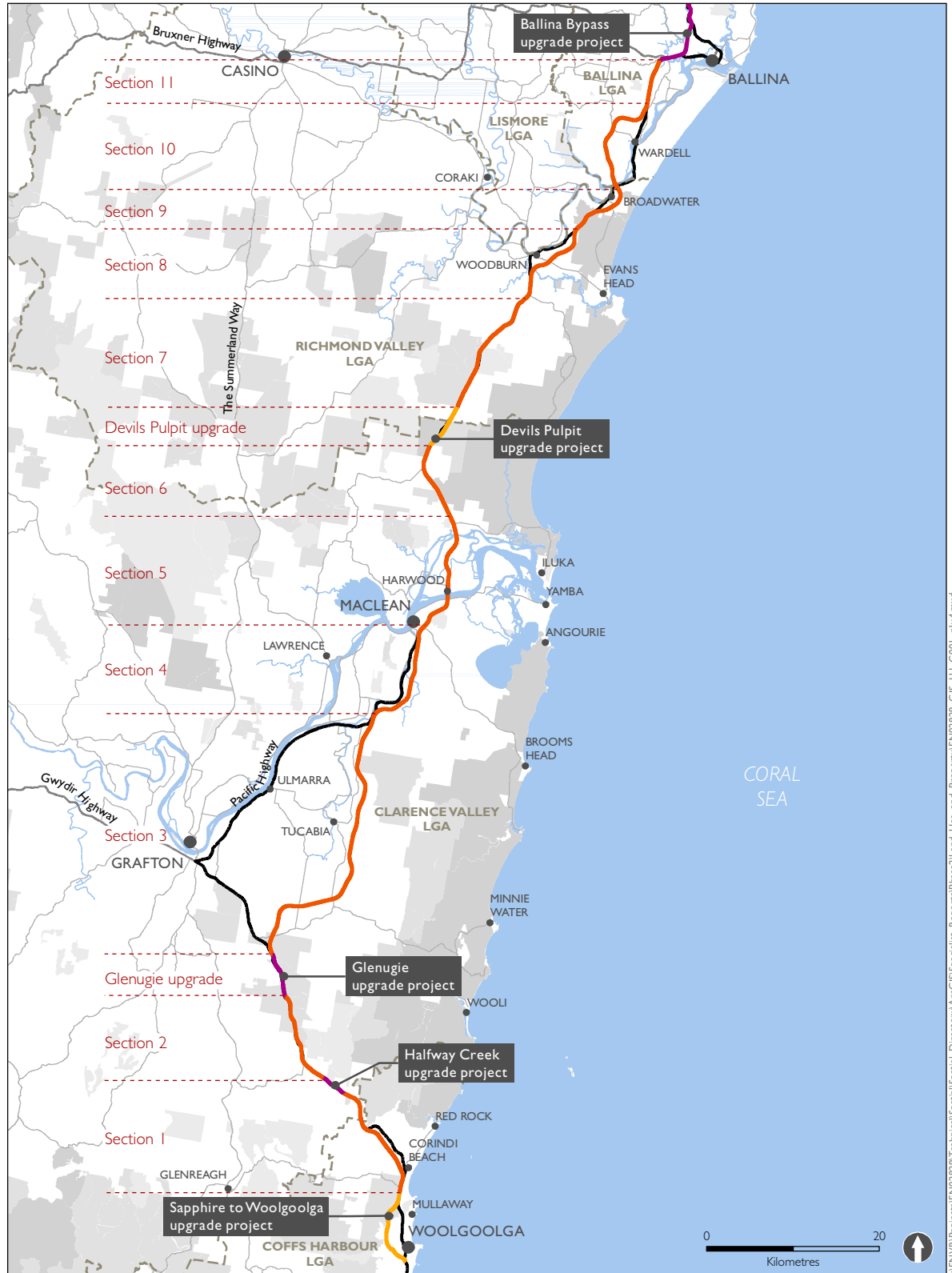
**Table 1-1 Project sections and lengths**

Project section	Location	Station		Length (kilometres)
		Start	Finish	
1	Woolgoolga to Halfway Creek	0	17.0	17.0
2	Halfway Creek to Glenugie upgrade	17.0	28.7	11.7
3	Glenugie upgrade to Tyndale	33.8	68.8	35.0
4	Tyndale to Maclean	68.8	82.0	13.2
5	Maclean to Iluka Road, Mororo	82.0	96.4	14.4
6	Iluka Road to Devil's Pulpit upgrade	96.4	105.6	9.2
7	Devil's Pulpit upgrade to Trustums Hill	111.1	126.4	15.3
8	Trustums Hill to Broadwater National Park	126.4	137.6	11.2
9	Broadwater National Park to Richmond River	137.6	145.1	7.5
10	Richmond River to Coolgardie Road	145.1	158.6	13.5
11	Coolgardie Road to Ballina bypass	158.6	164.0	5.4

An overview of the project alignment and project sections are shown in Figure 1-2 to Figure 1-6.

# Upgrading the Pacific Highway - Woolgoolga to Ballina Upgrade

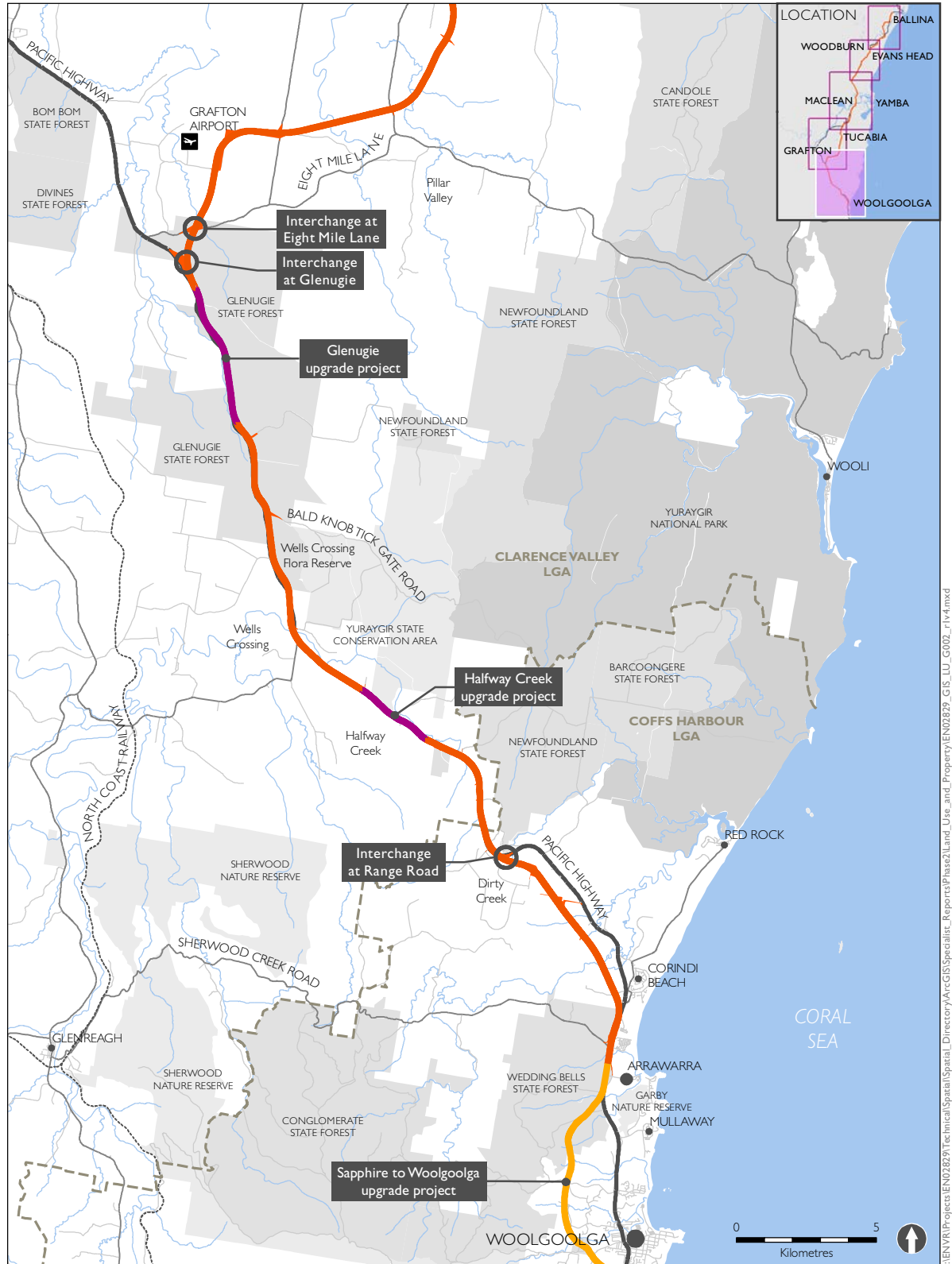
Figure I-1 Project overview



- The project
- Upgrade completed to dual carriageway
- Upgrade under construction
- Existing Pacific Highway

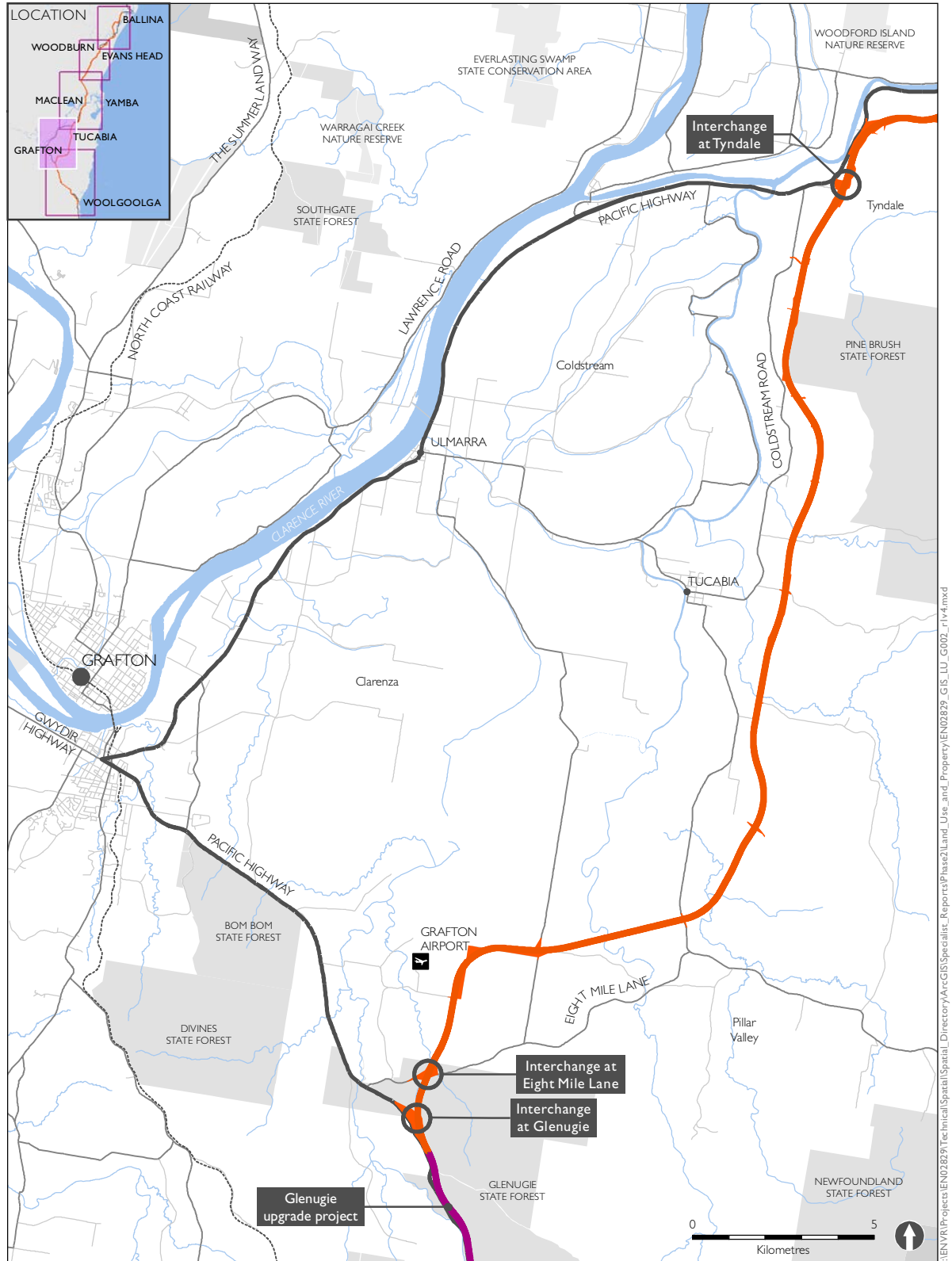
Upgrading the Pacific Highway - Woolgoolga to Ballina Upgrade

Figure I-2 The project alignment - Arrawarra to Glenugie



- The project
- Upgrade completed to dual carriageway
- Upgrade under construction
- Existing Pacific Highway

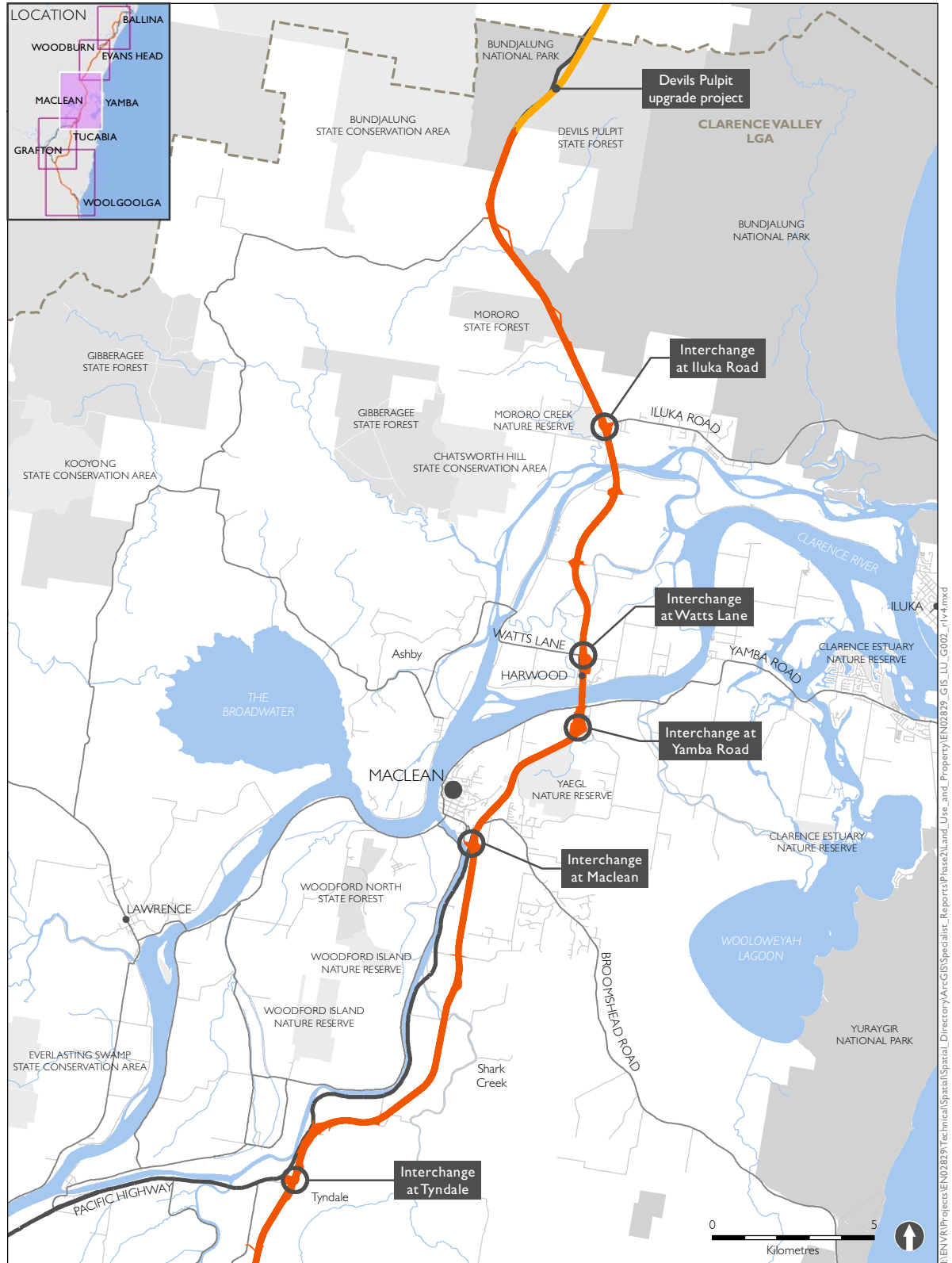
Figure 1-3 The project alignment - Glenugie to Tyndale



- The project
- Upgrade completed to dual carriageway
- Upgrade under construction
- Existing Pacific Highway

Upgrading the Pacific Highway - Woolgoolga to Ballina Upgrade

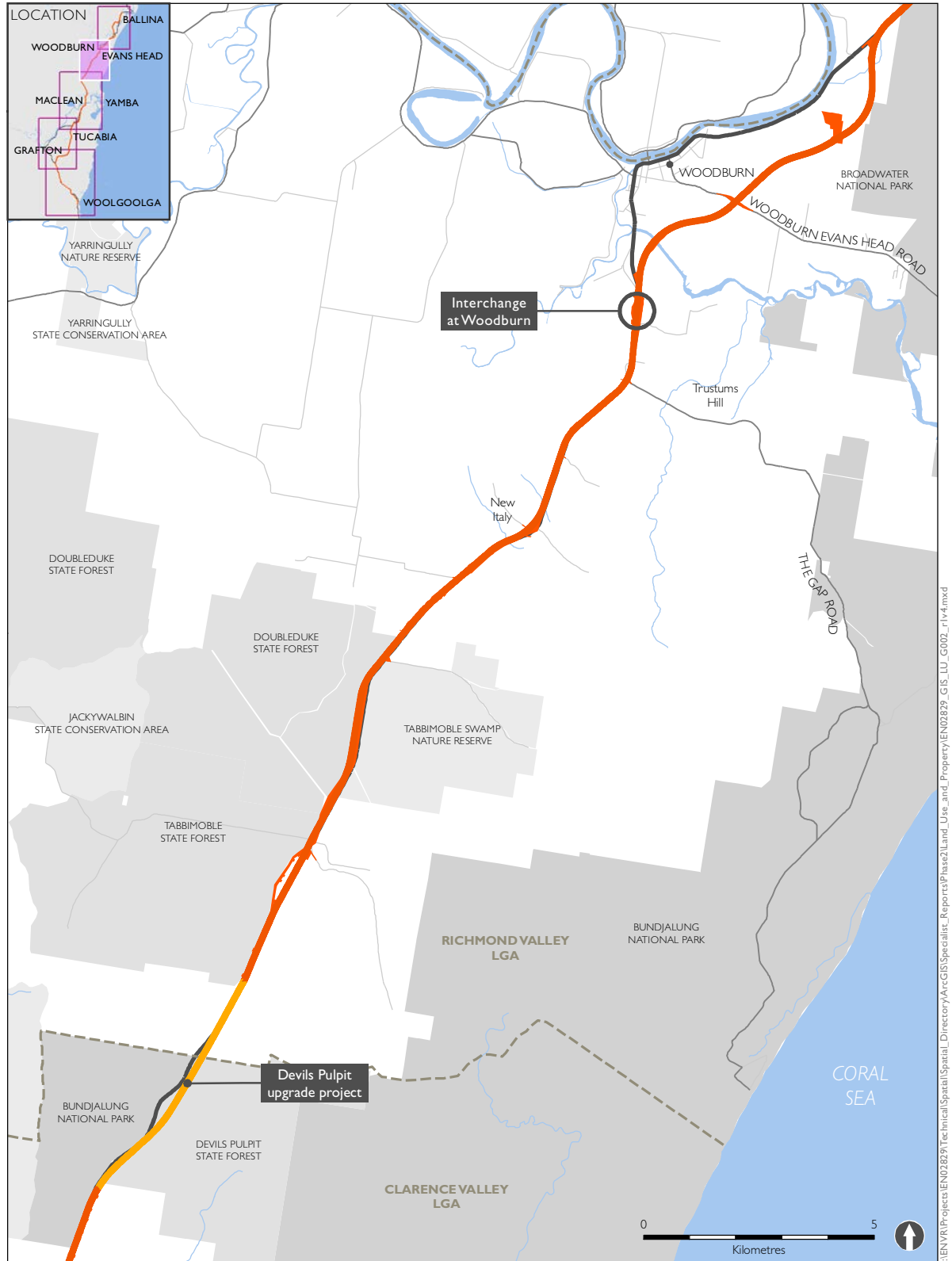
Figure I-4 The project alignment - Tyndale to Devils Pulpit



- The project
- Upgrade completed to dual carriageway
- Upgrade under construction
- Existing Pacific Highway

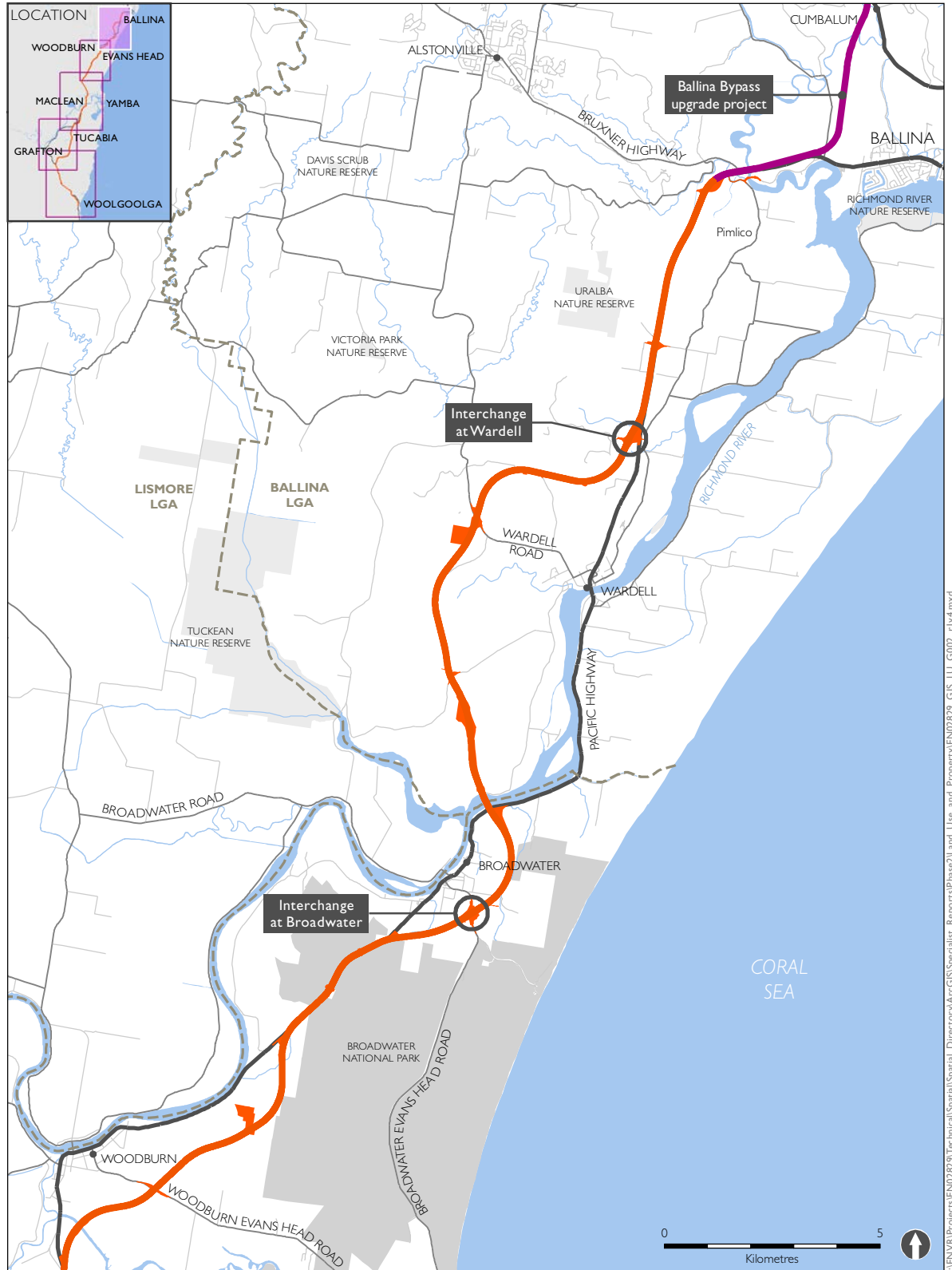


Figure I-5 The project alignment - Devils Pulpit to Woodburn



- The project
- Upgrade completed to dual carriageway
- Upgrade under construction
- Existing Pacific Highway

Figure I-6 The project alignment - Woodburn to Ballina



- The project
- Upgrade completed to dual carriageway
- Upgrade under construction
- Existing Pacific Highway

While the project is for a four-lane motorway standard upgrade, the construction and opening of the project would be staged. Staging could include some sections being constructed and opened initially as a four-lane arterial standard upgrade.

The project does not include the Pacific Highway upgrades at Glenugie and Devils Pulpit, which are located between Woolgoolga and Ballina, as Glenugie is now complete and Devils Pulpit is under construction. Together with the Glenugie and Devils Pulpit upgrades, the project would complete a total of 164 kilometres of upgraded highway between Woolgoolga and Ballina.

The key features of the project include:

- Around 155 kilometres of motorway standard highway, comprising a four-lane divided carriageway (two lanes in each direction) that can be upgraded to a six-lane divided carriageway in the future, if required
- Bypasses of Grafton, South Grafton, Ulmarra, Woodburn, Broadwater and Wardell
- Ten interchanges to provide access to and from the upgraded highway at:
  - Range Road (Corindi)
  - Glenugie (Eight Mile Lane)
  - Tyndale (Sheehys Lane)
  - Maclean (Goodwood Street)
  - Yamba Road (Harwood)
  - Watts Lane (Harwood)
  - Iluka Road (Woombah)
  - Woodburn (Trustums Hill Road)
  - Broadwater (Evans Head Road)
  - Wardell (Coolgardie Road)
- About 40 bridge crossings of waterways or floodplains, including bridges over the Clarence and Richmond rivers
- About 55 over bridge and underpasses structures to maintain access along local roads crossed by the project
- Viaducts located where the project would cross low-lying or flood-prone areas
- Service roads and access roads to maintain connections to existing local roads and properties
- Structures to help wildlife cross above or below the project including crossings for tree-dwelling mammals, dedicated culverts under the highway and over-land fauna bridges

- Rest areas located at around 50 kilometre intervals for both northbound and southbound traffic. These are located at:
  - Pine Brush (Tyndale) (north and southbound)
  - Mororo Road (southbound)
  - Richmond River (north and southbound)
  - Heavy vehicle weigh station located near Halfway Creek.

In addition to these key features, the project would include construction sedimentation basins, operational water quality basins and construction facilities such as compounds and batching plants.

Construction would be staged from 2013 onwards following project approval, depending on the availability of funding. Construction of the project would generally comprise the conventional techniques employed on most major highway projects, modified for specific environmental or engineering constraints. RMS seeks approval for construction working hours for all day (8am–5pm) on Saturdays and between 6am and 7pm on weekdays.

An indicative outline of construction activities may include:

- Establishment of the construction site and ancillary facilities
- Enabling works, including adjustments to utilities, property adjustments, works to existing drainage and provision of construction access roads
- Clearing and grubbing of vegetation, stripping of topsoil and stockpiling for re-use
- Construction of road cuttings and embankments
- Treating areas of soft soil to stabilise the underlying soil sub-layers
- Installing drainage and bridging structures
- Laying of pavement materials
- Installing pavement markings, signposting, street lighting and progressive landscaping.

The project would not be built in one phase. The project would be delivered in stages as further funding becomes available and to best manage construction and material resources. Stages would be identified that prioritise and target upgrades and works that would best deliver safety and traffic efficiency improvements, and best deliver value for money outcomes.

This working paper assesses the potential impacts of the full motorway standard upgrade for construction and operation. Where there are relevant differences between the full motorway standard upgrade and the initial upgrade to arterial standard, those impacts are also assessed. Impacts are generally identified through the eleven project sections identified above.

Further information on the description of the project and the assessment of other environmental aspects can be found in the main volume of the environmental impact statement.

## 1.2. Study objectives and purpose

The objective of this study is to assess land use and property impacts from project operation and construction. Key aims include:

- Describing and assessing existing land use and property context of the study area, regional land uses and planning, and local land use within or adjoining the project
- Providing details of land uses and properties directly and indirectly affected by the project
- Identifying measures to manage or mitigate the project's impacts on land use and property.

The study addresses the environmental assessment requirements from the Director-General of the NSW Department of Planning and Infrastructure. These are provided in Table 1-2 along with reference to those sections of this report where the requirements are addressed.

**Table 1-2 Director-General’s environmental assessment requirements**

Requirements	Where addressed
Impacts on directly affected properties and land uses, including impacts related to access, land use, property infrastructure, future development potential, property acquisition and land sterilisation and severance.	Section 4.1 – Land use and property impacts
The agricultural sector taking into account fragmentation and potential loss of regionally significant farmland as identified in the Northern Rivers Farmland Protection Project (Department of Planning, 2005) and Mid North Coast Farmland Mapping Project (Department of Planning, 2008), food production, stock/ agricultural diseases and the impact on quarantined properties of a revised road network, and impacts on travelling stock routes/ reserves (as relevant).	Section 4.3 – Agricultural land
The operation of State forest estate, including potential for fragmentation and sterilisation of resources, and access by forestry and other users.	Section 4.5.3 – State forests
Impacts on Crown land, reserves and assets, and land reserved under the National Parks and Wildlife Act 1974.	Section 4.1.3 – Land ownership
Impacts on natural resources, including mining, petroleum production and extractive resources utilisation.	Section 4.5 – Natural resources
Impacts on commercial fishing access and aquaculture operations, including impacts on oyster priority areas in accordance with the NSW Oyster Industry Sustainable Aquaculture Strategy 2006 (Department of Primary Industries).	Section 4.6 – Commercial fishing and aquaculture
Identification of services and utilities to be relocated.	Section 4.7 – Infrastructure and utilities

### 1.3. Definitions used in this report

The study area for this land use and property assessment includes that area within the operational and construction footprints of the project. It also includes the wider regional land use and property, including within the local government areas of Coffs Harbour, Clarence Valley, Richmond Valley and Ballina and the wider NSW North Coast and Mid North Coast regions.

The operational footprint of the project is generally around 100 to 150 metres wide with interchanges and areas of large cutting and earth embankments typically being wider (up to 200 metres). The operational footprint of the project also includes additional elements, such as local access roads and permanent water quality basins. All of these features are located within the project concept design boundary.

The construction footprint of the project includes features such as some construction sediment basins and ancillary facilities (such as compounds). These are often outside the concept design boundary.

All references to the project in this assessment include the operational and construction footprints.

### 1.4. Assessment methodology

This section provides the methodology used to assess the land use and property impacts of the project.

#### 1.4.1. Existing environment

The description of the existing environment provides details of the existing planning, land use and property, relevant to the project both locally and regionally. It includes:

- A review of existing State wide, regional and local planning legislation, policies and strategies relevant to the project and study area
- A review of existing land uses within the study area based on a desk based review of zoning maps, GIS (geographical information system) spatial data and aerial photography
- Identification of existing urban land uses, including residential and rural residential uses; industrial/ commercial uses; and recreation and community uses
- Identification and review of existing agricultural uses, including areas of regionally significant farmland; areas used for cropping, grazing and horticulture; existing stock routes; and agricultural infrastructure (i.e. irrigation and drainage, farm buildings, etc)
- Identification of existing conservation areas, including national parks, areas of wetlands and rivers, and areas of tree and shrub cover
- Identification of natural resource areas, including State forests, mining and petroleum areas, and extractive resource areas such as quarries

- Identification of commercial fishing and aquaculture operations, including oyster priority areas
- Identification of infrastructure and utilities, including electricity, water and telecommunications
- A review of land tenure, including areas of Crown land.

#### **1.4.2. Impact assessment and mitigation**

This assessment of land use and property impacts considers direct and indirect impacts on local and regional land use and property, associated with the construction and operation of the project. In particular, it considers impacts on:

- Urban land uses, including future development potential.
- Agricultural land uses, including loss of agricultural land, regionally significant farmland from property acquisition; changes to property access and potential for sterilisation and severance of agricultural land due to the location of the project; impact on agricultural infrastructure such as irrigation and drainage and farm infrastructure; impact on stock routes; and impact on farming operations from potential stock/ agricultural diseases
- Conservation areas, including direct impacts from property acquisition, sterilisation and severance of property and indirectly from changes to access
- Natural resource areas, including State forests, from property acquisition, fragmentation and sterilisation of resources, and changes to access
- Commercial fishing access and aquaculture operations
- Directly affected property and acquisition requirements, including the number and tenure of properties totally or partially affected by the project, and the area of affected land uses
- Future property development, including impact on the development potential of land partially impacted by the project or land adjoining the project
- Crown land in the project, fragmentation of land and changes to access
- Services and utilities, including the need for services and utilities to be relocated or protected during construction and/or operation of the project.

Measures are also identified to avoid, manage or minimise potential impacts on land use and property.

This assessment has been informed by community and stakeholder consultation undertaken for the project. This includes feedback on the proposed design from residents, property owners, industry groups and local and state government agencies.

## 2. Planning framework

This section provides an overview of the planning legislation and policy framework relevant to the project. This includes State, regional, local government land use and planning policies and strategies.

The strategies include strategic directions for future urban development, population growth and the need for additional housing. The strategies have been considered relative to the location of the project and the infrastructure associated with the Pacific Highway.

### 2.1. Legislation and policy

The *Environmental Planning and Assessment Act 1979* (EP&A Act) is the primary legislation guiding planning, land use and development within NSW, and the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a national scheme of environment and heritage protection and biodiversity conservation.

RMS is seeking approval for the project under Part 5.1 of the EP&A Act, as State significant infrastructure. The project is a controlled action under the EPBC Act in relation to listed threatened species and communities and listed migratory species. RMS is also seeking project approval from the Commonwealth Minister in accordance with the EPBC Act.

The approval processes under the EP&A and EPBC acts are described in Chapter 2 of the EIS. This includes an outline of NSW and federal legislation and approvals, which do not apply, or must be applied consistently to a Part 5.1 approval.

#### 2.1.1. Property acquisition legislation

Property acquisition for the project would be undertaken in accordance with the following legislation and policy:

- *Land Acquisition (Just Terms Compensation) Act 1991*
- *RMS Land Acquisitions Policy*
- *National Parks and Wildlife Act 1974*
- *Forestry Act 1916*
- *Aboriginal Land Rights Act 1983*
- *Crown Lands Act 1989.*



## **Land Acquisition (Just Terms Compensation) Act 1991**

The acquisition of land impacted by the project would be undertaken in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991* and RMS's *Land Acquisitions Policy* (RTA 1999). The objectives of the *Land Acquisition (Just Terms Compensation) Act 1991* are to:

- Guarantee that, when land affected by a proposal and eventually acquired, the amount of compensation will be not less than the market value of the land (unaffected by the project) at the date of acquisition
- Ensure compensation on just terms for the owners of land that is acquired by an authority of the State when the land is not available for public sale
- Establish procedures for the compulsory acquisition of land by authorities to simplify and accelerate the acquisition process
- Require an authority of the State to acquire land designated for acquisition for a public purpose where hardship is demonstrated
- Encourage the acquisition of land by agreement instead of compulsory acquisition.

## **RMS Land Acquisitions Policy**

RMS is currently consulting with directly affected property owners and has commenced negotiations with some property owners about the purchase of affected properties, in accordance with RMS's Land Acquisitions Policy.

A key requirement of the policy is for RMS to take all reasonable actions to inform affected landowners of the property and land acquisition process and their rights and responsibilities, including making available relevant legislation, guidelines and policies.

Actions involving landowners include:

- Conducting meeting(s) with affected landowners to present details of the process
- Providing opportunities to clarify the process for landowners, including answering questions and assisting landowners in the interpretation of information provided
- Providing information to landowners on:
  - Effects on their property (maps and images).
  - Acquisition steps.
  - Disposal steps.
  - Contact details for appropriate RMS personnel.

## **National Parks and Wildlife Act 1974**

The project would require the acquisition of land dedicated under the *National Parks and Wildlife Act* (ie as a national park or nature reserve). Before land dedicated under the Act is acquired, revocation of the land must be undertaken in accordance with the Act. This is undertaken via an Act of Parliament.

## **Forestry Act 1916**

The project would require the acquisition of land dedicated under the *Forestry Act 1916* (ie State forest). Before land dedicated under the *Forestry Act 1916* is acquired, revocation of the land must be undertaken in accordance with the Act. This involves one or more of the following means:

- Act of Parliament, where the land affected is declared as a flora reserve under s25 of the Act or where land is declared a Special Management Zone under s21 of the Act
- Resolution of both Houses of Parliament, where the land affected is not zoned for conservation purposes and exceeds 20 hectares
- Notice in the Government Gazette, where the land is not zoned for conservation purposes and does not exceed 20 hectares
- Negotiation of a potential land exchange between RMS and Department of Primary Industries of land acquired by RMS for other projects, which is of suitable quality in terms of remnant vegetation to be dedicated as State forest

## **Aboriginal Land Rights Act 1983**

The project would require the acquisition of land owned by two Local Aboriginal Land Councils. In accordance with the Aboriginal Land Rights Act 1983, land vested in an Aboriginal Land Council cannot be appropriated or resumed except by an Act of Parliament. If agreement cannot be reached with the affected Aboriginal Land Councils about land directly impacted by the project, an Act of Parliament would be required to compulsorily acquire the affected properties.

## **Crown Lands Act 1989**

The project would require the acquisition of Crown Land. Under the *Crown Lands Act 1989*, the Minister (administering the Crown Lands Act) may sell, lease, exchange or otherwise dispose of, or deal with Crown Land subject to such terms and conditions that they determine. This is undertaken via a notice published in a local or state-wide newspaper. The date of sale is at least 14 days from the date of the advertisement.

RMS would consult with Crown Lands about the acquisition of Crown Land properties.

## **2.2. Regional planning framework**

### **2.2.1. Mid North Coast Regional Strategy**

The *Mid North Coast Regional Strategy* (NSW Department of Planning 2009) establishes the guiding principles for planning and managing the future sustainable growth of the NSW Mid North Coast.

The strategy recognises the Pacific Highway as the primary north–south corridor for both inter- and intra-regional movements. It identifies the growth pressures that would be faced by the region and the importance of safe and efficient transport connections within and between regions along the Sydney–Brisbane corridor. The project would assist by further improving traffic safety and efficiency for the Mid North Coast region.

The strategy identifies a hierarchy of settlements comprising:

- Major regional centres, which are the focus of settlement, employment and regional services. Major regional centres in the study area include Grafton and Coffs Harbour
- Major towns, which support major regional centres by providing outreaches of regional services. Major towns near the project include Maclean and Woolgoolga
- Towns, which provide services to their local area. Towns near to the project include Yamba
- Inland and coastal villages, which are smaller settlements offering limited local services. A number of villages are located across the study area, including Harwood, Ulmarra and Tucabia.

The strategy also identifies proposed future urban release areas, which are to be developed to function as new communities with service provision to match the future population of the area. By 2031, the Mid North Coast population is expected to grow by more than 28 per cent to around 424,400 people (an increase of 94,000 people). Urban residential land is proposed to respond to population increases and assist with housing affordability. The strategy seeks to cater for an additional 59,600 new homes by 2031.

Gulmarrad and Townsend near Maclean are identified as future urban release areas. The Maclean Urban Catchment Local Growth Management Strategy identified that Gulmarrad is expected to accommodate a total population of 3,700 people, while Townsend it expected to accommodate up to 1,100 people.

The strategy recognises that the Mid North Coast region is rich in natural resources, such as fisheries, timber, groundwater, extractive resources and productive soils, and that these resources are an important part of the regional economy that require careful management. The strategy identifies the need for new development adjoining or adjacent to farmland, extractive resources, waterways, wetlands and areas with high value biodiversity to incorporate buffers to avoid land use conflict. The strategy identifies a number of extractive and mineral resources within the Clarence Valley and Coffs Harbour local government areas.

Overall, the project would support future development proposed in the Mid North Coast Regional Strategy through improved access to major centres and future growth areas within the region.

### **2.2.2. Mid North Coast Farmland Mapping Project**

The Mid North Coast Farmland Mapping Project identifies areas of regionally significant farmland to be protected from urban and rural residential development. Within the study area, it relates to the local government areas of Coffs Harbour and Clarence Valley.

The Mid North Coast Farmland Mapping Project identifies a range of objectives to guide development in regionally significant farmland areas. These relate to recognising and conserving the best farmland for current and future agricultural uses, keeping options option for future generations to produce a range of agricultural goods throughout the region, allowing for a range of activities that support agriculture, protecting agricultural land from adjacent development that may compromise agricultural uses and avoiding conflict between rural and non-rural land users.

The Mid North Coast Farmland Mapping Project also makes a number of recommendations relating to urban and rural residential zoning, environmental protection, protecting agricultural uses, strategic planning and infrastructure and facilities. The recommendations of the farmland project are implemented through the Mid North Coast Regional Strategy.

The project traverses areas identified within the Mid North Coast Farmland Mapping Project as regionally significant farmland.

### 2.2.3. Far North Coast Regional Strategy

The *Far North Coast Regional Strategy* (Department of Planning 2006) covers the local government areas of Ballina, Byron, Kyogle, Lismore, Richmond Valley and Tweed. The objective of the strategy is to guide sustainable growth in the region over the next 25 years.

The strategy describes the agreed NSW Government position on the future of the Far North Coast and is the main strategic planning document for the region. Over the next 25 years, the region's population is expected to grow by more than 26 per cent to 289,000 people (an increase of 60,400 people). To support this growth the Strategy identifies the need for an additional 51,000 homes. The Far North Coast Regional Strategy seeks to ensure that future development caters for this expected growth in population, while protecting the region's highly valuable natural and cultural resources.

Aims of the strategy relevant to the project include:

- Limiting development in places constrained by coastal processes, flooding, wetlands, important farmland and landscapes of high scenic, cultural and conservation value
- Ensuring provision of adequate land for new business and industry is well linked to transport and services, considering the advantages from the upgrading of the Pacific Highway, which would support the creation of the predicted additional 32,500 jobs needed in the region.

The strategy recognises the Pacific Highway as the primary north–south corridor for both inter- and intra-regional movements. It identifies the growth pressures that would be faced by the region and the importance of safe and efficient transport connections within and between regions along the Sydney–Brisbane corridor. Improvements to the Pacific Highway would provide greater transport efficiency and safety for residents and for intra- and inter-state movements.

The strategy requires planning for commercial and industrial land uses should consider their location, particularly regarding infrastructure, transport and access.

Infrastructure development, transport and access issues are therefore relevant project issues.

The strategy identifies a hierarchy of settlements comprising:

- Major regional centres, which are the focus of settlement, employment and regional services. Ballina is identified as a developing major regional centre
- Major towns, which support major regional centres by providing outreaches of regional services. The nearest major towns near the project include Murwillumbah and Casino

- Towns, which provide services to their local area. The closest town near to the project is Byron Bay
- Inland and coastal villages, which are smaller settlements. A number of villages are located across the study area, including Wardell, Broadwater, Woodburn and Evans Head.

Land use conflicts in rural areas should be carefully identified to reduce environmental risk associated with land use change. Much of the region is located along floodplains and near rivers, in particular the Clarence and Richmond Rivers. The strategy indicates the need for safe evacuation routes to be identified to minimise the risk to human health and life from flooding.

The strategy recognises that the Far North Coast region is rich in natural resources, including extractive resources and productive soils and that these are important to the regional economy. The strategy identifies the need for new development adjoining or adjacent to farmland, extractive resources, waterways, wetlands and areas with high biodiversity value to incorporate buffers to avoid land use conflict. The strategy identifies a number of extractive and mineral resources within the Ballina and Richmond Valley local government areas. The project would support future development within the far north coast region, through improved access and connectivity to major centres and future growth areas. It also provides opportunities to improve access for local and regional communities during flood events.

#### **2.2.4. Northern Rivers Farmland Protection Project**

The Northern Rivers Farmland Protection Project was developed in 2005 to establish a system of regional agricultural protection through the planning system.

The project is a response to the problem of incremental and substantial loss of agricultural land to urban development. The Farmland Protection Project seeks to protect important farmland from urban and rural residential development by mapping farmland and developing planning principles.

The project aims to protect a broad range of lands to cater for a range of agricultural industries that may be important currently or in the future, thereby keeping land options open for new crops and farming methods. Urban and rural residential development would be limited on land identified by the project so that areas with the most potential for production are not lost to urban uses.

Two main categories of farmland protection were developed and each has its own specific planning rules. They include:

- State farmland, which includes land that has a relatively unique combination of quality soils and landforms with a favourable climate
- Regional farmland which comprises land that is significant from a regional perspective but not necessarily unique.

A third category, 'other rural land', is also identified that includes small pockets of better quality land.

The project traverses areas identified within the Northern Rivers Farmland Protection Project as regionally significant farmland.

## 2.3. Local planning framework

### 2.3.1. Coffs Harbour City Council

Section 1 of the project between Woolgoolga and Halfway Creek traverses Coffs Harbour City Council local government area.

#### Strategic local planning

Coffs Harbour City Council guides future urban growth through a range of documents.

The draft *Coffs Harbour City Centre Plan* was released in August 2010. The plan describes a vision for Coffs Harbour as a major regional city in the mid north coast region. It sets the strategic framework for the Coffs Harbour City Centre to grow into a prosperous, vibrant and attractive city. The vision identified in the plan is to develop Coffs Harbour as a centre for jobs, key regional services, cultural activity, entertainment and tourism. Jobs would focus on high growth industries building the city's strengths in health, education, retail, tourism and cultural activities.

The *Rural Residential Strategy 2009* provides a framework for the release and management of rural residential land in the Coffs Harbour City local government area. The strategy is in line with the objectives of the *Mid North Coast Regional Strategy* and forecasts the need for 18,600 new dwellings by 2031 in Nambucca, Bellingen and Coffs Harbour. Future rural residential land would only be zoned for release if it is in accordance with an agreed local growth management strategy. Those areas near the project that have been identified for future rural residential development include Corindi and Red Rock. The project would help to improve regional access and connectivity between these future rural residential development areas and regional centres.

#### Coffs Harbour Local Environmental Plan 2000

The *Coffs Harbour Local Environmental Plan 2000* identifies objectives relevant to land use and property that include identifying where compatible development opportunities can occur throughout the Coffs Harbour local government area.

### 2.3.2. Clarence Valley Council

Sections 1 to 6 of the project between Halfway Creek and Devils Pulpit traverse the Clarence Valley Council local government area.

#### Strategic local planning

The *South Grafton Heights Precinct – Strategy for the Future* was released by Council in 2007, and amended by the Council on 19 April 2011. The strategy identifies the precinct and the town of South Grafton as providing additional capacity for both urban residential and rural residential development. The plan indicates that future development within the next 25 years is expected to be considerable.

Grafton is identified as a major regional centre for future urban growth in the *Mid North Coast Regional Strategy*. Urban growth in South Grafton is consistent with that strategic direction. Additional population growth in Grafton City is required in part to make existing services more viable, and to reverse the reduction in access to services, government agencies and the like in the Clarence Valley. There has been some expansion to existing urban residential zones and a reduction in rural residential zoned land, within the Grafton urban 'footprint'.

Strategies identified in the *South Grafton Heights Precinct Strategy* for future urban development and land use include:

- New urban residential development is to be located adjacent to existing urban development, transport nodes and services, infrastructure, employment opportunities, businesses and community services before spreading to more remote locations.
- Council should encourage increased residential development in existing urban areas compatible with local character, amenity and infrastructure requirements.

This suggests future development potential adjacent to major transport corridors is recognised by local planning policies, which is relevant to the project.

*The Maclean Urban Catchment Local Growth Management Strategy* was adopted by Council in August 2011. The purpose of the strategy is to provide guidance for the release of new residential and employment areas including timing and infrastructure needs to respond to the proposed growth in the area. Three growth areas have been identified and included in the strategy. These areas are identified in the Mid North Coast Regional Strategy and include:

- Townsend (proposed future employment lands)
- Gulmarrad (proposed future urban release areas)
- James Creek (proposed future urban release areas).

All sites are located east of Maclean and accessed via Brooms Head Road. The nearest interchange providing access to the proposed upgrade would be the interchange at Maclean (Goodwood Street, south).

The proposed structure for the Maclean urban catchment sees Maclean as the main town supported by residential satellites at Townsend, Gulmarrad and James Creek. The proposed total population is 10,000 people by 2031, an increase of 5,200 people over the current population. It is anticipated the proposed upgrade would support future development potential in these areas by promoting access to a major transport corridor.

### **Clarence Valley Council Local Environmental Plan 2011**

The *Clarence Valley Council Local Environmental Plan* was gazetted on 23 December 2011 and consolidates the five previous local environmental plans that applied to the valley as well as part of the *Richmond River Local Environmental Plan*. All of the previous local environmental plans are repealed (Copmanhurst LEP, Grafton LEP, Maclean LEP, Nymboida LEP and Ulmarra LEP).

The project supports the planned and projected growth in the Clarence Valley by promoting access to a major transport corridor.

Within the LEP, Zone SP2 Infrastructure provides for infrastructure and related uses, and seeks to prevent development that is not compatible with or that may detract from the provision of infrastructure.

### 2.3.3. Richmond Valley Council

Section 7 to Section 9 of the project between Devils Pulpit and Broadwater traverse the Richmond Valley Council local government area.

#### Strategic local planning

The *Richmond Valley Council Management Plan 2010–2013* aims to provide infrastructure of a high standard supporting community wellbeing, economic growth and environmental quality.

The project would assist the region to encourage new residential, commercial and industrial growth by promoting improved access, connectivity and transport efficiency including travel time savings. To address increased land use demands, the Council has focussed on the preparation of various land use planning documents which aim ‘to set aside sufficient land for a range of residential, commercial, industrial and community land uses which would cater for the projected population growth of the area over the next twenty years to the year 2025’.

The *Far North Coast Regional Strategy* identifies the Richmond Valley Council Local Government Area as an area of significant growth. This does not include rural residential growth where strong growth is currently occurring. To plan for this future development, the Council has adopted urban land release strategies for the four towns and villages in the local government area.

The *Woodburn Locality Plan 2008* identifies Woodburn as a community that often works together to enhance its strategic advantages. The project would support access and connectivity to surrounding land and provide opportunities for growth and development.

The project supports the direction of the Richmond Valley Council and would assist in facilitating transport connections to promote tourism and safety.

#### Richmond Valley Local Environmental Plan 2012

The *Richmond Valley Local Environmental Plan 2012* was gazetted in March 2012. The provisions of the new Local Environmental Plan commenced on 21 April 2012. The Richmond Valley plan aims to ensure adequate land is available in suitable locations for the needs of a range of beneficial and appropriate land uses.

### 2.3.4. Ballina Shire Council

The Ballina Shire Council area is traversed by Section 10 and Section 11 of the project between the Richmond River, Broadwater and Ballina.

#### Strategic local planning

The Council produced an *Urban Land Release Strategy* in 2000, which sought to respond to the future urban growth pressures. Council’s on-going program to maintain and extend the road network is integral to the release of urban land, as new and upgraded infrastructure such as the proposed upgrade may guide the location of new areas of housing.

The Ballina Shire Council *Community Strategic Plan 2010–2025* provides a framework for the development of a more sustainable shire between now and 2025. The plan identifies 26 desired outcomes.

The outcomes relevant to land use and the project include:



- Efficient and effective integrated transport
- Infrastructure and facilities that meet individual and community needs
- Respect the needs of different land users and land uses
- Maintain and improve our land-based productivity
- Preserve the potential for agricultural land and important extractive resources
- Buildings, infrastructure and public spaces that complement our natural environment
- Integrated land use.

The plan sets out a number of detailed actions to achieve the desired outcomes.

### **Ballina Shire Council Local Environmental Plan**

The Draft Ballina Local Environmental Plan 2011 is proposed to guide land use and development in the Ballina Shire local government area. This will replace the *Ballina Local Environmental Plan 1987*, which is currently the principle planning instrument in the local government area.

The project responds to the future plans and direction of the Ballina Shire Council.

## 3. Existing environment

This chapter provides an overview of the existing land use, planning and property conditions that characterise the project.

### 3.1. Existing environment overview

A review of existing land use and property indicates that:

- The project is located within the Coffs Harbour City, Clarence Valley, Richmond Valley and Ballina Shire local government areas. Land includes a mix of agricultural, urban and rural land uses. Land uses include residential development, highway and agri-based businesses, forested lands, national park, nature reserve, open woodland, foothills and floodplain. Townships include Tyndale, Maclean, Harwood, Woodburn, Broadwater and Ballina
- The southern end of the project includes the town at Corindi Beach within the Coffs Harbour local government area. Two tourist parks are located just south of Corindi Beach and there are numerous rural residential areas and properties. There are some agricultural land uses including blueberry farms and other smaller farms used for crops. Other land uses include State forest (Wedding Bells, Newfoundland and Glenugie State forests). The project passes partly through the Wells Crossing Flora Reserve located adjacent to the existing Pacific Highway
- The middle part of the project includes the townships of Tyndale, Maclean, Townsend and Harwood within the local government area of Clarence Valley. The existing Pacific Highway passes through or adjacent to agricultural land uses, forested land, State forest, nature reserves, national park, and rural residential development. Agricultural land use includes cropping, livestock grazing and cane farming. The project passes partly through Yaegl Nature Reserve, and is adjacent to Mororo Creek Nature Reserve and Bundjalung National Park. The project would cross the Clarence River, which is used for recreational boating and commercial fishing
- The upper part of the project includes the townships of Woodburn, Rileys Hill, Broadwater, Cabbage Tree Island, Empire Vale within the Richmond Valley and Ballina Shire local government areas. There is a mix of agricultural land uses, forested lands, and townships. There are several rural residential areas and properties across the project. The project passes through and adjacent to Broadwater National Park and adjacent to Tabbimoble Swamp Nature Reserve. The project would cross the Richmond River, which is used for some commercial fishing as well as recreational fishing and boating.

### 3.1.1. Townships

The main townships near the project are:

- Corindi Beach is a small coastal village located about 18 kilometres south-east of Halfway Creek and 35 kilometres north of Coffs Harbour, within the Coffs Harbour local government area
- Red Rock is a small coastal village located about six kilometres north-east of Corindi Beach and about 40 kilometres north-east of Coffs Harbour, within the Coffs Harbour local government area
- Grafton is located within the Clarence Valley Council local government area and is the major urban settlement and regional centre for the Clarence Valley region. The town is situated on the Clarence River and comprises the main town of Grafton north of the river and the urban area of South Grafton south of the river. The Pacific Highway currently passes to the eastern edge of South Grafton
- Tucabia is located about 10 kilometres east of Ulmarra and 25 kilometres north-east of Grafton within the Clarence Valley Council local government area
- Ulmarra is located within the Clarence Valley Council local government area, about 15 kilometres north of Grafton and adjacent to the Clarence River. The town is located either side of the Pacific Highway, with the town centre focused on Coldstream Street, running from the highway west towards the Clarence River. The town is considered one of Australia's finest examples of a 19th century river port and is classified by the National Trust
- The village of Tyndale is located south-east of the Pacific Highway, about nine kilometres south of Maclean and 31 kilometres north of Grafton
- Maclean and the nearby residential areas of Townsend and Gulmarrad, are located within the Clarence Valley Council local government area, about 46 kilometres north of Grafton and adjacent to the Clarence River. The Pacific Highway is located east of the main population and commercial centre of Maclean. However, the residential areas of Townsend and Gulmarrad are located east of the highway with access to Maclean via an underpass of the Pacific Highway at Jubilee Street
- The village of Harwood is located within the Clarence Valley Council local government area, about 50 kilometres north of Grafton. The town is located on the northern side of the Clarence River with the Pacific Highway bisecting the village in a north–south direction
- Woodburn is located about 36 kilometres south of Ballina. The town is divided by the Richmond River, with the majority of commercial and residential development located adjacent to the Pacific Highway, south of the river within Richmond Valley local government area. The residential area of North Woodburn is located within the Lismore local government area. The town provides an important access from the highway to Evans Head, which is located on the coast about 10 kilometres east of Woodburn

- Broadwater is situated on the Richmond River within the Richmond Valley Council local government area, about 25 kilometres south of Ballina. The town extends for a distance of about 2.5 kilometres along both sides of the Pacific Highway. The town supports the nearby rural village of Rileys Hill, located about three kilometres west of Broadwater.

## 3.2. Existing land uses

This section provides an overview of the existing land use pattern in the study area and more broadly in the wider local government areas of Coffs Harbour, Clarence Valley, Richmond Valley and Ballina.

### 3.2.1. Regional land use pattern

Land uses in the region are mainly farming and agricultural uses, particularly cropping and grazing. Grazing uses are mainly focussed on that area surrounding Grafton and west of Ballina within the Lismore local government area. Cropping uses are generally located near to the towns of Maclean, Harwood, Woodburn and Broadwater, and generally include land used for sugarcane. Pockets of horticultural uses are also located within the Coffs Harbour local government area west of Corindi and Halfway Creek, and in the Ballina local government area surrounding Alstonville.

Urban uses such as commercial, residential and industrial land uses are mainly focussed on major regional centres such as Coffs Harbour, Grafton, Lismore and Ballina. Residential, rural residential and/or commercial uses are also dispersed across the region within or close to towns such as Corindi Beach; Maclean, Townsend and Gulmarrad; Yamba; Woodburn and Trustums Hill; and Broadwater.

Large areas of the region are covered by conservation uses, including national parks, nature reserves, State conservation areas, and areas of tree and shrub cover. These are generally located in the southern section of the study area, in the Coffs Harbour and Clarence Valley local government areas, east of the Pacific Highway, as well as in the northern section of the Clarence Valley local government area and southern section of the Richmond Valley local government area. In addition, sections of the project pass through areas of State forest, including at Glenugie, Mororo, Devils Pulpit and Tabbimoble.

### 3.2.2. Local land use patterns

This section identifies the local land use patterns and types of properties within the study area.

#### Coffs Harbour

Section 1 of the project includes land within the Coffs Harbour local government area between Woolgoolga and Halfway Creek. The alignment generally follows the existing Pacific Highway for much of this section.

Where the alignment deviates from the existing Pacific Highway, land uses near the project mainly include:

- Tree and shrub cover, such as native forests
- Farmland used for grazing uses and horticultural uses, such as banana plantations, vine fruits and irrigated tree fruits. This includes the Blueberry Exchange at Range Road, Corindi.

Areas of urban uses are also located adjacent to the existing Pacific Highway at Corindi Beach and Corindi. Two quarries are located near to the project, north of Corindi.

### **Clarence Valley**

Section 1 to Section 6 includes land within the Clarence Valley local government area between Halfway Creek and Devils Pulpit. The majority of the project in the Clarence Valley generally follows the existing Pacific Highway, apart from that section between Glenugie and Tyndale.

Land uses within Section 2 mainly comprise:

- Tree and shrub cover such as native forest
- Conservation areas such as national parks and reserves
- State forests, including the Newfoundland and Glenugie State forests.

Between Glenugie and Tyndale, land west of the project mainly comprises grazing uses, with tree and shrub cover and conservation areas extending east of the project to the coast. The Pine Brush State Forest is located south of the interchange at Tyndale. Cropping uses are also located near the proposed interchange at Tyndale. Horticultural uses, urban uses and mining and quarry uses are also dispersed across this section of the study area.

Between Tyndale and the interchange at Iluka Road, cropping uses such as sugar cane, are the main land uses near to the project. Within this part of the project, urban land uses are focussed on Maclean and the nearby areas of Townsend and Gulmarrad, as well as Harwood and Woombah.

Tree and shrub cover, State forest and conservation uses are the main land uses north of the Iluka Road interchange. Areas of land used for cropping and grazing also occur.

### **Richmond Valley**

Section 7 to Section 9 includes land within the Richmond Valley local government area between Devils Pulpit and the Richmond River. The project generally follows the existing Pacific Highway apart from deviations away from the existing highway at Woodburn and Broadwater.

Conservation uses, tree and shrub cover and State forests are the main land uses in these sections of the project. This includes Broadwater National Park, which has high conservation values. Urban uses are focussed on Woodburn and Broadwater as well as rural residential land at Trustums Hill. Land used for cropping, particularly sugar cane, and grazing are located around Woodburn and Broadwater and within the project boundary. Small pockets of horticultural land are also located near to the project north of Woodburn.

## **Ballina**

Section 10 and Section 11 are located in the Ballina Shire local government area. Within these sections, the project deviates from the existing Pacific Highway north of Broadwater to the interchange at Wardell, and then follows the existing highway to Teven Junction located west of Ballina.

Land uses in these sections comprise mainly agricultural uses such as grazing, sugar cane crops and horticulture. Rural residential uses are also located near to the project in this section, west of Wardell, with Wardell the main focus for other urban land uses. Areas of tree and shrub cover are also located in these sections of the project, particular west of Wardell.

### **3.3. Urban land**

Urban land uses near to the project are located around existing regional centres, such as Coffs Harbour, Grafton and Ballina, as well as towns and villages such as Tucabia, Maclean, Townsend, Harwood, New Italy, Trustums Hill, Woodburn, Broadwater, and Wardell.

Urban land uses are mainly located on land adjoining or near to the existing Pacific Highway, although some smaller pockets of rural residential land are located away from the existing highway, including near that section of the project between Glenugie and Tyndale.

#### **Future urban development areas**

Areas identified for future development are located within the Clarence Valley local government area close to the project. These include Clarenza, Junction Hill, West Yamba and Gulmarrad. Combined, these four major urban land release areas are expected to provide an additional 3,000 residential lots. Access to the highway will be important to the future growth of these areas.

### **3.4. Agricultural land**

The study area comprises a range of agricultural land uses, including regionally significant farmland; cropping land, particularly sugar cane; and grazing.

#### **3.4.1. Regionally significant farmland**

Regionally significant farmland includes “land capable of sustained use for agricultural production with a reasonable level of inputs and which has the potential to contribute substantially to the on-going productivity and prosperity of a region” (State of NSW 2009).

The *Northern Rivers Farmland Protection Project* also identifies areas of State significant farmland. This distinguishes very high quality and unique agricultural soils/lands from other lands that are important to agriculture, but which are more extensive and less productive generally per unit area (Department of Infrastructure, Planning and Natural Resources 2005).

There are no areas of State significant farmland impacted by the project. However, an area of State significant farmland is located west of the project in Section 10, between Wardell Road and Bagotville Road.

Areas of regionally significant farmland are also located near to the project, including:

- West of Corindi and Corindi Beach (Section 1)
- South of Tyndale (Section 3) and west of the project extending west from Tucabia to the Clarence River
- Between Tyndale and Maclean (Section 4).
- North of Maclean and west of the existing Pacific Highway, and north of the Clarence River at Harwood to Iluka Road (Section 5)
- East of Woodburn (Section 8)
- West of the existing Pacific Highway, adjacent to the Richmond River and north of Broadwater (Section 9)
- North of the Richmond River, extending south of Bagotville west of the project, and south of Wardell, east of the project (Section 10)
- North of the project, extending between the existing Pacific Highway and Wardell Road (Section 11).

The location of regionally significant farmland near the project is shown on Figure 3-1. This map also shows areas of state significant farm land and prime agricultural land, and is based on a data set from the Department of Primary Industries.

### **3.4.2. Cropping land**

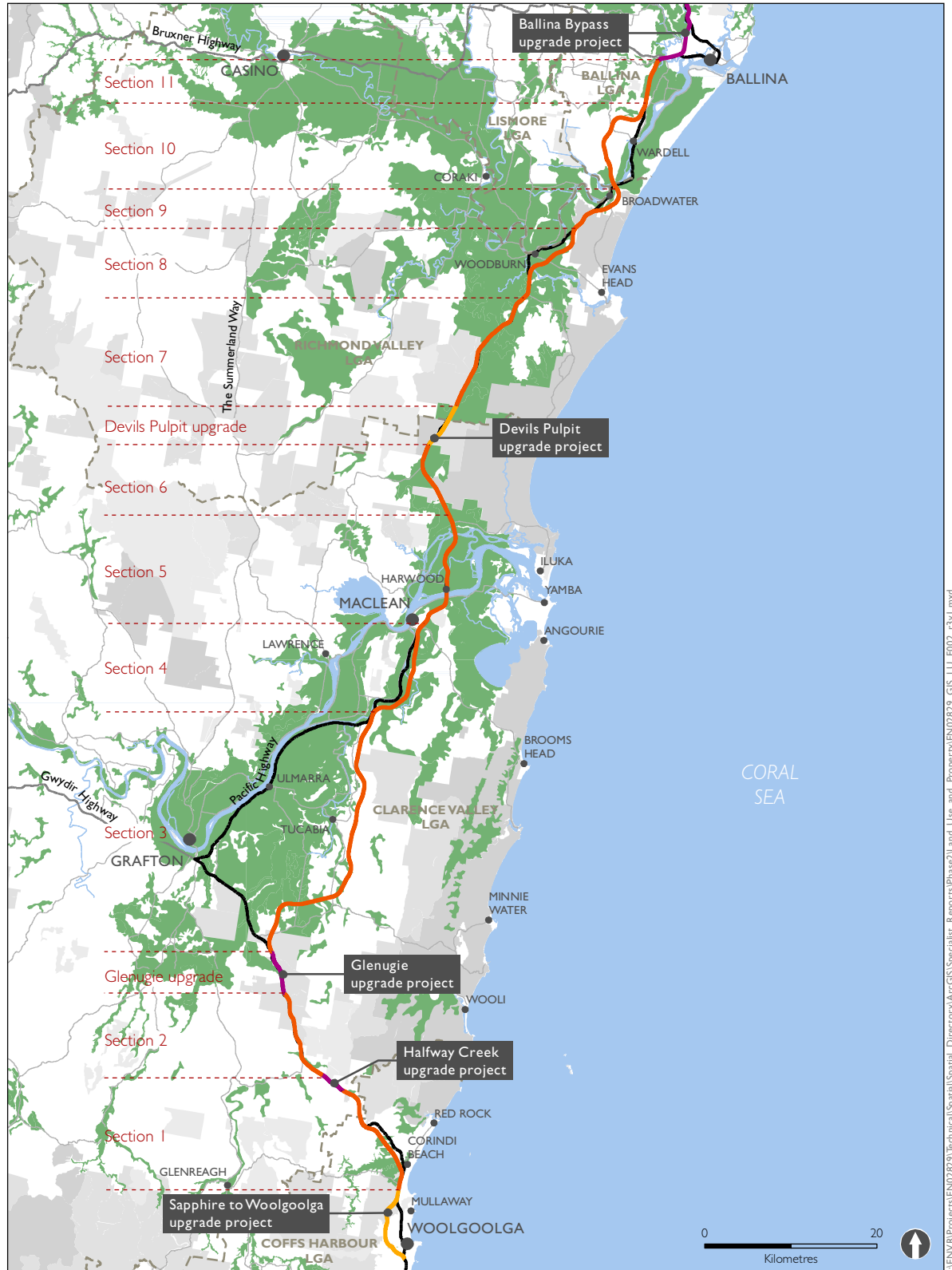
Land identified for cropping in the study area is mainly used for sugar cane growing. Cropping land is mainly located in the northern part of the Clarence Valley local government area and within the Richmond Valley local government area.

Overall, cropping land is scattered along the project north of about Tucabia, with particular concentrations of cropping land near the project:

- East of the existing Pacific Highway between Tyndale and Maclean (Section 4)
- Between the existing Pacific Highway and the Clarence River, north of Maclean; and north of the Clarence River at Harwood extending to Iluka Road at Woombah (Section 5)
- East of Woodburn (Section 8)
- West of the existing Pacific Highway, adjacent to the Richmond River and north of Broadwater (Section 9)
- North of the Richmond River, extending west of the project, and south of Wardell, east of the project (Section 10)
- North of the proposed interchange at Wardell (Section 11)

The location of cropping land near the project is shown in Figure 3.2a to Figure 3.2k.

Figure 3-1 Regionally significant farm land and prime agricultural land

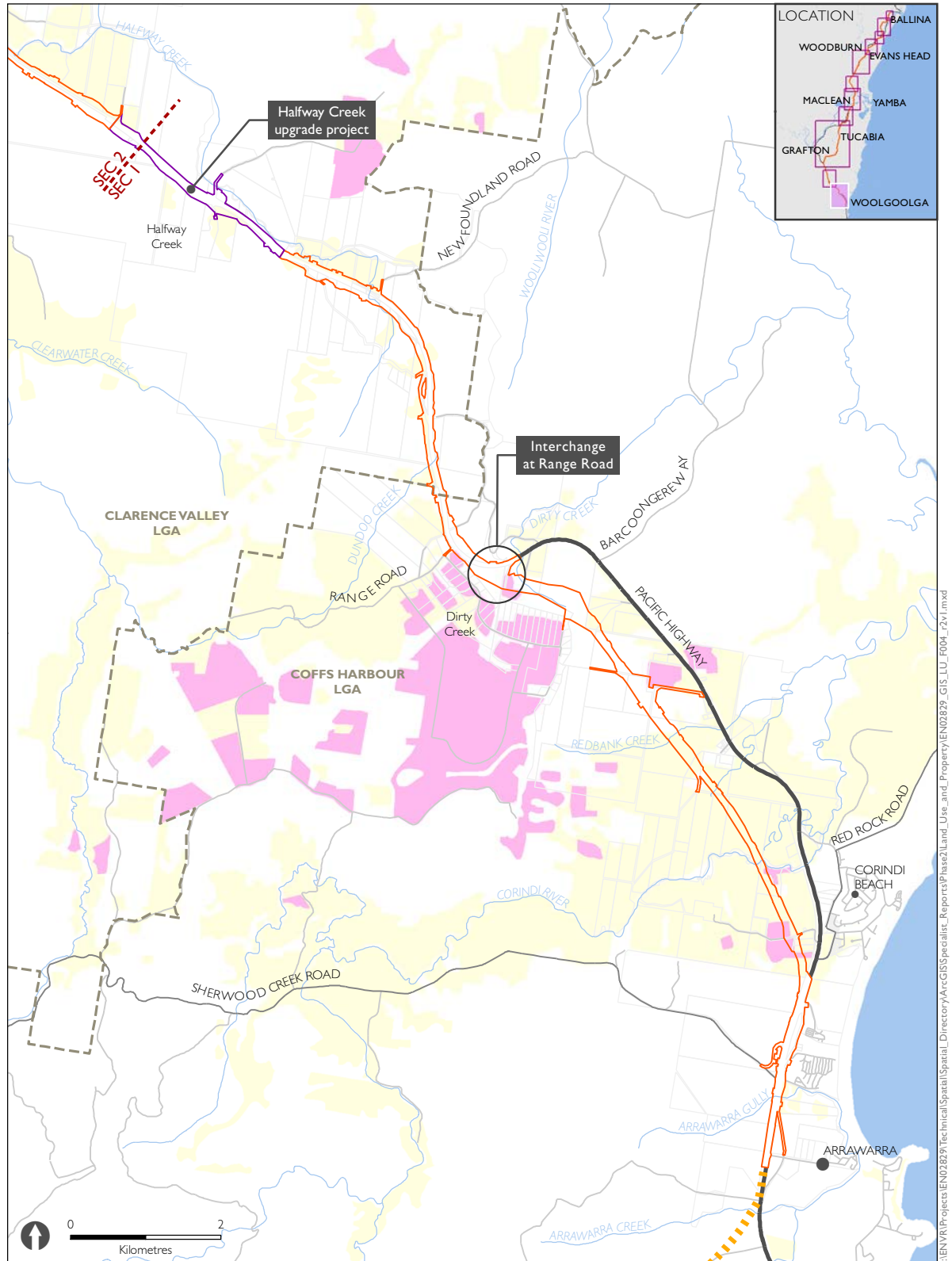









- The project
- Upgrade completed to dual carriageway
- Upgrade under construction
- Existing Pacific Highway
- Regionally significant farm land and prime agricultural land

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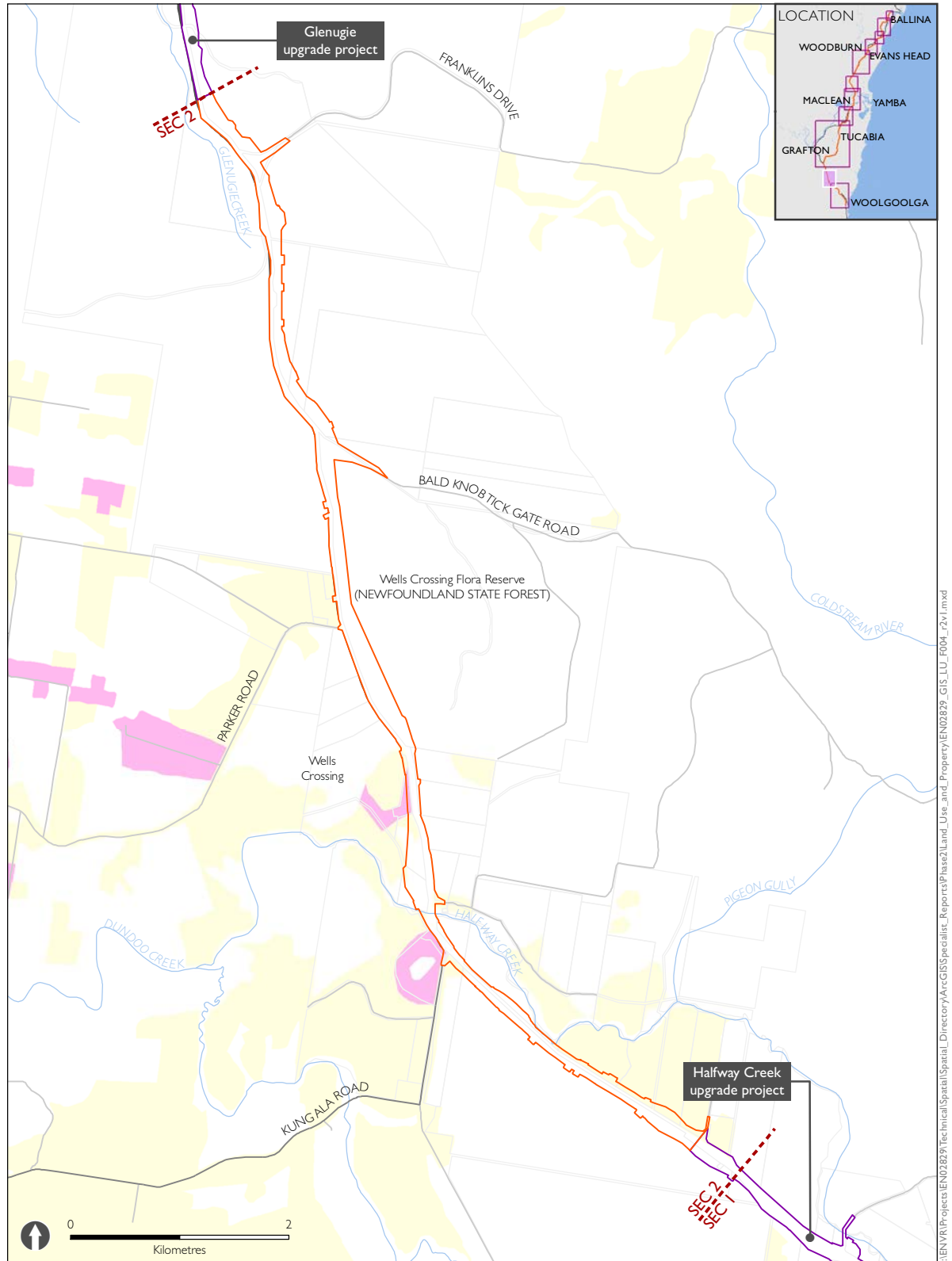
Figure 3-2a Affected agricultural land uses



- |   |  |
|---|--|
|  The project                           |  Grazing      |
|  Upgrade completed to dual carriageway |  Cropping     |
|  Upgrade under construction            |  Horticulture |
|  Existing Pacific Highway              |  |

Upgrading the Pacific Highway - Woolgoolga to Ballina Upgrade

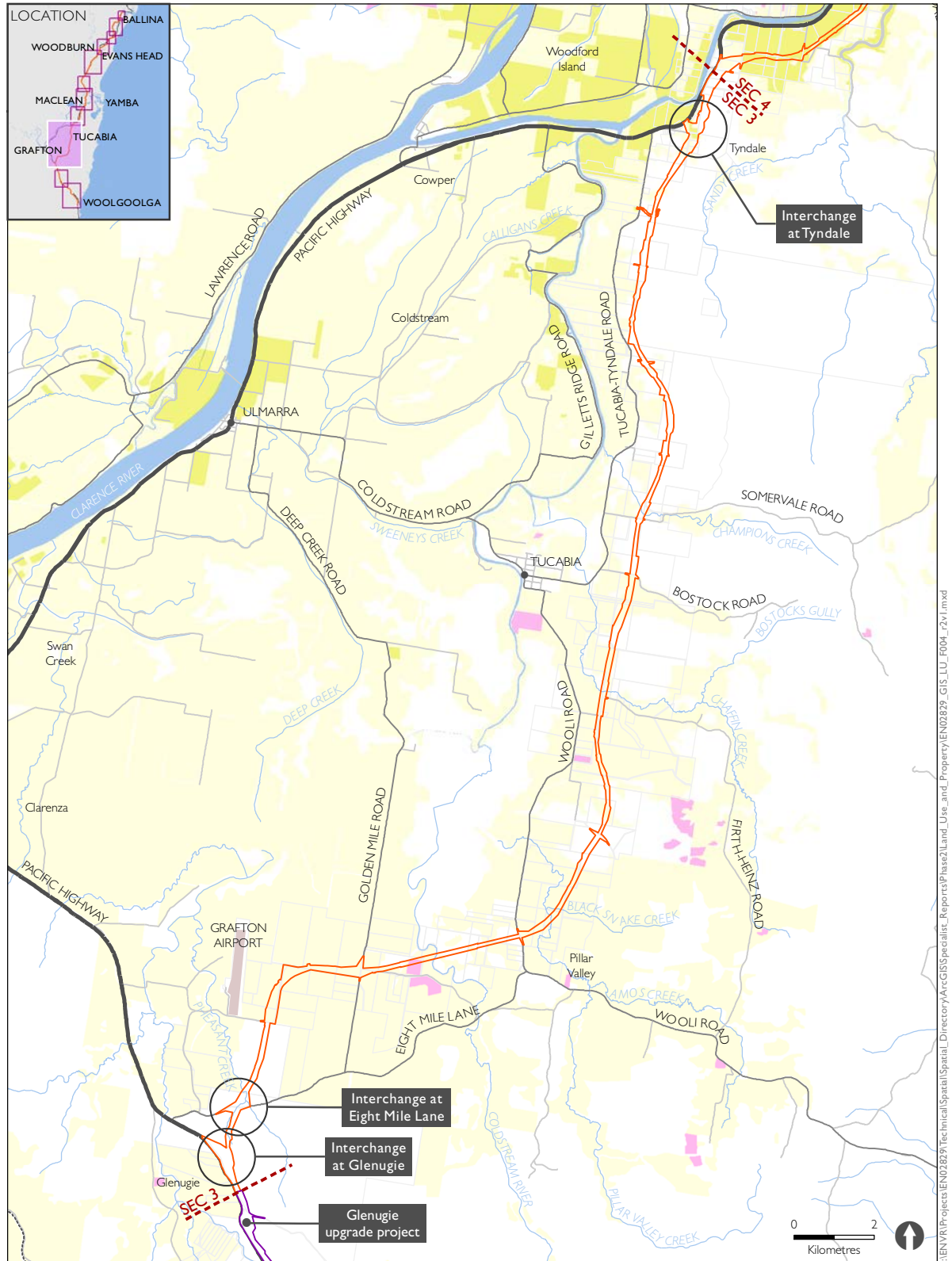
Figure 3-2b Affected agricultural land uses



- |  |                                       |  |              |
|--|---------------------------------------|--|--------------|
|  | The project                           |  | Grazing      |
|  | Upgrade completed to dual carriageway |  | Cropping     |
|  | Upgrade under construction            |  | Horticulture |
|  | Existing Pacific Highway              |  |              |

Upgrading the Pacific Highway - Woolgoolga to Ballina Upgrade

Figure 3-2c Affected agricultural land uses



- The project
- Upgrade completed to dual carriageway
- Upgrade under construction
- Existing Pacific Highway
- Grazing
- Cropping
- Horticulture

Figure 3-2d Affected agricultural land uses

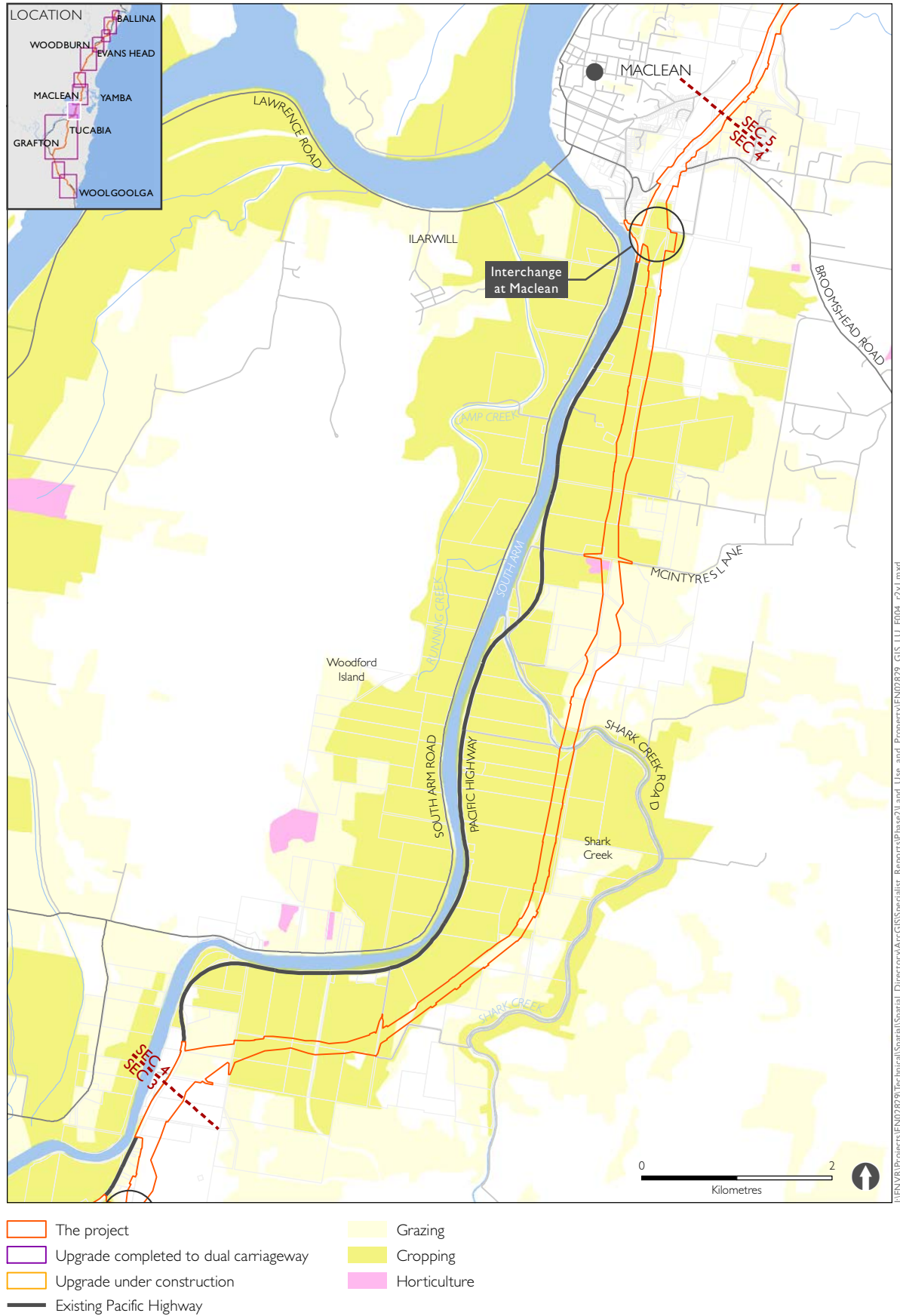
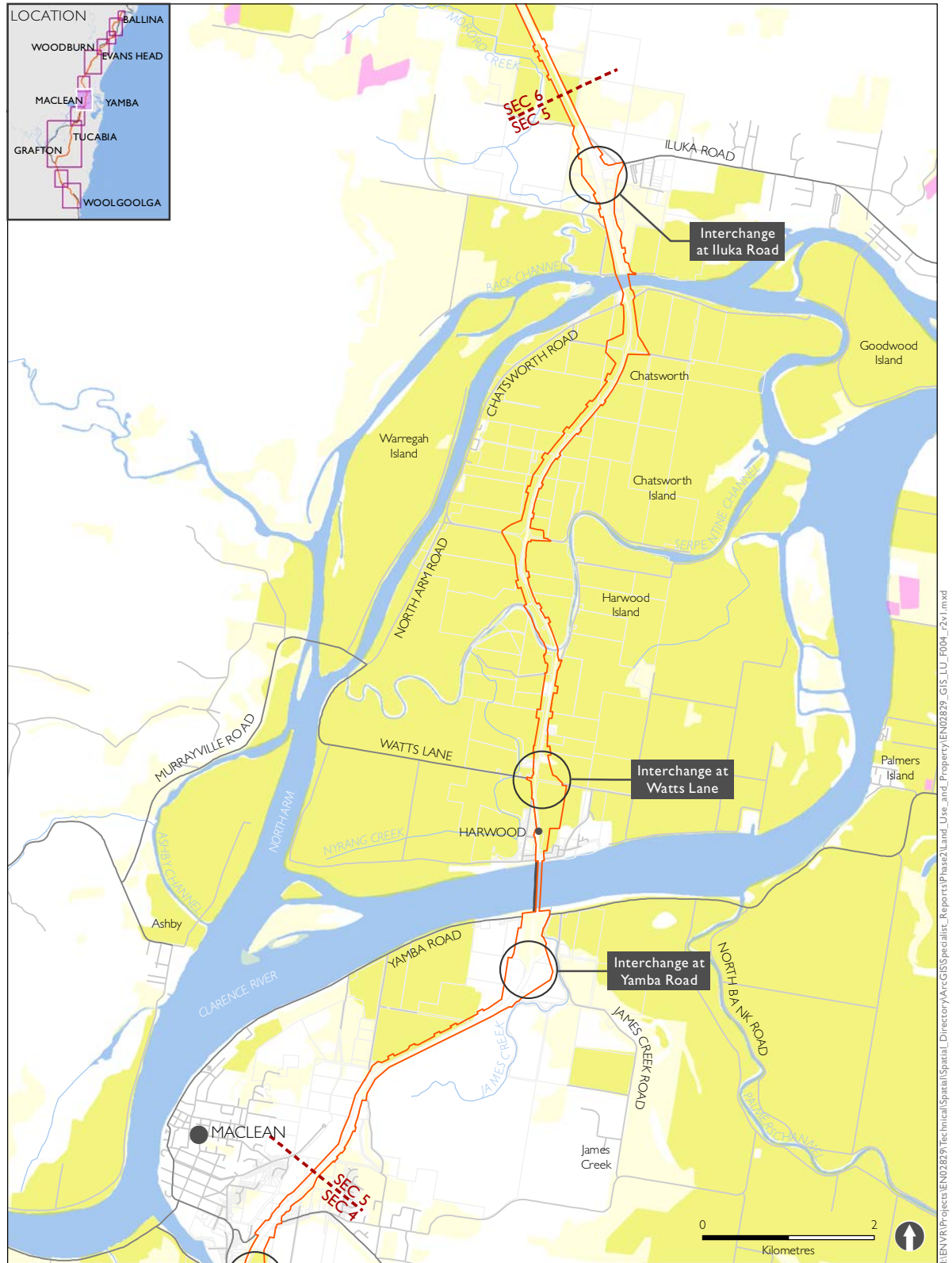


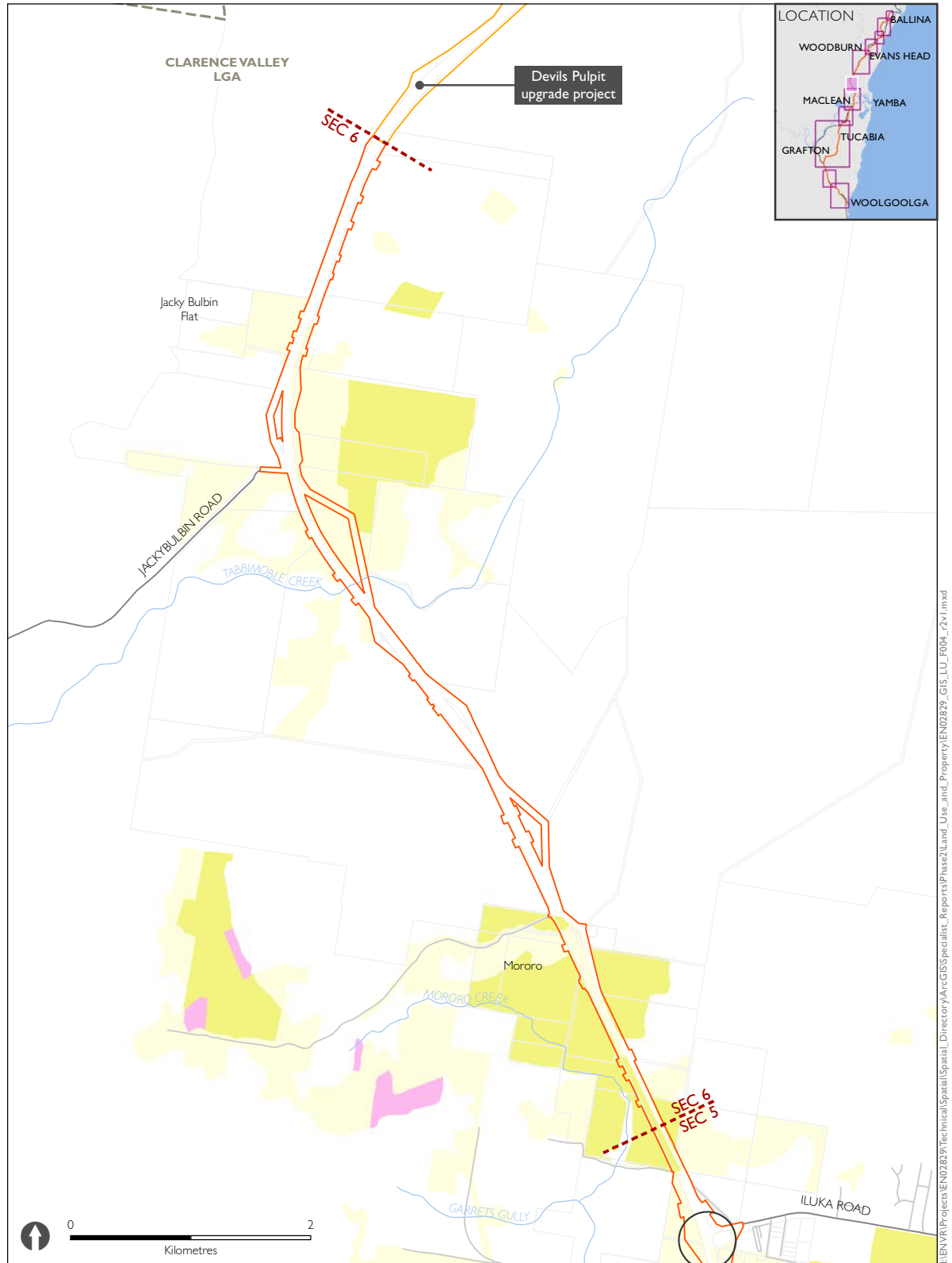
Figure 3-2e Affected agricultural land uses



- |                                       |              |
|---------------------------------------|--------------|
| The project                           | Grazing      |
| Upgrade completed to dual carriageway | Cropping     |
| Upgrade under construction            | Horticulture |
| Existing Pacific Highway              |              |

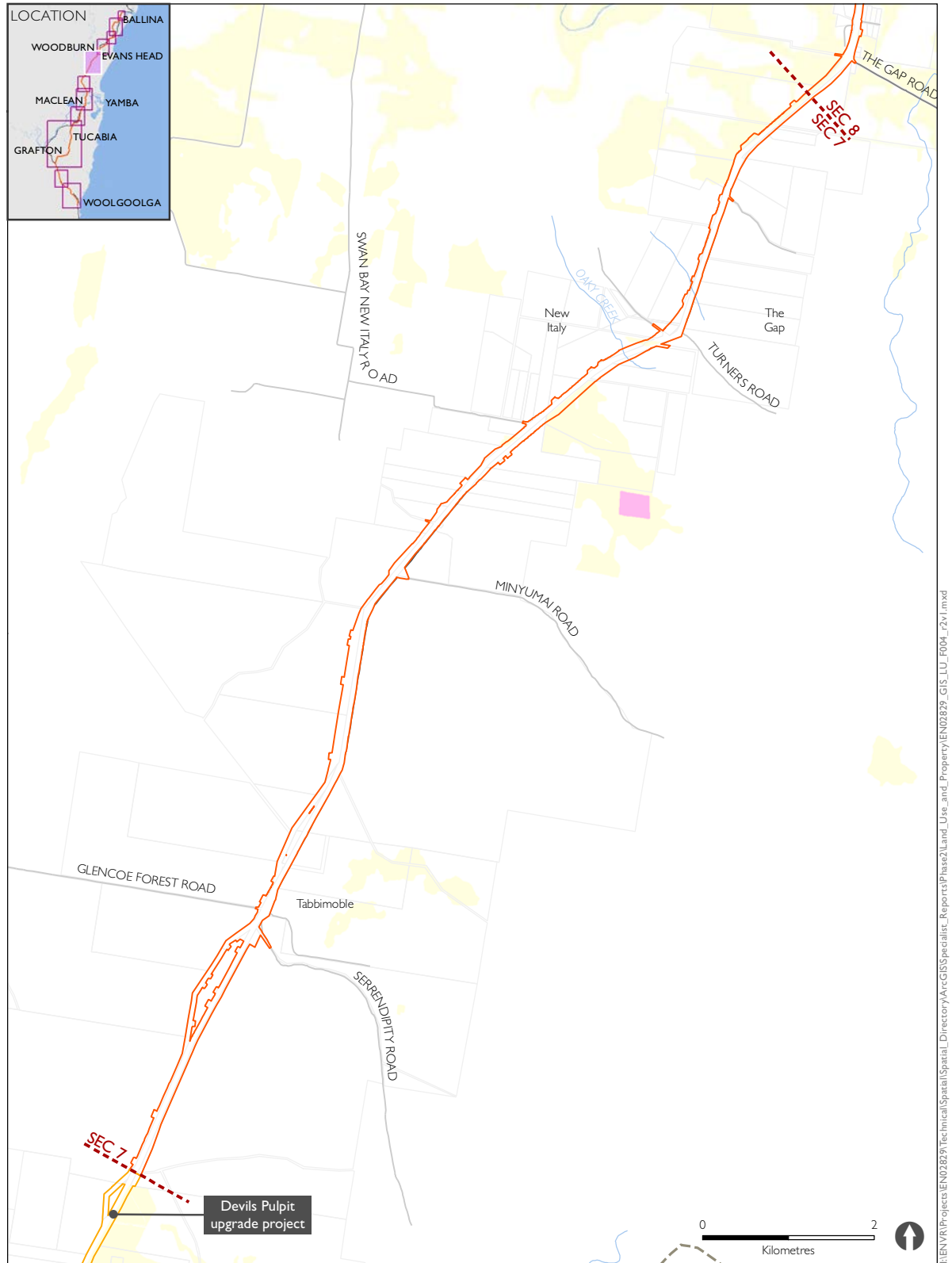
Upgrading the Pacific Highway - Woolgoolga to Ballina Upgrade

Figure 3-2f Affected agricultural land uses



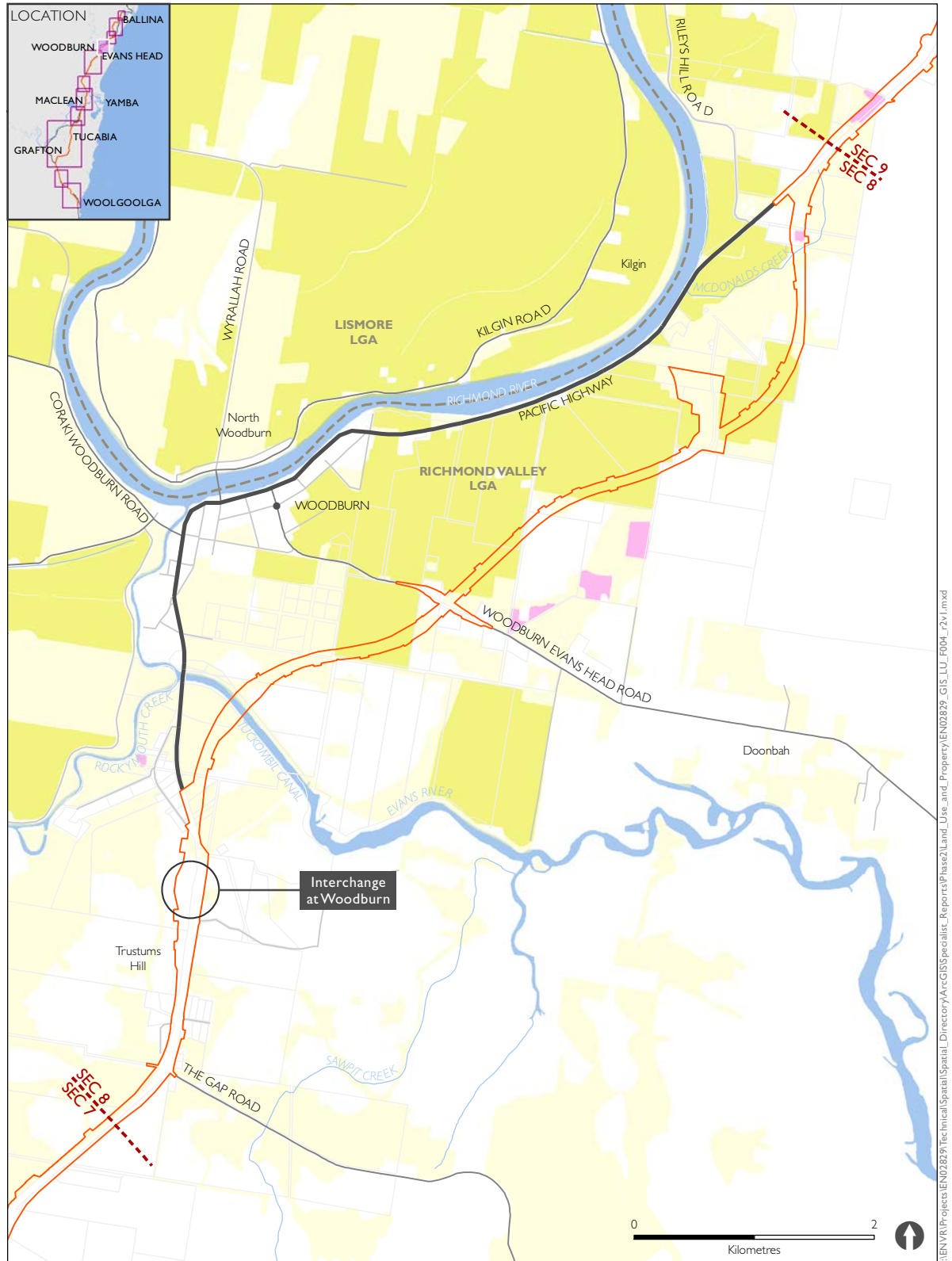
- |                                       |              |
|---------------------------------------|--------------|
| The project                           | Grazing      |
| Upgrade completed to dual carriageway | Cropping     |
| Upgrade under construction            | Horticulture |
| Existing Pacific Highway              |              |

Figure 3-2g Affected agricultural land uses



- The project
- Upgrade completed to dual carriageway
- Upgrade under construction
- Existing Pacific Highway
- Grazing
- Cropping
- Horticulture

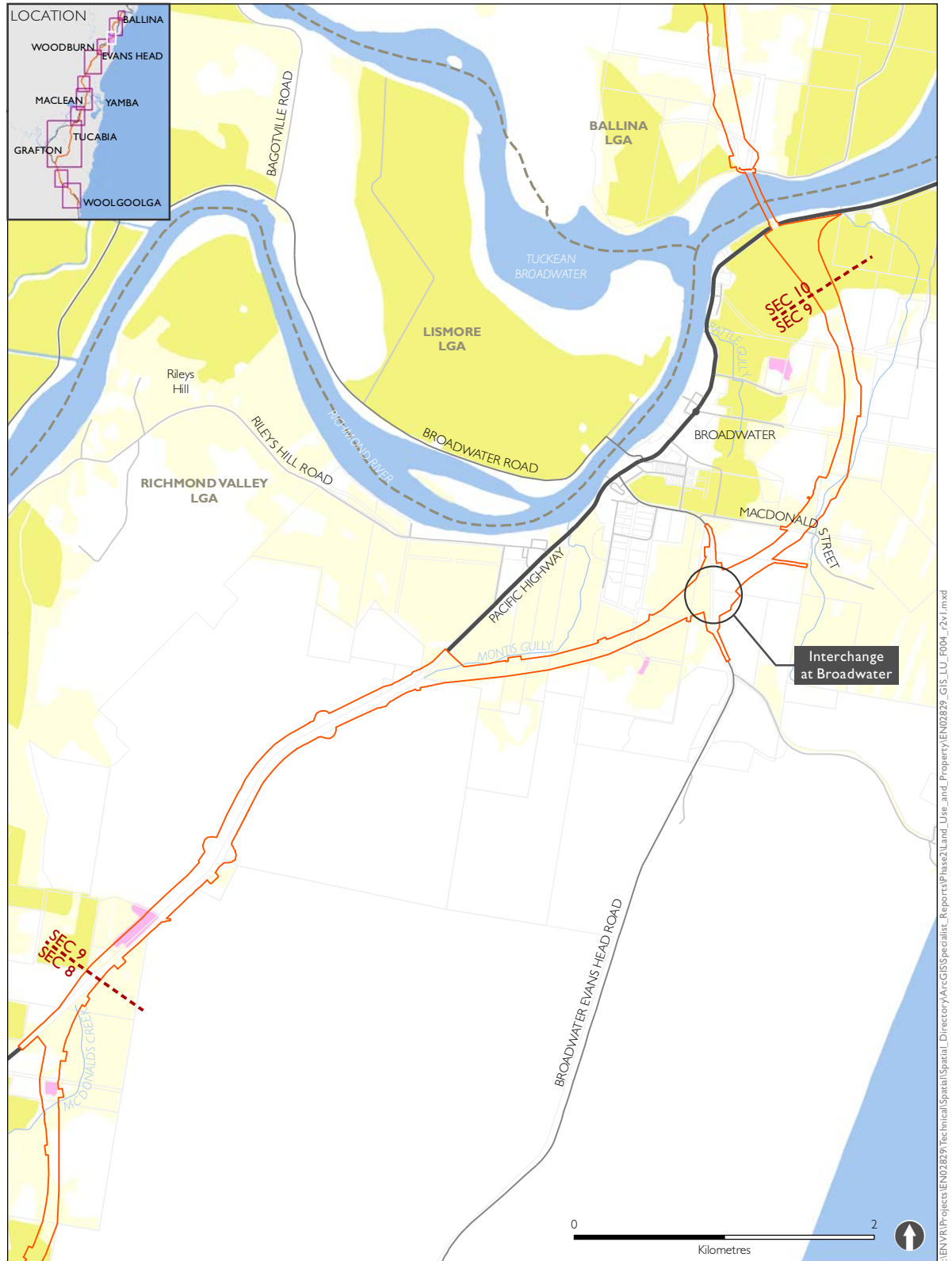
Figure 3-2h Affected agricultural land uses



- The project
- Upgrade completed to dual carriageway
- Upgrade under construction
- Existing Pacific Highway
- Grazing
- Cropping
- Horticulture

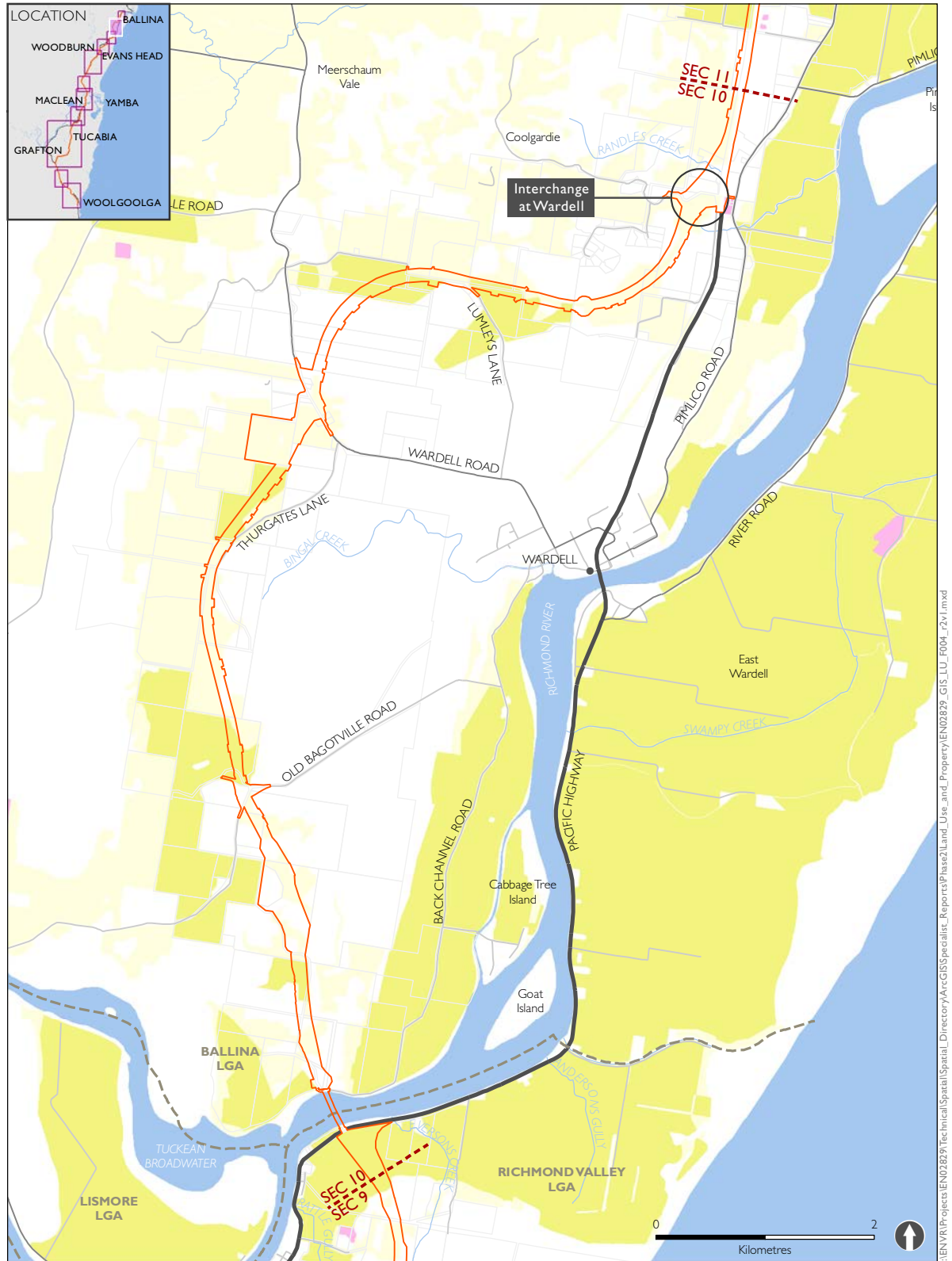


Figure 3-2i Affected agricultural land uses



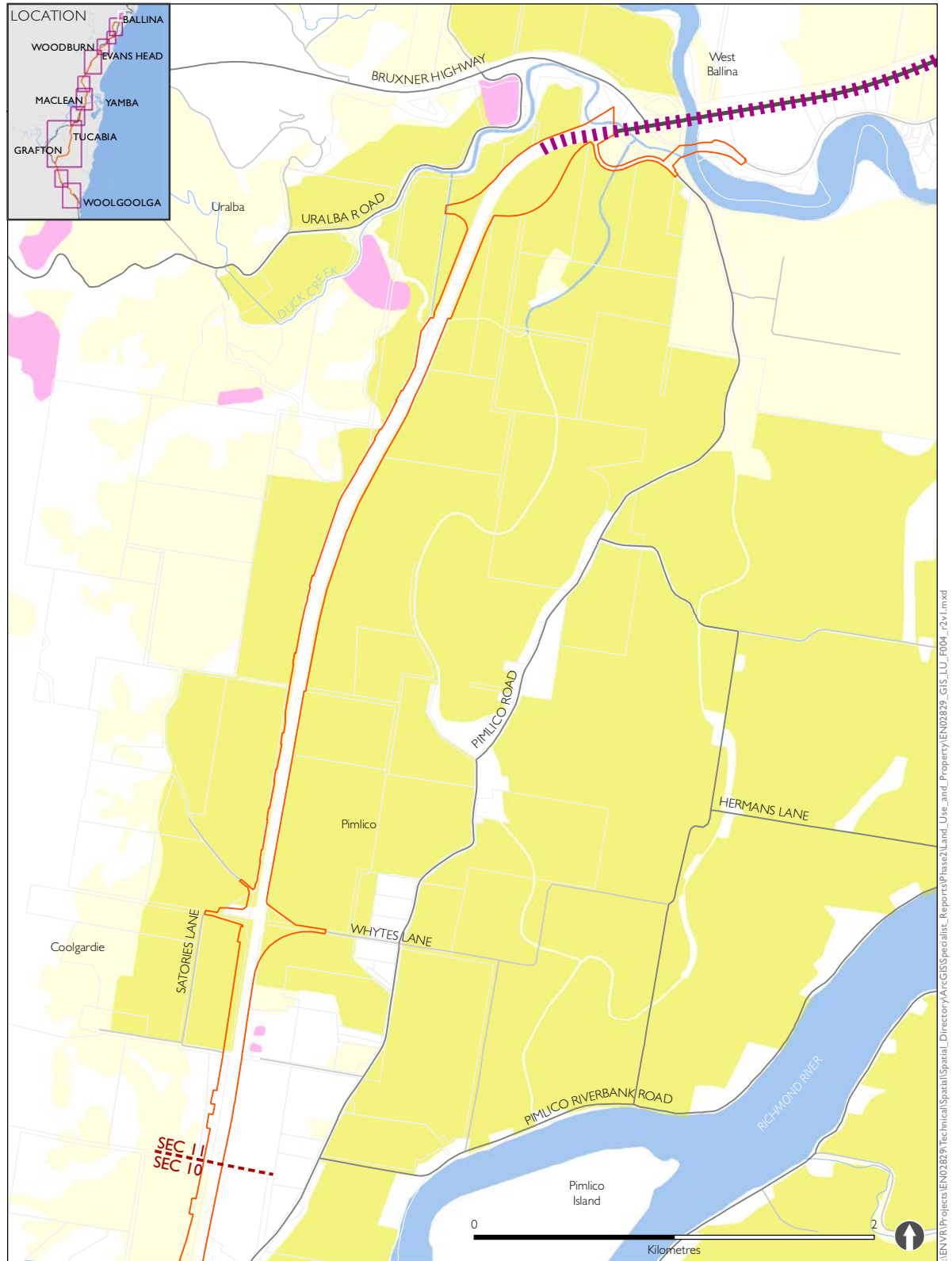
- The project
- Upgrade completed to dual carriageway
- Upgrade under construction
- Existing Pacific Highway
- Grazing
- Cropping
- Horticulture

Figure 3-2j Affected agricultural land uses



- The project
- Upgrade completed to dual carriageway
- Upgrade under construction
- Existing Pacific Highway
- Grazing
- Cropping
- Horticulture

Figure 3-2k Affected agricultural land uses



- The project
- Upgrade completed to dual carriageway
- Upgrade under construction
- Existing Pacific Highway
- Grazing
- Cropping
- Horticulture

### 3.4.3. Grazing land

Land identified for grazing is mainly located in the southern part of the Clarence Valley local government area surrounding the urban centre of Grafton, and the northern part of the Coffs Harbour local government area. However, areas of grazing land are also scattered near the project in the Richmond Valley and Ballina local government areas.

Overall, grazing land is scattered along the length of the project, with particular concentrations of grazing land near the project:

- West of Corindi Beach and south of Corindi (Section 1)
- West of the existing Pacific Highway at Halfway Creek (Section 2)
- East of the existing Pacific Highway between Glenugie and Tyndale (Section 3)
- East of Maclean (Section 4)
- Near the towns of Woodburn and Broadwater, particularly west of the Richmond River (Section 8 and Section 9)
- West of the existing Pacific Highway in the Ballina local government area (Section 11).

### Flood refuge

A land status application was made to the Crown Lands Division within the NSW Department of Primary Industries. The investigations identified three properties used for stock refuges in times of flood. These include:

- Mitchell Hill refuge, located north of and adjacent to Mitchell Road. This is used as a refuge for stock during regional (Clarence River) flood events
- Two properties at Tyndale, located immediately south-east of the confluence of Coldstream River and the Clarence River South Arm. These are used as a refuge for stock during regional (Clarence River) flood events.

### 3.4.4. Horticultural land

Land used for horticultural uses are located within the Coffs Harbour local government area west of Corindi and Halfway Creek, and in the Ballina local government area surrounding Alstonville. Horticultural uses mainly comprise a mix of tree fruits, banana plantations, vegetables, vine fruits, and nuts.

In particular, land near the project used for horticulture is located:

- West of the existing Pacific Highway at Corindi Beach, and west of Corindi and south of Dirty Creek (Section 1)
- West of the existing Pacific Highway at Halfway Creek (Section 2)
- Between Glenugie and Tucabia, adjacent to the realigned Pacific Highway (Section 3)

- East of Woodburn, and north of the Woodburn Evans Head Road (Section 8)
- Adjacent to the existing Pacific Highway, north of Woodburn (Section 9)
- West of the existing Pacific Highway between Wardell and Teven Junction (Section 11).

The location of horticultural land near to the project is shown in Figure 3-2a – 3-2k.

#### **3.4.5. Agricultural infrastructure**

A range of infrastructure supporting agricultural uses exists within the study area including irrigation infrastructure, sugar cane drains, and associated farm infrastructure such as dams, sheds, fencing and cane pads. The majority of agricultural infrastructure exists on privately owned land used for cropping, horticulture and grazing and rural residential uses.

The project would pass under a conveyor used by the sugar mill at Broadwater (owned by the NSW Sugar Milling Co-operative Ltd). An overhead protection structure would be required where the conveyor passes over the proposed upgrade.

#### **3.4.6. Agricultural diseases and quarantined properties**

There are no quarantined properties near to the project.

A number of properties and horses in north-eastern NSW were affected with the Hendra virus in 2011. These were located at Wollongbar, Macksville, Lismore, Mullumbimby and Ballina. Quarantines on these properties were lifted in January 2012. No further cases have occurred in NSW since September 2011.

#### **3.4.7. Travelling stock reserves**

Travelling stock reserves are Crown reserves historically formed to provide for the movement of livestock. Travelling stock reserves are generally managed under trust by the Livestock Health and Pest Authority (formerly Rural Lands Protection Boards), although some have been handed back to Crown Lands since January 2009.

A land status application was made to the Crown Lands Division within the NSW Department of Primary Industries. The investigations identified properties managed by the Livestock Health and Pest Authority at Woodburn for camping, travelling stock and a property at Halfway Creek for camping. A full list of properties identified is provided in Table 3-2.

### **3.5. Commercial fishing and aquaculture**

A number of commercial fisheries are located off the eastern coastline and in the major North Coast estuaries, including the Clarence River, which is the largest estuary on the east coast.

The Clarence River and Lake Wooloweyah form part of the Clarence River estuary prawn trawl fishery. The Clarence River is the most productive of the four estuaries in NSW in which prawn trawling is permitted, with the river producing around 300 tonne of product annually valued at approximately \$2 million. About 110 fishing businesses are authorised to operate in the Clarence

River prawn trawl fishery, with about 60 businesses actively operating. Prawn trawling occurs in Lake Wooloweyah between October and May and in the Clarence River in early December (DPI, 2006).

Seafood harvested in the Clarence River prawn trawl fishery is mainly school prawns with these making up around 95 per cent of the total catch. Juvenile school prawns spend a large amount of their time in the upper reaches of the Clarence River and migrate to the lower reaches and ocean waters during the warmer months or during times of high river discharge. Good water quality and habitat protection are important to the sustainability of prawn stocks. The bulk of the school prawns harvested from the Clarence River is packaged for bait, and the remainder sold for human consumption through regional and Sydney fish markets. Current trends impacting the prawn trawl fishery include rising costs, low catch rates and cheaper imported product (DPI, 2006).

The Clarence and Richmond rivers are within the estuary general fishery, which includes all forms of estuary fishing other than prawn trawling. Up to 87 species are caught across this fishery. The Clarence River produces the highest commercial eel catch, with the use of eel traps peaking during winter (NSW Fisheries, 2001; DPI, 2006).

The *NSW Oyster Industry Sustainable Aquaculture Strategy* (Department of Primary Industries 2006) establishes a set of water quality guidelines, flow objectives and management measures for the healthy growth of oysters that are safe for human consumption. The strategy identifies the locations of priority oyster areas within the wider region, including in the Clarence, Richmond, Manning, Camden Haven, Hastings, Macleay, Nambucca, Bellinger, Wooli, and Sandon rivers.

There are no oyster priority areas located near to the project. However, within the Clarence River, priority oyster aquaculture areas are located near the mouth of the Clarence River at Yamba. In the Richmond River, priority oyster aquaculture areas are located near the mouth of the Richmond River and in North Creek at Ballina (NSW Department of Primary Industries 2006).

## 3.6. Conservation

A large part of the study area comprises conservation land uses including national parks and reserves, conservation areas, wetlands, and tree and shrub cover. The majority of conservation land uses are located within and adjoining national parks and State forests. Many conservation land uses overlap with other similar land uses as these areas are identified primarily as areas of high environmental value.

### 3.6.1. National parks, State conservation areas and nature reserves

The Yaegl Nature Reserve and Broadwater National Park would be directly affected by the project. A number of national parks, State conservation areas and nature reserves are also located near the project. These include:

- Yuraygir State Conservation Area and Yuraygir National Park, which extends from east of the Pacific Highway near Halfway Creek to the coast and along the coast from Red Rock in the south to Angourie in the north. A small section of the Pacific Highway is located adjacent to the conservation area south of Halfway Creek, although this section has previously been upgraded to dual carriageway

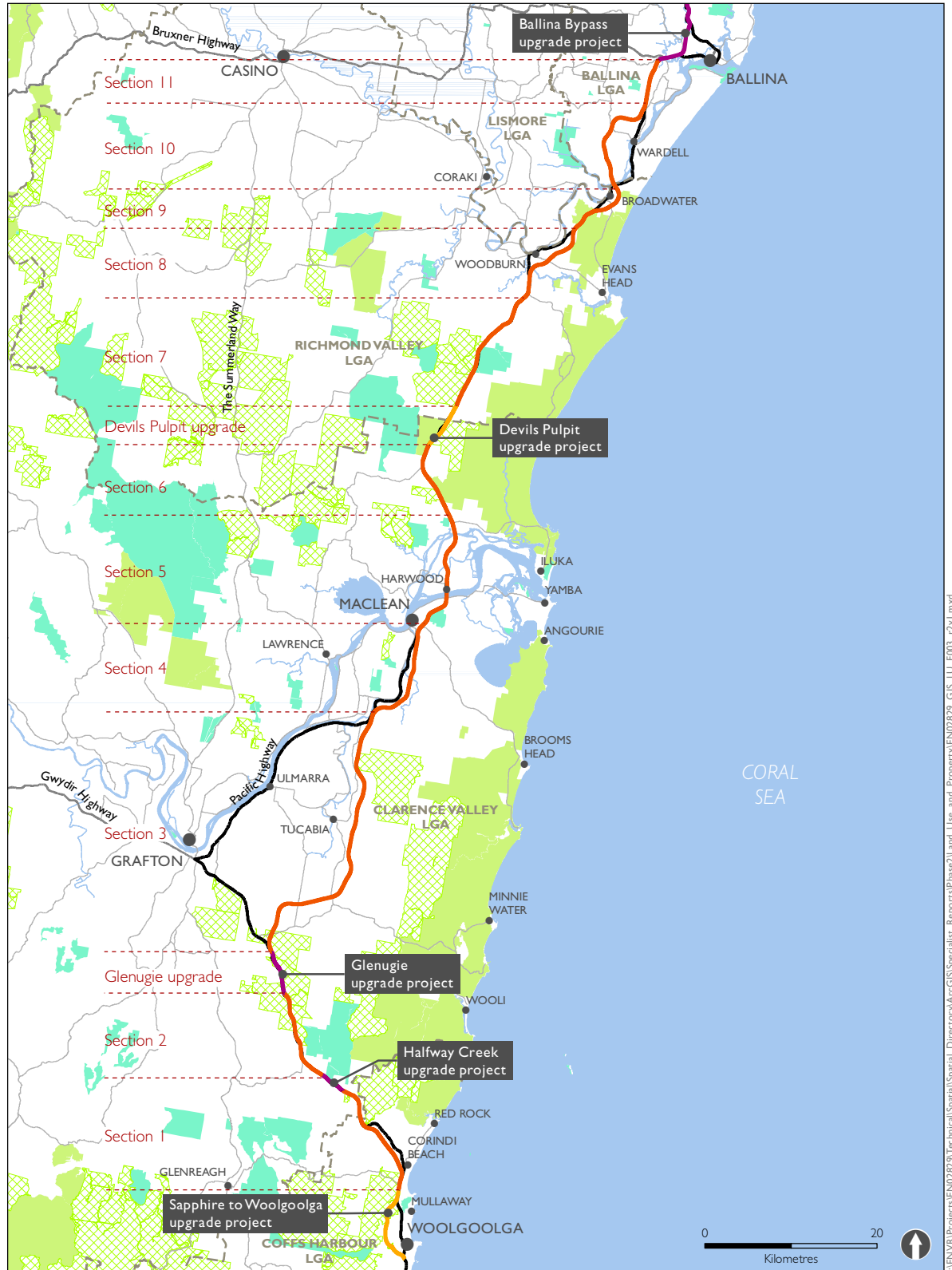
- Yaegl Nature Reserve, located mainly east of the existing Pacific Highway north of Townsend, near Maclean (Section 5). A small part of the nature reserve also extends west of the highway. The existing Pacific Highway forms the north-west boundary of the nature reserve
- Mororo Creek Nature Reserve, located west of the existing Pacific Highway near the proposed interchange at Iluka Road (Section 5)
- Bundjalung National Park, which extends east of the existing Pacific Highway near Mororo to the Coast, and along the coast from Iluka in the south to Evans Head in the north. The Pacific Highway is located adjacent to about three kilometres of the park's western boundary, north of Mororo (Section 6)
- Bundjalung State Conservation Area located west of the existing Pacific Highway, north of the proposed interchange at Iluka Road. The Pacific Highway forms the eastern boundary of the conservation area (Section 6)
- Tabbimoble Swamp Nature Reserve, located east of the existing Pacific Highway, north of Tabbimoble. The Pacific Highway forms the western boundary of the nature reserve (Section 7)
- Broadwater National Park mainly extends east from the Pacific Highway south of Broadwater to the coast and from Evans Head in the south to Broadwater in the north (Section 8 and Section 9). A section of the national park is also located west of the Pacific Highway near Rileys Hill. The project is located adjacent to a section of the national park east of Broadwater
- Uralba Nature Reserve, which is located west of the project, north of the proposed interchange at Wardell (Section 11).

The location of national parks, conservation areas and nature reserves affected by, or located near the project are shown in Figure 3-3.

The national parks provide environmental and conservation values, which each offer a range of activities such as picnicking, walking and cycling trails and camping.

Revocation of land reserved under the *National Parks and Wildlife Act 1974* would be required before that land could form part of the future road reserve.

Figure 3-3 National parks, conservation areas and state forests



- The project
- Upgrade completed to dual carriageway
- Upgrade under construction
- Existing Pacific Highway
- National park
- Nature reserve / state conservation area
- State forest



### **3.6.2. Wetlands, tree and shrub cover**

Areas of wetland, tree and shrub cover are scattered across the study area.

The main areas of wetland near the project are located:

- West of the project, south of Tucabia and east of the project, south of Tyndale (Section 3)
- East of the project and south of Brooms Head Road near Maclean, and south of the Richmond River, near the Yamba Road interchange (Section 5)
- West of the existing Pacific Highway, between New Italy and Woodburn, and south-east of the project at Woodburn, near to the Evans River (Section 8)
- North of the Richmond River, south of Old Bagotville Road (Section 10).

The project passes through or near areas identified as tree and shrub cover. Many of these areas adjoin national parks, nature reserves and State forests. The main areas of tree and shrub cover are:

- Within the northern part of the Coffs Harbour local government area and southern part of the Clarence Valley local government area, between Corindi and the Glenugie State Forest (Section 1 and Section 2)
- East of the project, between the proposed interchange at Glenugie and Maclean (Section 3 and Section 4)
- Within the northern part of the Clarence Valley local government area, north of the proposed interchange at Iluka Road (Section 6)
- Within the Richmond Valley local government area, south of Woodburn (Section 7 and Section 8)
- North of the Richmond River, west of Wardell (Section 10).

## **3.7. Natural resources**

The north coast region of NSW supports a wide range of primary industries, including agriculture, forestry, mining, and commercial and recreational fishing.

This section provides an overview of natural resources in the study area, including land used for State forests, mineral and petroleum production and extractive industries. A description of existing agricultural and commercial fishing uses is provided in Section 3.4 and Section 3.5 respectively.

### 3.7.1. State forests

State forests within the study area are shown on Figure 3-3. The project would affect part of the Wells Crossing Flora Reserve, which forms part of the Newfoundland State Forest. Other State forests located near the project include:

- Wedding Bells State Forest, west of Arrawarra (Section 1)
- Newfoundland State Forest, located east of the project and north of the proposed interchange at Range Road. A small section of the State forest is also located west of the existing Pacific Highway near Milleara (Section 1) and east of the existing Pacific Highway, north of Halfway Creek (Section 2)
- Glenugie State Forest, located either side of the existing Pacific Highway, generally between Halfway Creek and the proposed interchange at Eight Mile Lane (Section 2 and part Section 3)
- Pine Brush State Forest, located east of the project, south of the proposed interchange at Tyndale (Section 3)
- Mororo State Forest, located west of the existing Pacific Highway at Mororo (Section 6)
- Devils Pulpit State Forest, located east of the existing Pacific Highway north of Mororo. This section forms part of the existing Devils Pulpit upgrade project
- Tabbimoble State Forest and Doubleduke State Forest, located west of the existing Pacific Highway at Tabbimoble (Section 7).

State forests near the project are mostly characterised by dry open forests of Blackbutt, Mahogany, Spotted Gum and Ironbark, with limited low-lying areas comprising Paperbark or Forest Red Gum.

The State forests are production forests that are managed for multiple purposes including timber production, conservation, recreation and grazing under lease or occupation permit.

Each State forest is classified into one of eight forest management zones. These set out the way Forests NSW intends to manage forest areas and differentiate between those areas of State forests which are set aside for conservation and those areas that are available for other activities including timber harvesting. Forest management zones near the project include:

- Zone 1 – Special protection – management to maximise protection of very high natural and cultural conservation values. An example of land with this zone is the Wells Crossing Flora Reserve which has protection under s25 of the *Forestry Act 1916*
- Zone 3 – Harvesting exclusions and special prescription – management for conservation of identified values and/or forest ecosystems and their natural processes, in either zone 3a (harvesting exclusions) or zone 3b (special prescription). Land in zone 3a has protection under s21 of the *Forestry Act 1916*

- Zone 4 – General management – management of native forests for timber production utilising the full range of sivicultural options as appropriate, and conservation of broad area habitat and environmental values, which are not dependent on the structure of the forest
- Zone 7 – Non-forestry use – management of cleared (non-forested) areas, such as those used for special developments
- Zone 8 – Areas for further assessment – an interim zoning of areas where field investigation is required to determine final forest management zone classification.

### 3.7.2. Mineral and petroleum production

The project is in the Clarence-Moreton Basin, which extends onshore from north-eastern NSW to southern Queensland, as well as offshore across the adjacent continental shelf. Within northern NSW, the basin covers approximately 16,000 square kilometres, extending south from the border of NSW and Queensland to Woolgoolga and from the coast, west of Grafton and Casino ([www.resources.nsw.gov.au](http://www.resources.nsw.gov.au)).

A number of existing mining and petroleum leases and licences are traversed by the project. The petroleum licences relate to coal seam gas exploration. These are listed in Table 3-1.

**Table 3-1 Mining and petroleum leases and licences**

Company	Petroleum or mineral	Licence/ lease type	Reference number	Grant date	Due expiry
BNG Pty Ltd	Petroleum	Petroleum exploration licence	PEL445	19 April 2004	18 April 2013
Tironz Pty Ltd	Mineral	Exploration licence	EL7624	29 September 2010	29 September 2012
Tironz Pty Ltd	Mineral	Exploration licence	EL6570	8 June 2006	7 June 2012
Clarence Moreton Resources Pty Ltd	Petroleum	Petroleum exploration licence	PEL457	30 April 2008	20 April 2011
Metgasco Ltd	Petroleum	Petroleum exploration licence	PEL426	21 April 1998	19 February 2014
New Italy Resources Pty Ltd	Mineral	Exploration licence	EL7716	28 February 2011	28 February 2013

Source: NSW Government Department of Trade and Investment, Regional Infrastructure and Services

A number of applications have also been made over parts of the study area for mining and petroleum exploration.

### 3.7.3. Extractive industries

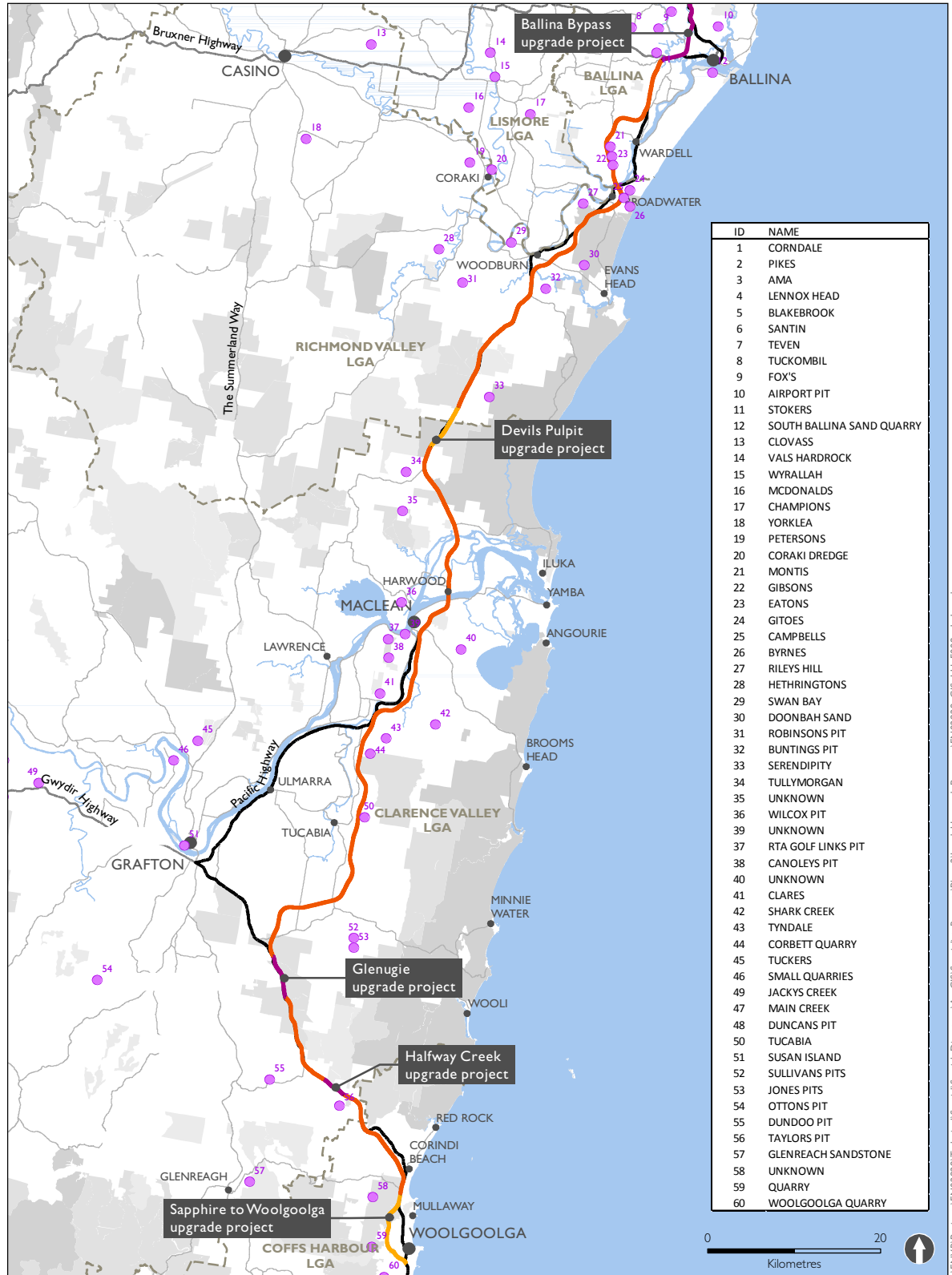
A number of existing quarry operations are located across the wider region. These comprise a range of materials, including:

- Sandstone, particularly in the central part of the study area between Pillar Valley and Tabbimoble
- Ironstone and ridge gravel, west of Grafton in the central part of the study area
- Chert, particularly east of Broadwater in the northern part of the study area
- Sand, including barrier sand and coastal sand, in the northern part of the study area near Woodburn, Wardell and Ballina
- Basalt, particularly in that area north west of Ballina
- Argillite, particularly in the southern part of the study area near Woolgoolga and Coffs Harbour and near Teven in the northern part of the study area.

Figure 4-1 shows the locations of quarries across the wider region. There are a number of properties currently used for quarrying activities located within about one kilometre of the project. The location of natural resources near the project, including properties used for quarries, is shown in Figure 3-5a to Figure 3-5k.

Seven parcels of land used and available for quarrying are located within the project boundary, around Tucabia, Broadwater and Bagotville.

Figure 3-4 Regional quarry locations

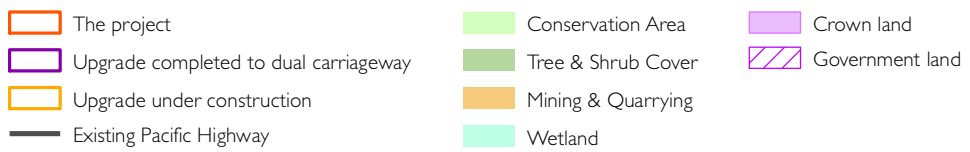
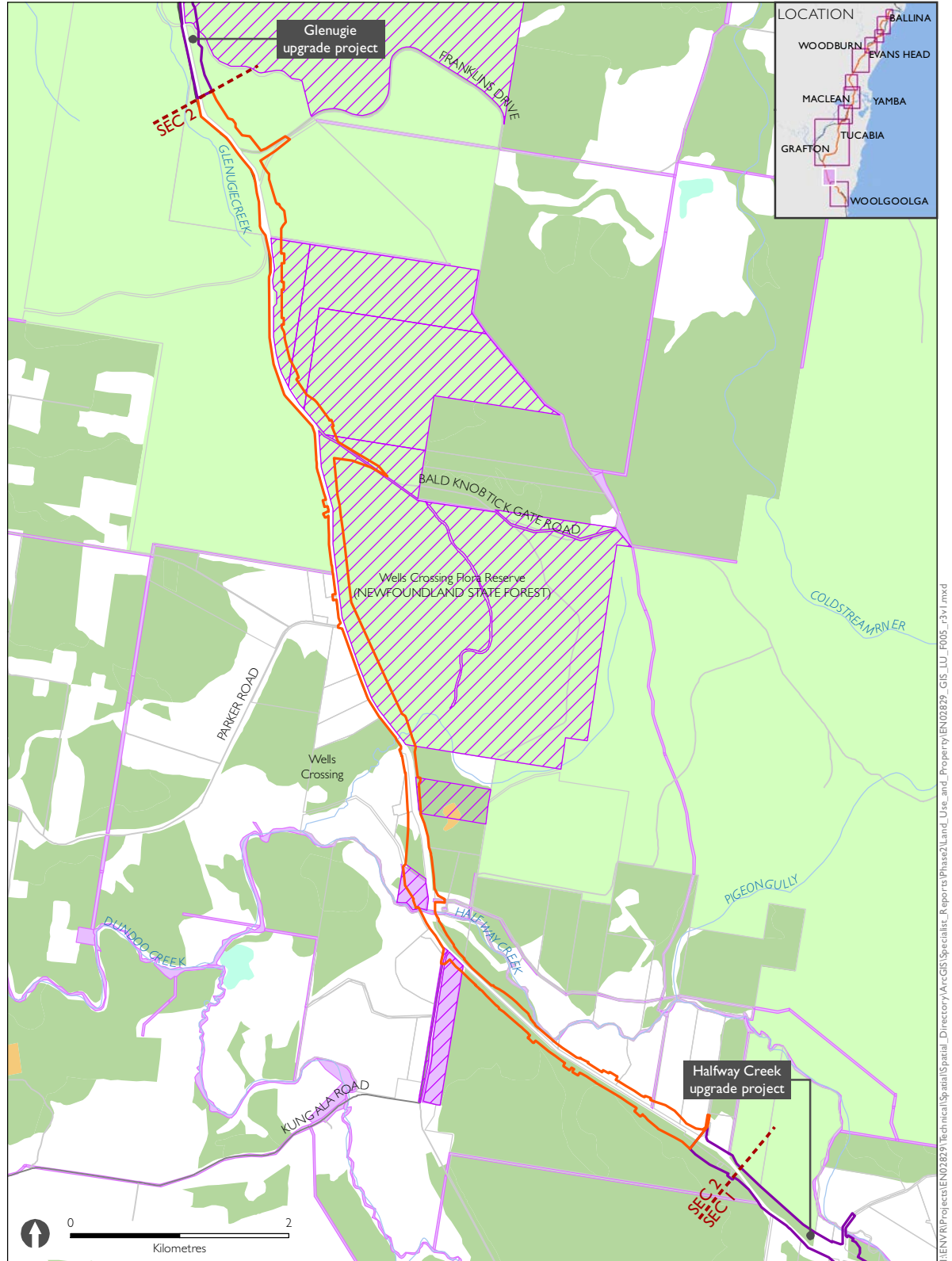


- The project
- Upgrade completed to dual carriageway
- Upgrade under construction
- Existing Pacific Highway
- Quarry locations

Figure 3-5a Natural resource land uses and government owned land



Figure 3-5b Natural resource land uses and government owned land



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Figure 3-5c Natural resource land uses and government owned land

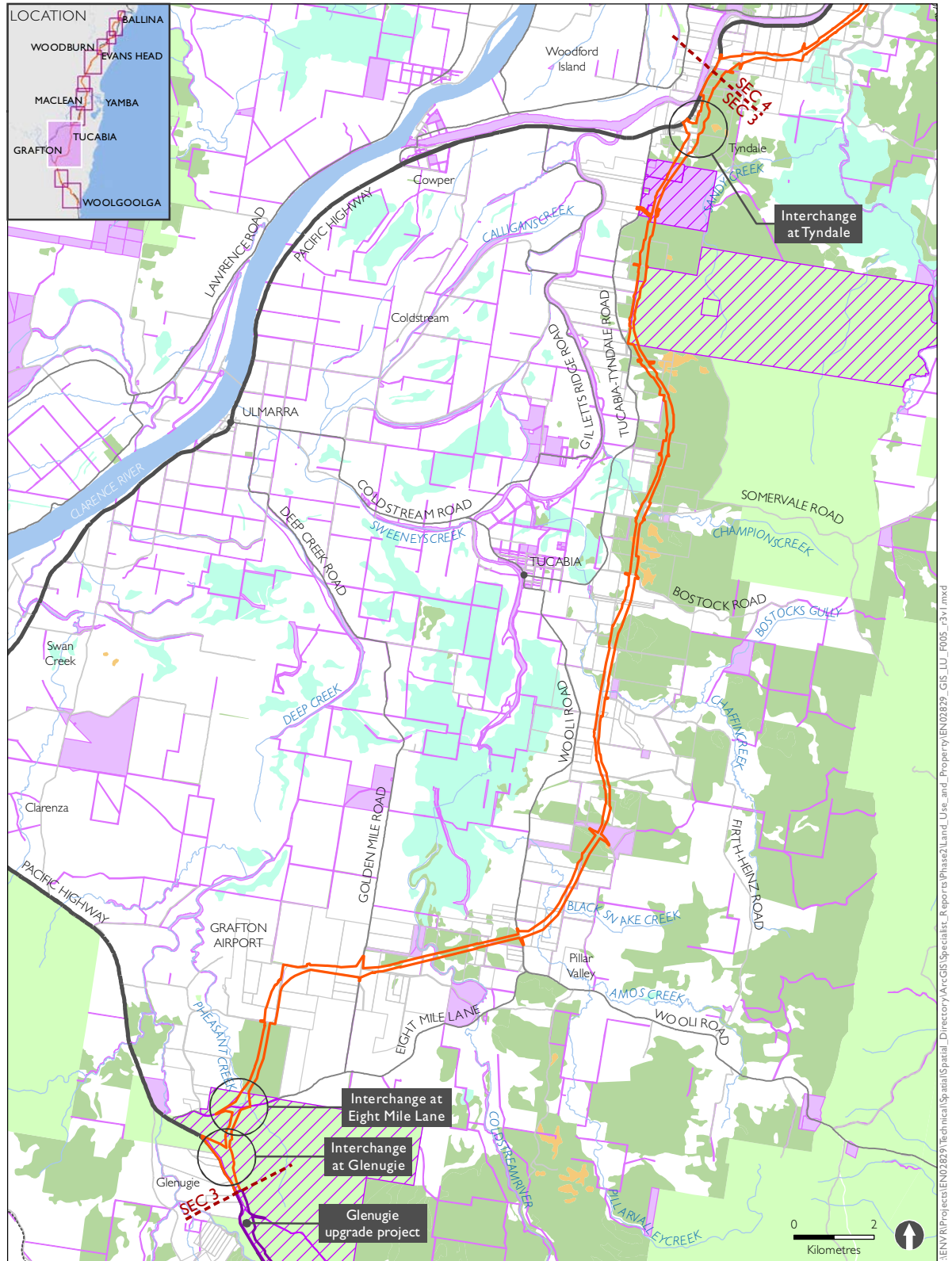
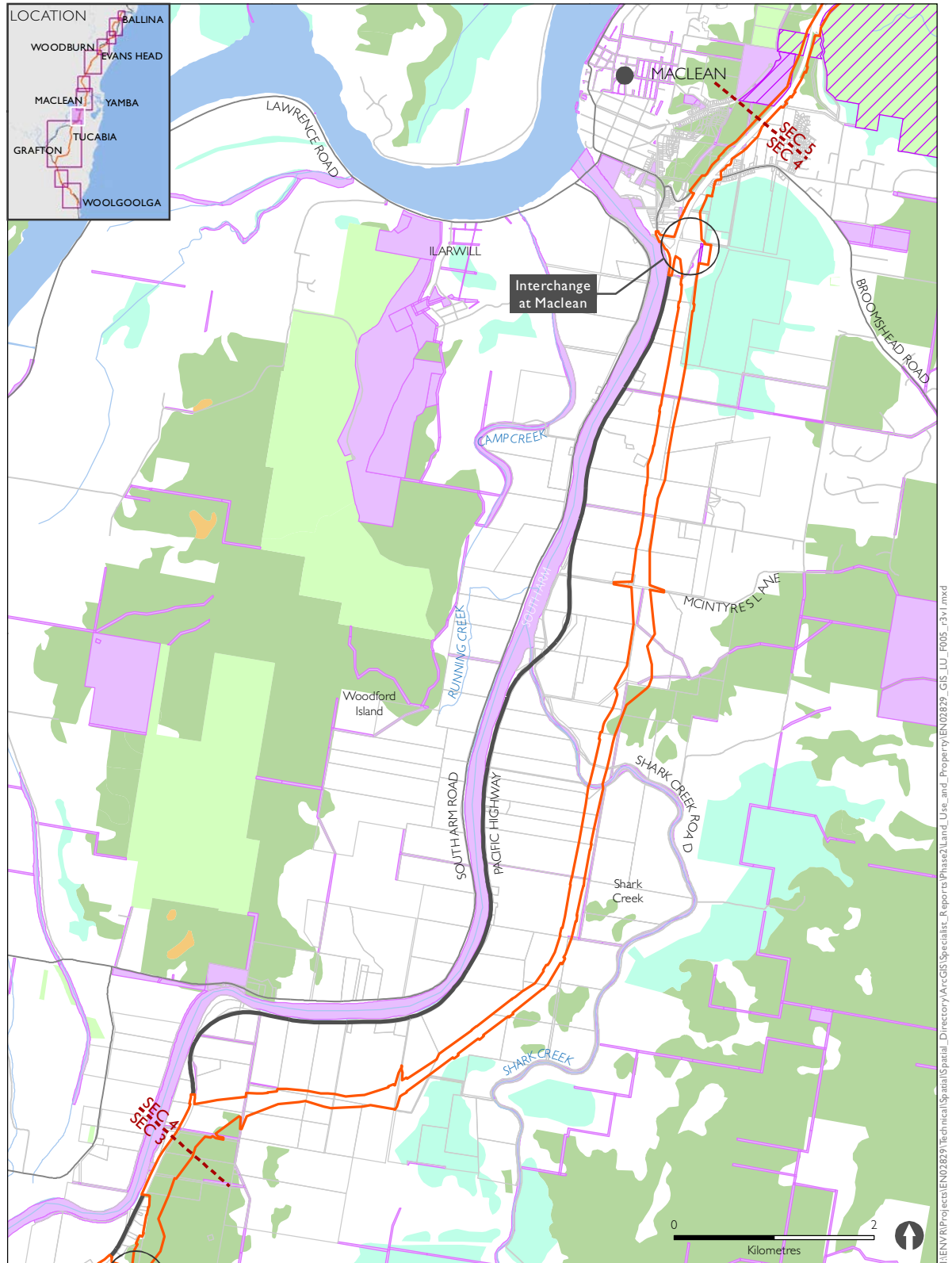


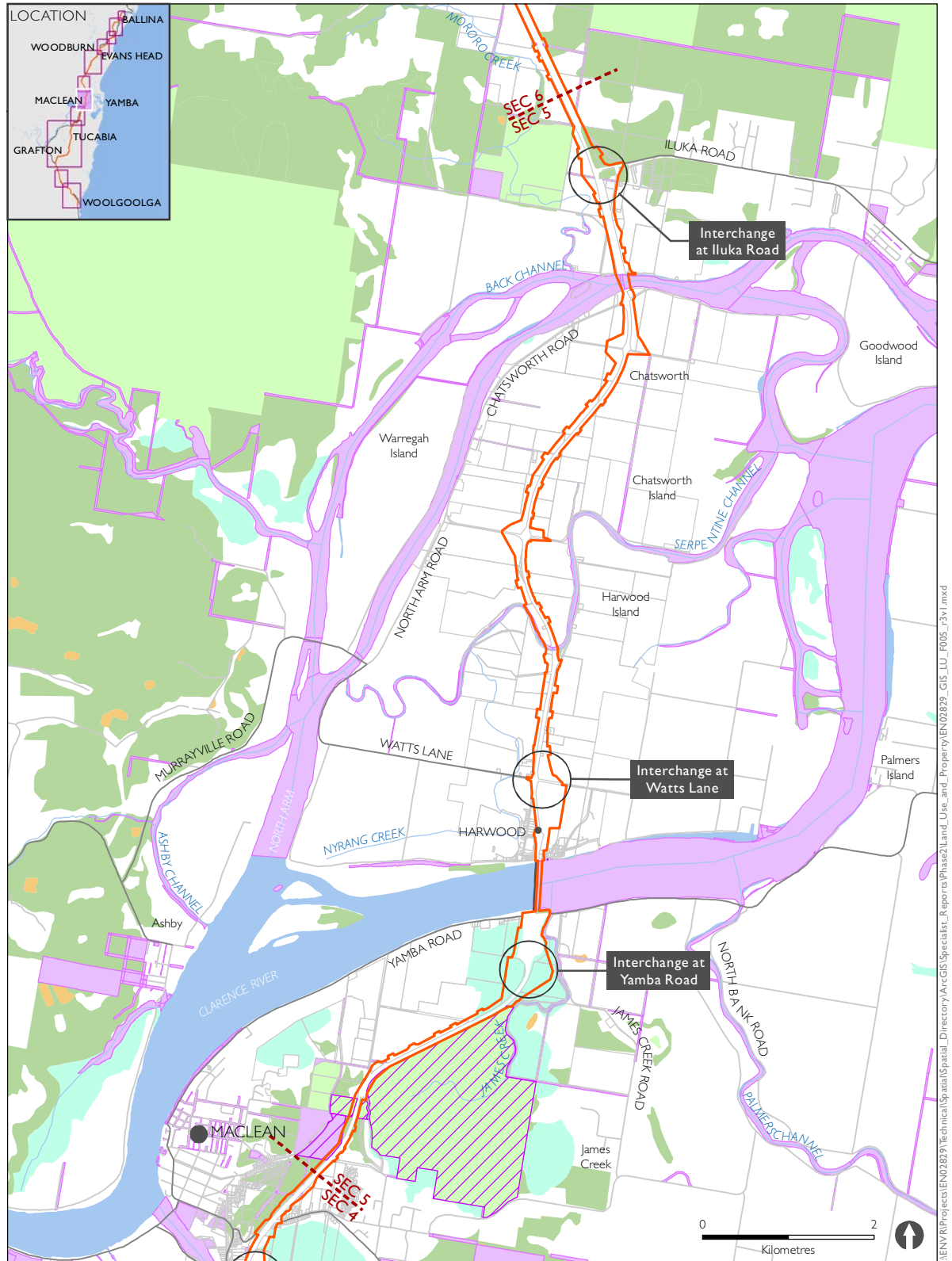


Figure 3-5d Natural resource land uses and government owned land



- |                                       |                    |                 |
|---------------------------------------|--------------------|-----------------|
| The project                           | Conservation Area  | Crown land      |
| Upgrade completed to dual carriageway | Tree & Shrub Cover | Government land |
| Upgrade under construction            | Mining & Quarrying |                 |
| Existing Pacific Highway              | Wetland            |                 |

Figure 3-5e Natural resource land uses and government owned land



- |                                       |                    |                 |
|---------------------------------------|--------------------|-----------------|
| The project                           | Conservation Area  | Crown land      |
| Upgrade completed to dual carriageway | Tree & Shrub Cover | Government land |
| Upgrade under construction            | Mining & Quarrying |                 |
| Existing Pacific Highway              | Wetland            |                 |

Upgrading the Pacific Highway - Woolgoolga to Ballina Upgrade

Figure 3-5f Natural resource land uses and government owned land

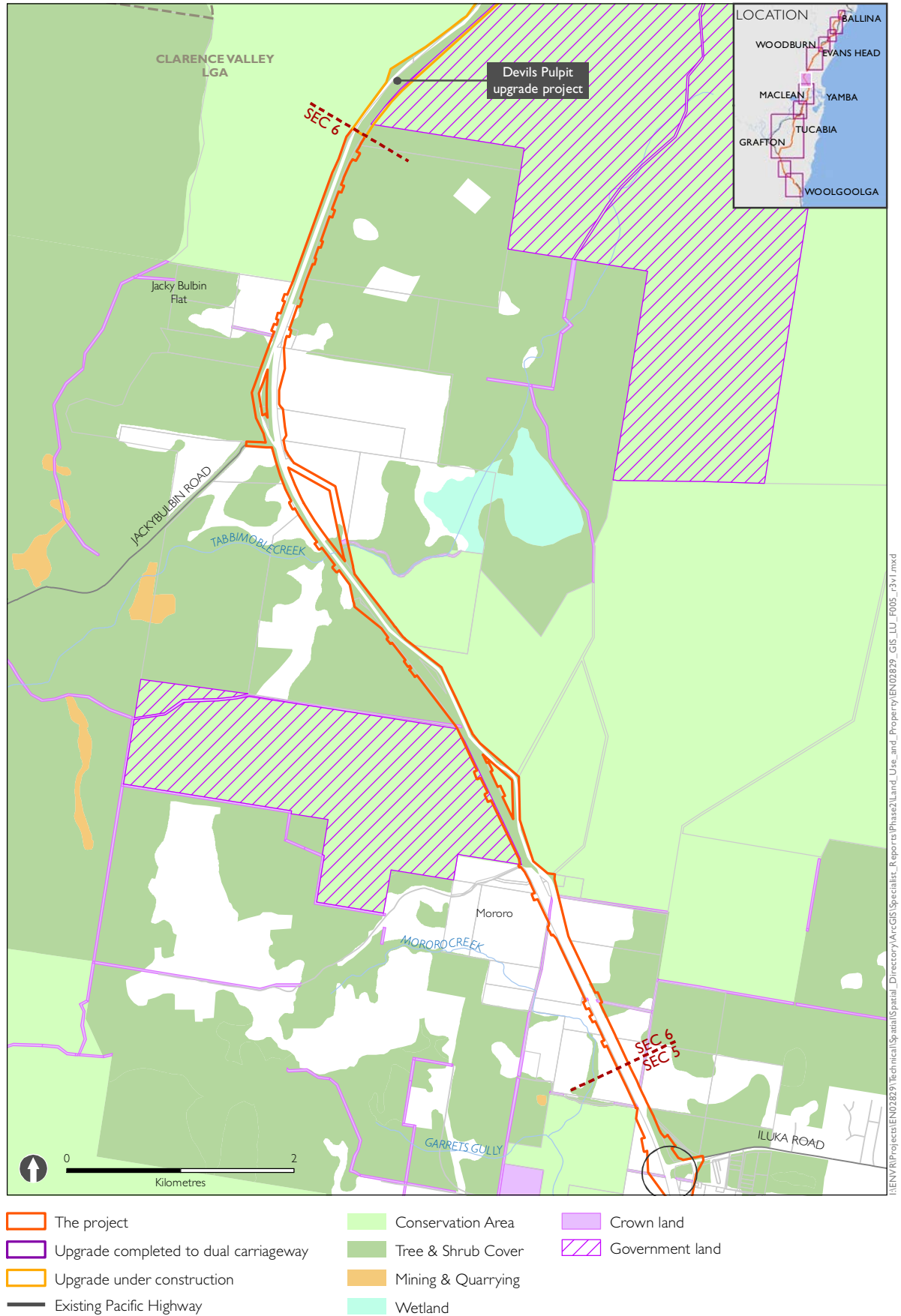


Figure 3-5g Natural resource land uses and government owned land

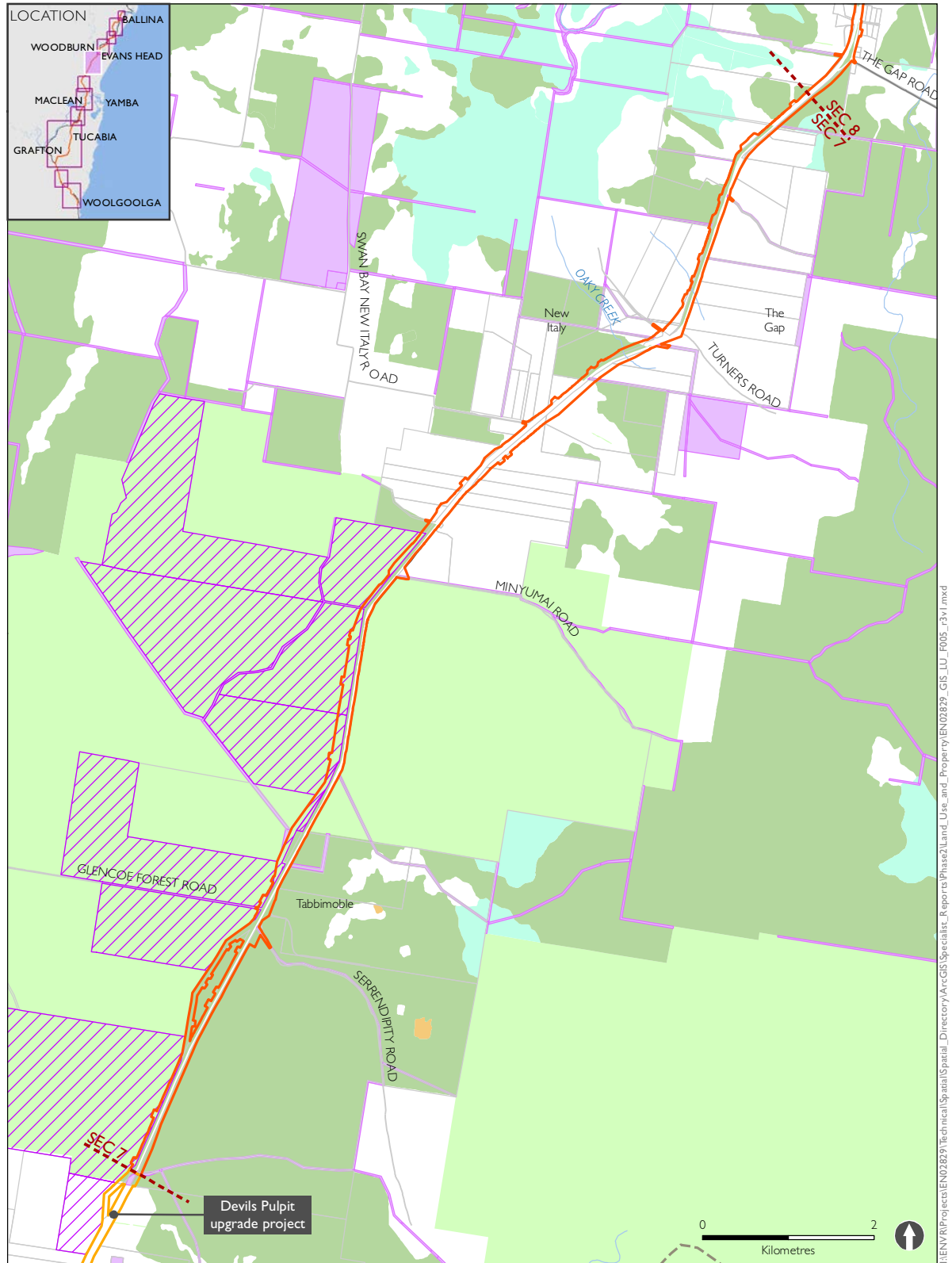
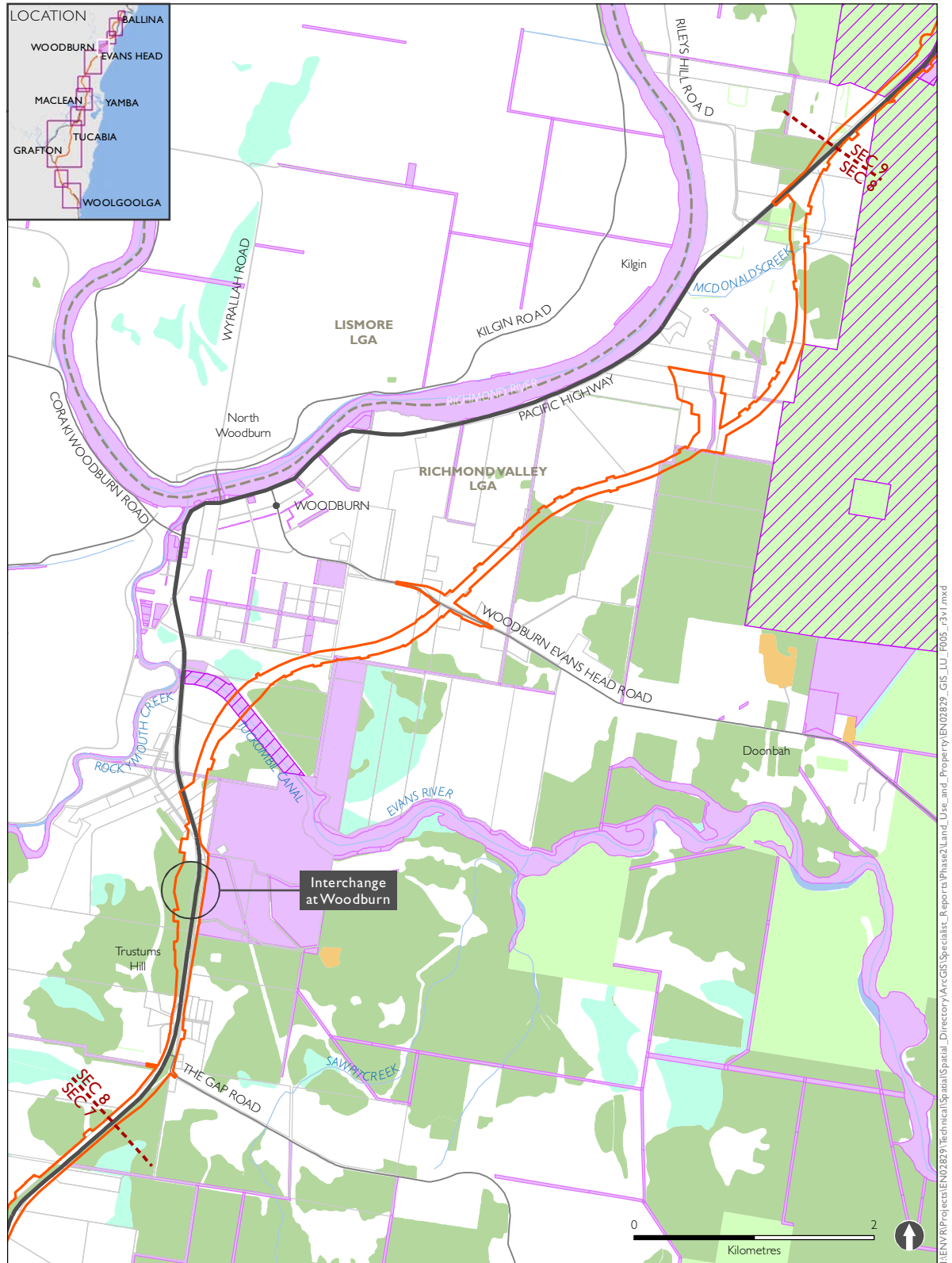
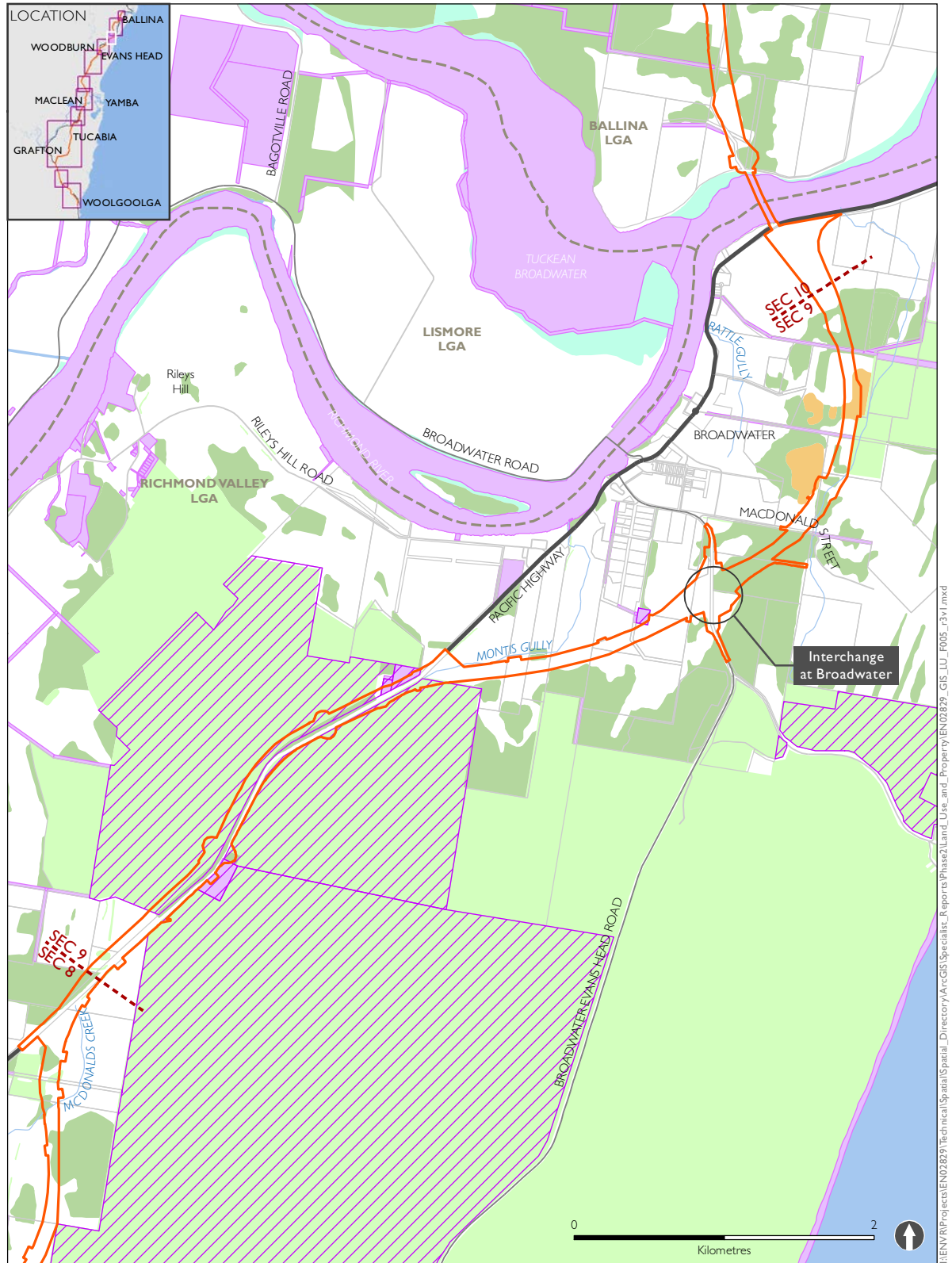


Figure 3-5h Natural resource land uses and government owned land



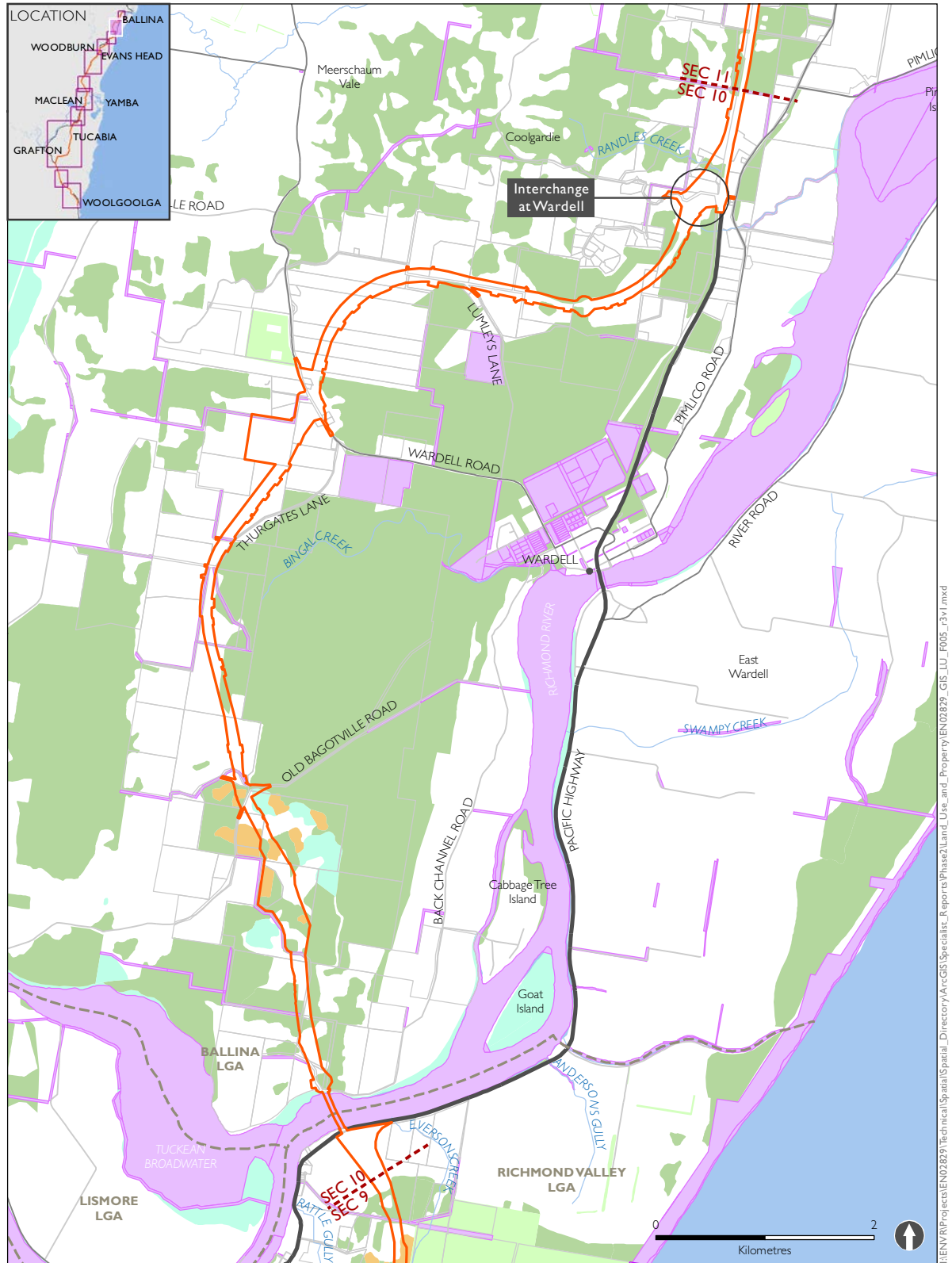
- |                                       |                    |                 |
|---------------------------------------|--------------------|-----------------|
| The project                           | Conservation Area  | Crown land      |
| Upgrade completed to dual carriageway | Tree & Shrub Cover | Government land |
| Upgrade under construction            | Mining & Quarrying |                 |
| Existing Pacific Highway              | Wetland            |                 |

Figure 3-5i Natural resource land uses and government owned land



- |                                       |                    |                 |
|---------------------------------------|--------------------|-----------------|
| The project                           | Conservation Area  | Crown land      |
| Upgrade completed to dual carriageway | Tree & Shrub Cover | Government land |
| Upgrade under construction            | Mining & Quarrying |                 |
| Existing Pacific Highway              | Wetland            |                 |

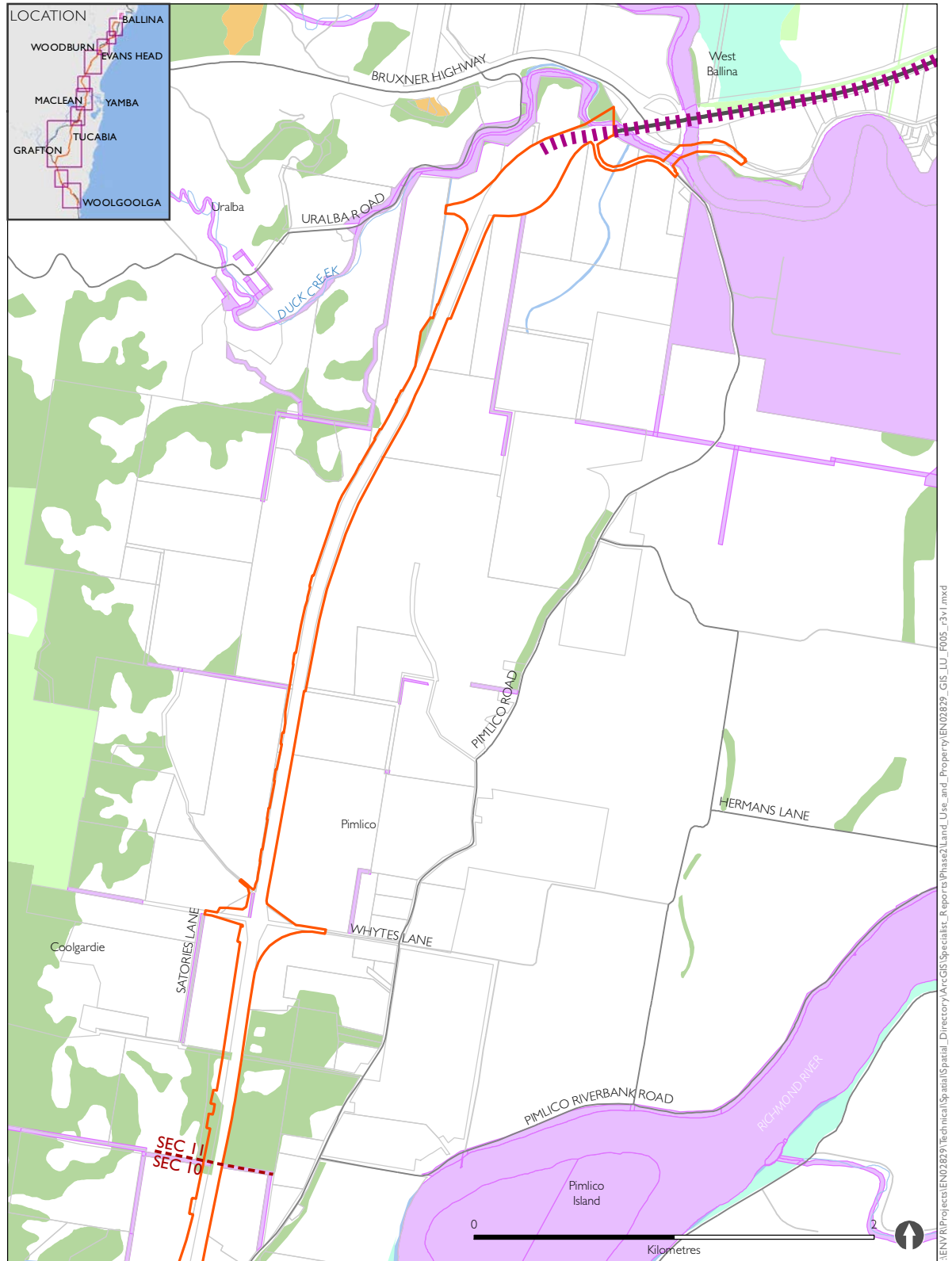
Figure 3-5j Natural resource land uses and government owned land



- |                                       |                    |                 |
|---------------------------------------|--------------------|-----------------|
| The project                           | Conservation Area  | Crown land      |
| Upgrade completed to dual carriageway | Tree & Shrub Cover | Government land |
| Upgrade under construction            | Mining & Quarrying |                 |
| Existing Pacific Highway              | Wetland            |                 |

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Figure 3-5k Natural resource land uses and government owned land



- |                                       |                    |                 |
|---------------------------------------|--------------------|-----------------|
| The project                           | Conservation Area  | Crown land      |
| Upgrade completed to dual carriageway | Tree & Shrub Cover | Government land |
| Upgrade under construction            | Mining & Quarrying |                 |
| Existing Pacific Highway              | Wetland            |                 |



### 3.8. Infrastructure and utilities

The study area includes a range of major infrastructure and utilities, including:

- Road corridors, such as the existing Pacific Highway and local road network
- Electricity, including Essential Energy low and high voltage transmission networks
- Telecommunications network, including both copper and optic fibre cables
- Sewer and water supplies managed by the Coffs Harbour, Clarence Valley, Richmond Valley and Ballina local government areas and Rous Water
- Land proposed for utilities including sewerage, off Broadwater-Evans Head road.

The existing road network within the study area includes a range of road types. The Pacific Highway provides access to regional centres and towns as well as local villages across the study area and nearby regions. Sections of the Pacific Highway also provide direct access to properties located next to the highway, including those used for residential uses, agriculture, commercial uses, and State forests, national parks and conservation areas. The local road network within the study area is maintained by local councils including Coffs Harbour, Clarence Valley, Richmond Valley and Ballina.

The study area includes an extensive network of overhead transmission lines managed by Essential Energy, including 11kV, 33kV and 66kV electricity distribution lines.

The existing Telstra cable network includes underground coaxial/ copper cable and optic fibre cable. This includes the main optic fibre cable linking Brisbane and Sydney.

Sewer and water facilities, including mains and pumping stations are managed by each of the Councils through which the project passes. There are no gas utility assets located near the project.

Rous Water Authority also manages water mains within the study area. The Rous Water borefield is located east of Woodburn within Section 8 of the project (around STN 132.0). The project would cross the borefield on a fill embankment.

## 3.9. Land tenure

The majority of land within the study corridor is held in freehold title. This includes properties held in freehold by RMS or various State Government departments. Freehold land required for the Project would be acquired in accordance with the provisions of the *Land Acquisition (Just Terms Compensation) Act 1991*.

### 3.9.1. Crown land

The study area comprises areas identified as Crown land, including reserves, waterways and public roads. The management of Crown land in NSW is the responsibility of the Crown Lands Division within the NSW Department of Primary Industries. In certain instances, reserve land is managed under Trust.

Crown waterways are defined as navigable waters. A road authority may construct bridges and tunnels across navigable waters, in accordance with the *Roads Act 1993*. The Minister may open roads over unoccupied Crown land in accordance with the *Roads Act 1993*.

RMS would undertake consultation regarding any affected Crown public roads held and not held under enclosure permits.

A land status application was made to the Crown Lands Division within the NSW Department of Primary Industries. The investigations identified 21 areas of Crown land located near the project, as listed in Table 3-2. Some areas identified included multiple individual properties. Government owned land near the project, including land held in freehold by government agencies, is also shown in Figure 3-5a to Figure 3-5k.

**Table 3-2 Crown land near the project**

Property ID	Lot/DP	Location	Status	Manager
30063	Lot 7008, DP92609	Broadwater	R23109 for Preservation of Graves, notified 26/10/1895. Note, Richmond Valley Council undertook a heritage study in 2007 which indicated there were no known burials, however, care should be taken when excavating in the vicinity of the cemetery in case graves are unearthed.	Department of Primary Industries and / or managed under Trust.
30274 and 30104	Lot 7011, DP1051693 and Lot 10, DP868045	Broadwater	R53201 for Rubbish Depot, notified 21/02/1919. Richmond Valley Council is the manager of this reserve. The landfill has been remediated and capped and would be considered contaminated land. For further information, see Chapter 9 of the EIS (Soils, sediments and water).	Richmond Valley Council
30073	Lot 420, DP755624	Broadwater	R68272 for Access, notified 14/04/1939. Richmond Valley Council is the manager of this	Richmond Valley Council

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Property ID	Lot/DP	Location	Status	Manager
			reserve. The reserve has historically been used as a Night Soil Depot (for disposal of sewage), however, has not been used for this purpose for around ten years. The site would be considered contaminated and appropriate management would be required should the project affect this property.	
n/a	Lot 368, DP755624	Woodburn	R54974 for Rubbish Depot, notified 18/11/1921	Department of Primary Industries and / or managed under Trust.
n/a	Lots 7099-7100, DP1113635, Lot 7101, DP1113535, Lot 7102-7104. DP1113538, Lot 7003, DP1112985	Woodburn	R52102 for Camping, Travelling Stock, notified 16/03/1917	Livestock Health and Pest Authority
n/a	Lots 7060-7061, DP1065370, Lot 7005, DP1065371	Woodburn	R47946 for Gravel Pit, notified 17/07/1912	Department of Primary Industries and / or managed under Trust.
n/a	Unsurveyed bed of Tabbimoble Creek	Mororo	Pt R56146 from Sale or Lease Generally, notified 11/05/1923	Department of Primary Industries and / or managed under Trust.
n/a	Unsurveyed bed of Clarence River	Harwood, James Creek, and Maclean	Pt R56146 from Sale or Lease Generally, notified 11/05/1923; Pt R1011268 for Future Public Requirements, notified 3/02/2006	Department of Primary Industries and / or managed under Trust.
n/a	Lots 169-170, DP751373	Harwood	R85384 for Public Recreation, notified 2/07/1965	Harwood Island (R85384) Reserve Trust; Trust Manager: Clarence Valley Council
n/a	Lot 7302, DP1141811	Harwood	Pt R751373 for Future Public Requirements, notified 29/06/2007	Department of Primary Industries and / or managed under Trust.
21411	Lot 7040,	Maclean	R83371 for Future Public	Department of Primary

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Property ID	Lot/DP	Location	Status	Manager
	DP1115009		Requirements, notified 4/08/1961	Industries and / or managed under Trust.
20708 and 20511	Lot 7001, DP92573, Pt Lot 130, DP751389	Tyndale	R36645 for Refuge in Time of Flood, notified 31/10/1903	Tyndale Flood Refuge Reserve Trust
20615	Lot 7002 DP92575	Tyndale	R97079 for Rubbish Depot, notified 9/12/1923	Department of Primary Industries and / or managed under Trust.
n/a	Lot 121, DP751378	Pillar Valley	R53804 for Refuge in Time of Flood, notified 20/02/1920	Department of Primary Industries and / or managed under Trust.
n/a	Unsurveyed	Pillar Valley	Crown public road	Subject to Enclosure Permit 33672
n/a	Lot 140, DP725857	Glenugie	Pt R751376 for Future Public Requirements, notified 29/06/2007	Department of Primary Industries and / or managed under Trust.
21191	Lot 7300, DP1144709	Halfway Creek	R46942 for Camping, notified 16/08/1911	Livestock Health and Pest Authority
n/a	Lot 37, DP751368	Halfway Creek	R63777 for Quarantine, notified 3/02/1933	Department of Primary Industries and / or managed under Trust.
n/a	Lot 133, DP1049421	Halfway Creek	R84921 for Public Recreation, notified 19/06/1964	Devolves to Clarence Valley Council under Local Government Act 1993
21373 and 21374	Lot 7004-7005, DP1058539	Halfway Creek	R140086 for Community Purposes, Environmental Protection, Public Recreation, notified 1/10/1993	Halfway Creek Community Reserve Trust
n/a	Unsurveyed bed of Corindi River	Corindi Beach	Pt R56146 from Sale or Lease Generally, notified 11/05/1923	Department of Primary Industries and / or managed under Trust.

Note: The property ID refers to the property ID shown in the list of directly affected properties included in Appendix B

## 4. Impact assessment

This section provides an assessment of impacts on land use and property for each of the land use types identified in the existing environment section.

### 4.1. Land use and property impacts

Potential land use impacts of the project on directly affected property include:

- Total or partial acquisition of directly affected properties for:
  - Road widening
  - Interchanges and related infrastructure
  - Major bridge crossings
  - Other bridges and structures, including drainage, fauna crossings and related infrastructure
  - Service roads.
- Temporary leases of land adjoining the project to provide for ancillary construction facilities, including stockpile, batching plants, compound sites and temporary construction sediment basins
- Temporary disruption to the use of land impacted by construction activities
- Change in land use to transport infrastructure, for land within the road boundary
- Change in access to properties, due to restrictions on direct property access from the highway and location of the project
- Potential severance and fragmentation of larger properties due to the location of the project
- Impacts on the current use and future development potential of partially acquired properties
- Impact on property infrastructure and structures, including farm sheds, fencing, and dams and other water infrastructure.

Potential impacts on properties near to the project include:

- Possible impacts on the future development potential of properties directly adjoining the project
- Changes to local amenity, due to increased noise and dust from construction activities, and changes to traffic noise, lighting and visual amenity during operation.

#### 4.1.1. Directly affected properties

The project would require the acquisition of a road corridor, comprising about 1,706 hectares of land. In addition, there are some properties that are only partly affected by the project that may be totally acquired by RMS through negotiation with individual property owners, due to the potential impacts on the use or function of these properties.

About 564 individual lots in deposited plans (properties) would be directly impacted by the project, either in total or in part. These properties are owned by 381 individual landowners. In many cases, a number of properties are owned by the one property owner. The majority of properties directly affected by the project comprise rural land uses, including cane farms, cropping, grazing and horticulture. Other properties directly affected by property acquisition, either totally or in part, comprise:

- Residential uses, including urban residential and rural residential uses
- Commercial uses, including caravan parks, service stations, quarries and transport depots
- Community uses, including land accommodating the New Italy Museum and community hall at Halfway Creek. For information regarding changes in access refer to Chapter 14 (Traffic and transport) and Chapter 17 (Socio-economic) of the EIS.

An assessment was undertaken of each directly affected property to determine the likely level of impact on the current or future use, functionality or viability of the property. The assessment identified:

- 311 properties as being ‘partially affected’, with part of the property required for the project. The project is not expected to have a significant effect on the functionality or viability of the current or future use of the property
- 142 properties as being ‘materially impacted’, with part of the property required for the project. The project may have a material effect on the functionality or viability of the current or future use of the property mainly due to one or more of the following:
  - More than 40 per cent of the total property area being impacted
  - A requirement to demolish a residential dwelling or major structure
  - Property severance, with no access available between either side of the project.
  - Access would need a major rework or would be unavailable.
- 111 properties are ‘totally impacted’, with the whole property required for the project. These properties are located within the road boundary.

A full list of properties directly affected by the project, including an assessment of the level of impact, is provided in Appendix A and Appendix B. These appendices include the current land uses for all of these properties. Impacts on specific land uses are described in Sections 4.3 to 4.7.

Property required for the project would be acquired by RMS. The impact of the project on each individual property would govern whether partial or total property acquisitions are undertaken. Privately owned land would be acquired in accordance with the provisions of the *Property Acquisition (Just Terms Compensation) Act 1991* and RMS’s *Land Acquisition Policy* (RTA 1999).

RMS has commenced consultation with directly affected property owners about the acquisition process and properties affected by the project are currently being purchased under voluntary agreements between RMS and property owners. This has helped to provide affected property owners with certainty about future decisions and financial security.

About 64 per cent of land acquisitions have commenced (as of September 2012).

Negotiations between RMS and owners of other directly affected properties are on-going as part of the property acquisition program.

#### **4.1.2. Impacts on directly affected properties**

The project would have long term impacts on directly affected properties due to changes in property access, property severance and sterilisation of land, demolition of buildings and structures and impact on future development potential.

The following provides a discussion of these impacts for properties affected by the project. Further information on potential impacts for individual properties is provided in Appendix A.

##### **Changes in property access**

The project would remove direct property access to the Pacific Highway for properties located adjacent to the Pacific Highway, within those sections upgrade to class M standard. These include:

- Section 1 – Woolgoolga to Range Road
- Section 3 – Glenugie upgrade to Tyndale
- Section 4 – Tyndale to Maclean
- Section 5 – Maclean to Watts Lane
- Section 8 – Trustums Hill to Broadwater National Park
- Section 9 – Broadwater National Park to Richmond River
- Section 10 – Richmond River to Coolgardie Road
- Section 11 – Coolgardie Road to Ballina bypass.

In those sections upgraded to class M standard, property access would be provided to the existing highway or to new service roads established for the project. In particular, in those areas where the project is realigned from the existing highway, property access would be maintained to the existing Pacific Highway. In those areas of the project which involve widening of the existing highway, property access would be provided to new service roads adjacent to the highway.

The need to maintain safe access for properties adjacent to the upgraded highway was identified as a concern for some property owners during consultation for the project. While removing direct access to the highway from adjacent properties may result in longer travel distances from some properties, this would improve safety and ease of access for local residents through reduced traffic volumes, including heavy vehicles. This is particularly relevant for those property owners required to access the upgraded highway with slow moving vehicles such as large trucks or farm machinery.

For those sections of the project initially upgraded to class A standard, property access would be maintained to the upgraded highway. These include:

- Section 1 – Range Road to Halfway Creek
- Section 2 – Halfway Creek to Glenugie upgrade
- Section 5 – Watts Lane to Iluka Road
- Section 6 – Iluka Road to Devil's Pulpit upgrade
- Section 7 – Devils Pulpit upgrade to Trustums Hill.

Further discussion on local access, including property access, is included in the transport working paper and socio-economic assessment working paper.

### **Property severance and sterilisation**

The location of the project would create a physical barrier and divide some existing larger properties into smaller parcels. In many instances, both portions of the property would have direct access to local roads. However, in some instances, the severed portion of the property would not be accessible either via local roads or the main portion of the affected property.

This was identified as a key concern during consultation for the project, particularly for agricultural property owners. Specifically, concerns were raised about restrictions on the movement of farm equipment and livestock between different areas of the property, including during flood events.

The design of the project has sought to minimise the severance and fragmentation of properties by closely following property boundaries. Where this has not been feasible, alternative access has been provided between separated portions of land, where possible, either via overpasses or underpasses.

Land use sterilisation occurs where properties/land uses are severed into fragments of a size and/or shape that make the on-going use or future development of the property unfeasible.

While the sterilisation of land has been avoided for most properties directly impacted by property severance, there are some individual properties where the size of the remaining portion of land makes the continued use or future development by the current owner unfeasible. However, this land may be useable by an adjoining property owner. This is further discussed in the remnant land strategy outlined in Section 5.5.

An assessment of potential impacts of property severance and sterilisation for individual properties directly impacted by the project is provided in Appendix A. Where property severance occurs, these properties have generally been identified as being "materially affected".

### **Demolition of structures**

The project would directly impact a number of buildings or structures located on properties to be acquired for the project. This includes approximately 60 residential dwellings as well as machinery and storage sheds. These structures would mainly require demolition, although some may be used for site compounds or shelter during construction.

An assessment of potential impacts on buildings and structures for individual properties directly impacted by the project is provided in Appendix A. Where a dwelling or major structure is required



to be demolished due to the project, the property has been identified as being “materially impacted”.

### **Impact on future property development**

The acquisition of land for the project would result in the reconfiguration of some partially impacted properties. Future development of the remaining property area is guided by the minimum lot sizes and development controls for each local government area.

Potential impacts on future property development may occur for some reconfigured properties due to a reduction in the property size and amount of developable area on each property. Any loss of development rights would be accounted for in the level of compensation paid by RMS in acquiring the property. This is further addressed in Chapter 5 of this report.

#### **4.1.3. Land ownership**

Properties directly impacted by the project include both private and public owned land. These include:

- 368 properties are privately owned
- 142 properties are currently owned by RMS, some having previously been acquired for the project
- 43 properties are owned by the NSW government, including Crown Land (reserves, State forests and national parks) and other government agencies
- 11 properties are owned by local governments including Clarence Valley Council and Richmond Valley Council.

### **NSW Government land**

The project’s operational footprint would directly affect about 43 parcels of NSW Government land comprising about 320 hectares. This includes crown reserves, roads and waterways, State forests, national parks and other Government agency land.

Table 4-1 details the NSW Government land to be acquired for the project, including the area of land impacted and description of impact.

The project’s impact on Crown Land would be relatively minor, with about 30 hectares of Crown Land directly impacted by the project over about 14 properties. This represents about 8.5 per cent of the total area of the 14 Crown Land properties affected (ie 358 hectares). While some Crown Land properties would be impacted by severance, overall the functionality of Crown Land properties has been maintained by the provision of new access points, where required.

**Table 4-1 NSW Government owned land**

Property ID	Lot/ DP	Crown Land	Existing land use	Total property area (ha)	Total impacted area (ha)	Description of impact
30104	Lot10 DP868045	Yes	Urban	1.9	0.7	Partial acquisition required. A new road access point incorporated into the design
21472	Lot11 DP751368	Yes	Conservation area	15.5	1.5	Partial acquisition required
21474	Lot26 DP751368	Yes	Conservation area	26.8	1.5	Partial acquisition required
21492	Lot3 DP707324	Yes	Grazing	0.4	0.4	Total acquisition required
30274	Lot7011 DP1051693	Yes	Urban	0.5	0.2	Materially affected due to percentage (46 per cent) of property required
21191	Lot7300 DP1144709	Yes	Tree and shrub cover	8.3	5.7	Materially affected due to percentage (69 per cent) of property
20708	Lot7001 DP92573	Yes	Tree and shrub cover	217.1	11.1	Materially affected due to severing. Underpass allowed for linking the two sides
20511	Lot130 DP751389	Yes	Tree and shrub cover	40.7	6.3	Materially affected. Road severs property and isolates eastern portion
21243	Lot1 DP1134934	No	Conservation area	1471.9	11.7	Partial acquisition required. A new road access road incorporated into the design
21186	CAD ID100356305	Unknown	Conservation area	62	12.1	Partial acquisition required. A new road access road incorporated into the design
21184	CAD ID100356440	Unknown	Conservation area	930.2	48.5	Partial acquisition required
30056	Lot14 DP755610	No	Conservation area	200	0.7	Partially affected including an internal access track
30057	Lot11 DP755610	No	Conservation area	128.9	0.3	Partially affected including an internal access track
21190	CAD ID104672361	Unknown	Conservation area	1391	53.3	Partial acquisition required
10148	Lot100 DP752853	No	Conservation area	111.5	4.9	Partial acquisition required

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Property ID	Lot/ DP	Crown Land	Existing land use	Total property area (ha)	Total impacted area (ha)	Description of impact
10149	Lot83 DP752820	No	Conservation area	133	1.1	Partial acquisition required
20615	Lot7002 DP92575	Yes	Tree and shrub cover	3.5	0.4	Partial acquisition required
20668	Lot SF661	Unknown	Conservation area	1832.1	16.3	Partial acquisition required
20851	Lot2 DP871186	No	Conservation area	312.4	1.7	Partial acquisition required
21357	Lot20 DP1123940	No	Conservation area	29.2	10.9	Partial acquisition required
30277	Lot/DP Unknown	Unknown	Conservation area	166.1	3.2	Partial acquisition required
30279	Lot/DP Unknown	Unknown	Conservation area	1358.3	0.1	Partial acquisition required
30284	Lot/DP Unknown	Unknown	Conservation area	229.6	12.7	Partial acquisition required
21108	Lot55 DP751358	No	Conservation area	177.4	4.5	Partial acquisition required
21128	Lot62 DP751358	No	Conservation area	104.1	3.0	Partial acquisition required
21133	Lot63 DP751368	No	Conservation area	19.9	1.0	Partial acquisition required
21183	Lot74 DP751380	No	Conservation area	250	23.1	Partial acquisition required
21241	Lot18 DP836263	No	Conservation area	372.4	1.8	Partial acquisition required
21374	Lot7005 DP1058539	Yes	Grazing	21.8	1.1	Partial acquisition required
21376	Lot111 DP751368	No	Conservation area	531.3	40.1	Partial acquisition required
21411	Lot7040 DP1115009	Yes	Tree and shrub cover	14	1.0	Partial acquisition required
30008	CAD Id 104709538	Unknown	Conservation area	1735.4	3.6	Partial acquisition required
30011	Lot19 DP755610	No	Conservation area	129.6	6.9	Partial acquisition required
30050	Lot3 DP247562	No	Conservation area	1.9	0.6	Partial acquisition required
30054	Lot25 DP755610	No	Conservation area	325.8	4.8	Partial acquisition required
30055	Lot20 DP755610	No	Conservation area	351.6	11.5	Partial acquisition required
30063	Lot7008 DP92609	Yes	Grazing	0.8	0.04	Partial acquisition required
30073	Lot420 DP755624	Yes	Tree and shrub cover	3.3	0.1	Partial acquisition required
30299	Lot1 DP1006289	No	River and Drainage System	15.1	2.0	Partial acquisition required

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Property ID	Lot/ DP	Crown Land	Existing land use	Total property area (ha)	Total impacted area (ha)	Description of impact
21373	Lot7004 DP1058539	Yes	Grazing	2.9	0.4	Partial acquisition required
21462	Lot1 DP1154585	No	Cropping	0.4	0.4	Total acquisition required
30019	Lot4 DP247562	No	Conservation area	8.7	8.7	Total acquisition required
30049	Lot2 DP247562	No	Conservation area	0.02	0.02	Total acquisition required

Note: The property ID refers to the property ID shown in the list of directly affected properties included in Appendix B

## Local Government land

Approximately 21 hectares of land owned by local governments would be directly affected by the project. Details of the properties to be acquired are detailed in Table 4-2. In particular, Lot 100 DP1131455 is important in the context of the project. Richmond Valley Council advised that this land will be used to accommodate a Broadwater Sewerage Scheme rising pump station in the future. A rising main will exit the pump station and travel along Broadwater-Evans Head road towards Evans Head. Consideration regarding the location and timing for construction of this main would be required during detailed design. Alternatively, an appropriate utility adjustment may be required.

**Table 4-2 Local Government owned land**

Lot/ DP	Local government area	Existing land use
Lot5 DP843369	Ballina	Grazing
Lot1 DP255019	Clarence Valley	Grazing
Lot7 DP255019	Clarence Valley	Grazing
Lot2 DP255019	Clarence Valley	Grazing
Lot1 DP400850	Clarence Valley	Urban
Lot42 DP602517	Clarence Valley	Transport and other corridors
Lot1 DP567753	Clarence Valley	Grazing
Lot4 DP806515	Coffs Harbour	Grazing
Lot6 DP806515	Coffs Harbour	Grazing
Lot100 DP1131455	Richmond Valley	Tree and shrub cover, however, proposed for use as a sewerage pumping station
Lot3 DP705502	Rous County Council	Urban

### 4.1.4. Construction impacts

Temporary impacts on land use and property would occur during project construction on land outside of the operational footprint, due to:

- The establishment of ancillary sites such as compounds, used to accommodate batch plants, stockpile areas, construction worksites and other temporary infrastructure required for construction, such as site offices. Around 233 hectares of land would be required outside the project boundary, of which around 200 hectares is estimated to be in agricultural land use (cropping, grazing or horticulture)
- Temporary construction sedimentation basins
- Modifications to the use of existing roads and access arrangements.

Impacts on land use and property from construction activities include:

- Temporary change to the existing land use and impact on the use and operation of land within the ancillary sites
- Soil erosion and other forms of land disturbance due to activities such as site establishment, vegetation removal, earth moving and road building
- Potential impacts on amenity for some adjoining land uses due to noise and dust generated by haulage vehicles and construction works, traffic disruptions, and potential visual impacts caused by land clearing, stockpiles, construction vehicles and equipment.

The location of temporary construction sites would be subject to refinement during the detailed design phase and in conjunction with contractors appointed to deliver the project and may be subject to change. Selection of locations for ancillary sites have been proposed based on site selection criteria including proximity to the project, accessibility, grade and environmental impacts.

Temporary sedimentation basins would also be constructed during construction to capture sediment from water runoff, including on land temporarily leased for the project outside of the operational footprint.

During construction, temporary changes to traffic conditions and access to local roads and the existing Pacific Highway would also be required near to construction works. These may impact on nearby land uses, including through increased travel times, changes to property access, and impacts on local amenity.

Following construction, land used for construction and not required for the project operation, would be rehabilitated and reinstated to its existing use.

## 4.2. Land identified for future development

Overall, the project would support future development across the region through improved access to major regional centres such as Coffs Harbour and Ballina and areas outside of the region such as south east Queensland.

There are no urban release areas identified for future residential or employment land directly impacted by the project. However, the project would support the development of these future growth areas, including near Maclean at Townsend, Gulmarrad and James Creek, through improved access and connectivity to major regional centres. In particular, *the Maclean Urban Catchment Local Growth Management Strategy 2011* adopted by the Clarence Valley Council in August 2011, indicated that the project would reduce the need for additional local road network upgrades to provide increased access to these growth areas. Investigations undertaken for the Maclean Urban Catchment Local Growth Management Strategy also found that development identified by the strategy would not adversely affect the Pacific Highway network.

Land zoned for *Rural (Investigation)* is located near the project in Section 5, Section 8 and Section 9. These areas do not contain significant levels of existing development. This land may be suitable for future urban development at proposed interchanges.

## 4.3. Agricultural land

Potential impacts on agricultural land from the project may result from:

- Acquisition of agricultural land within the project, resulting in the permanent loss of agricultural land and a change in land use to road transport infrastructure
- Temporary use of agricultural land for construction, such as ancillary sites
- Changes in access to and within farm properties, due to the location of the project
- Fragmentation and severance of agricultural properties, due to the location of the project
- Impact on farm infrastructure such as dams, sheds and fencing due to the location of the project or construction activities.

### 4.3.1. Directly affected agricultural land

#### Operation

The project would require the whole or partial acquisition of agricultural land within the project, including land used for grazing, cropping and horticulture. This would directly impact about 290 agricultural properties across around 953 hectares.

While the loss of agricultural land and agricultural properties is significant for individual farmers directly impacted and local farming communities, regionally, the amount of agricultural land acquired for the project, is considered relatively minor, comprising approximately 0.2 per cent of total agricultural land in the region. Based on individual local government areas:

- Ballina is expected to have the greatest impact as a proportion of total agricultural land, with 140 hectares of land area lost, or 0.5 per cent of agricultural land in the Ballina local government area
- The Clarence Valley, Coffs Harbour and Richmond Valley local government areas are expected to have greater areas of agricultural land impacted by the project, although this represents a lower proportion of total agricultural land in each local government area (between 0.1 per cent and 0.2 per cent).

The direct loss in agricultural land use by crop type due to the project is expected to be minor across the study area.

As shown in Table 4-3, the project is expected to result in:

- A loss of around 1.8 per cent in the use of irrigated vegetables and herb production. This represents about one hectare of irrigated vegetable and herbs land of about 52 hectares in the study area. Impacts on this crop are expected to occur within the Clarence Valley local government area
- A loss of around 0.7 per cent of in the use of aquaculture, representing about 2 hectares of land area used for this crop in the study area. Impacts on this crop are expected to occur within the Clarence Valley local government area

- A loss of around 0.9 per cent in sugarcane use, representing about 319 hectares of sugarcane land of about 35,652 hectares of total agricultural land for this crop in the study area. Impacts on this crop are expected to occur within the Clarence Valley, Richmond Valley and Ballina local government areas
- A loss of around 1.9 per cent in the use of vine fruits. This represents about 0.5 hectare hectare of land of 26 hectares of land for this crop. Impacts on this crop are expected to occur within the Coffs Harbour local government area.

**Table 4-3 Estimated loss in agricultural land use as a percentage of total agricultural land**

Crop	Total area (hectares)	Affected area (hectares)	Area lost (%)
Aquaculture	350	2	0.6
Hardwood production	4,882	0	0.0
Irrigated tree fruits	1,157	4	0.3
Irrigated vegetables and herbs	53	1	1.9
Irrigated vine fruits	38	0	0.0
Pasture mosaic	508,497	608	0.1
Softwood production	6,041	4	0.1
Sugar	35,652	319	0.9
Tree fruits	4,727	5	0.1
Tree nuts	8,847	1	0.01
Vegetables and herbs	261	1	0.4
Vine fruits	26	0.5	1.9
Other	21,241	7	0.3
Total	591,772	953	0.2

Note: Figures may not sum precisely due to rounding.

Further discussion about impacts on agricultural land uses is provided in the socio-economic working paper.

## Construction

During construction, some agricultural land outside of the operational footprint would also be leased for ancillary sites. This would result in the temporary disruption to agricultural activities on that land for the duration of construction. Following construction, the land would be restored for agricultural use.

### 4.3.2. Regionally significant farmland

Impacts on regionally significant farmland have been minimised, including where possible, by avoiding areas of regionally significant farmland and limiting construction works to the project's operational footprint. However, the project would directly impact approximately 386 hectares of regionally significant farmland. This represents about 0.14 per cent of land identified as regionally significant farmland in the Northern Rivers and Mid-North Coast areas.



Further discussion on project impacts on regionally significant farmland within each project section is provided in Table 4-4.

#### 4.3.3. Fragmentation and severance of agricultural properties

During consultation for the project, concerns were raised by property owners and primary producers about the location of the project and potential for this to:

- Result in the fragmentation or severance of larger rural properties, potentially isolating or sterilising some parts of a rural property
- Restrict the movement of farm equipment and livestock between different areas of the property, particularly during flood events.

While these changes may not impact on the underlying agricultural land use of the affected properties, this may impact on the operation, productivity or viability of some agricultural properties and businesses.

Acquisition of agricultural land for the project may also result in some remnant land parcels. These may be of a size and/or configuration in which it is impractical to maintain the existing agricultural activity, possibly resulting in changes from relatively intensive agricultural land uses (eg macadamias) to lower intensity uses such as grazing.

Potential economic implications of property fragmentation and severance are discussed in the working paper – Socio-economic, while the potential impacts of the project on flooding are discussed in the working paper – Hydrology and flooding.

Where possible, the project has been located to minimise potential impacts on agricultural land uses. In particular, locating the project adjacent to the existing highway, where possible, and locating ancillary sites within the operational footprint of the project to avoid the need for additional land, has helped to minimise potential impacts on agricultural land uses.

The project has been designed to maintain internal property access to isolated land parcels through the provision of underpasses of the highway for moving livestock, where possible. Individual property access requirements will be negotiated with individual land users. Where the provision of underpasses is not considered economically viable and suitable alternate access is not available, affected land would be acquired in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991* and RMS's *Land Acquisition Policy* (RTA, 1999). This land would be made available for purchase by other agricultural producers.

The project would directly impact three properties currently used as refuges for stock during flood events, including at Mitchell Hill and Tyndale. The project would not change the potential for flood evacuation of the Clarence River floodplain to either of these flood refuges. The property at Mitchell Hill is cut by the project with the majority of land on the far side of the project. Access to the property would be maintained via the Mitchell Road underpass, including for the movement of stock by either truck or overland. The properties at Tyndale would also be cut by the project. Access to the properties would be maintained via a new road and underpass connecting Coldstream Road to the west.

Further discussion on property acquisition and remnant land is provided in chapter 5 of this report. This includes an assessment of the most likely and appropriate use of remnant land following construction of the project.

#### 4.3.4. Other impacts on agricultural uses

##### Operation

A number of other impacts for agricultural land uses from the project operation were identified during consultation for the project, including the location of new cane pads and potential for the road to increase flooding of agricultural properties.

Agricultural land containing cane pads is impacted by the project and would be acquired for the project. The location of the project would also result in the severance or isolation of some sugar cane land from cane pads. This would require the relocation of existing cane pads at:

- Byrons Lane, Tyndale
- Norleys Lane
- Causleys Lane, Gulmarrad
- North of Causleys Lane.

Consultation for the project identified that the location of cane pads is critical to the operation of sugar cane properties. The relocation of cane pads would be undertaken in consultation with cane growers and affected property owners.

Concerns were raised during consultation for the project about the potential for the project to impact on agricultural land due to increased flood impacts, such as longer inundation times, increased flood levels, and erosion. Potential impacts on flooding and flood behaviour due to the project are discussed in the Working paper - Hydrology and flooding.

##### Construction

Potential construction impacts on the Berry Exchange located at Range Road, Corindi, within Section 1 of the project, were identified during consultation for the project. Issues were raised also about potential impacts of the Berry Exchange operations on nearby construction activities. These included:

- Use of pesticides by the Berry Exchange and potential impacts on nearby construction workers
- Potential impacts of pesticides used in the construction of the project and potential for this to impact on the Berry Exchange
- Impact on blueberry plants due to increased dust from construction activities
- Changes to local access and potential impacts on access to the Berry Exchange, including the transport of workers during the peak berry picking season
- Potential impacts on water quality and security of water supply during construction.

Implementation of environmental management measures would assist in minimising potential impacts on blueberry plants and the Berry Exchange operations. This includes the establishment of

temporary sedimentation basins during construction to capture storm water run-off from earthworks and preventing this from entering waterways and impacting on water quality.

Where pesticides are proposed to be used during construction, this would be undertaken in accordance with the appropriate environmental procedures to minimise potential impacts on adjoining properties. On-going consultation and communication would also be undertaken with the Berry Exchange to ensure appropriate health and safety procedures are in place for construction workers when pesticides are used by the exchange.

Access from the Pacific Highway to the Berry Exchange would be provided via the interchange at Range Road, which is immediately adjacent to Berry Exchange.

During construction, potential impacts on agricultural uses may also occur through the spread of weeds, soil diseases and pests between properties. This was identified by the Berry Exchange as a particular concern for blueberry plants. The implementation of appropriate environmental management measures (eg vehicle wash down procedures) would be important in minimising potential impacts on farming properties. Appropriate mitigation measures are discussed in the following chapter of this report.

#### 4.3.5. Agricultural diseases, quarantined properties and travelling stock reserves

There are no properties impacted by the project that are currently quarantined by the Livestock Health and Pest Authority or listed by the Authority as having agricultural diseases. There are no travelling stock reserves directly impacted by the project.

#### 4.3.6. Summary of impacts on agricultural uses

Table 4-4 provides a summary of key impacts on agricultural land associated with the construction and operation of the project.

**Table 4-4 Summary of impacts on agricultural land**

Project section	Location	Summary of impacts
1	Woolgoolga to Halfway Creek	<p>The project would require the total or partial acquisition of agricultural land used for horticulture and grazing in this section. This includes grazing land identified as regionally significant farmland.</p> <p>Fragmentation of some larger agricultural properties also occurs, where the project is realigned from the existing Pacific Highway. These generally involve grazing land.</p> <p>Horticultural land comprising the Berry Exchange is located at Range Road, Corindi. Potential impacts of the project on the Berry Exchange are discussed in Section 4.3.4.</p> <p>Access would be maintained to the existing highway for adjacent agricultural uses. For agricultural uses adjacent to the realigned highway, access would be provided via local roads or service roads, connecting to the interchange at Range Road.</p> <p>Temporary impacts on agricultural land in this section would also occur from the location of ancillary sites and temporary detention basins. This includes impact on land identified as regionally significant farmland.</p> <p>The location of temporary detention basins are mainly within the</p>

Project section	Location	Summary of impacts
		operational footprint for the project. However, ancillary sites impact on agricultural land beyond the operational footprint, particularly in the southern part of this section and west of Corindi.
2	Halfway Creek to Glenugie upgrade	<p>This section generally involves widening the existing highway, with a deviation to the east from the existing alignment within the Newfoundland State Forest to Franklin Road.</p> <p>Small areas of horticultural land and grazing land are directly impacted near Wells Crossing from the widening of the highway, although this is not expected to impact on the overall use of these properties.</p> <p>Areas of agricultural land at Wells Crossing, located outside of the operational footprint would also be temporarily impacted by ancillary sites used for construction. These include a small area of grazing land located west of the existing highway and north of Parker Road, as well as a small area of horticultural land located west of the highway, north of Halfway Creek.</p> <p>Sites identified for temporary detention basins that impact on agricultural land, are mainly located within the operational footprint for the project.</p> <p>Access to agricultural properties adjacent to the existing highway would continue to be provided via local roads or new service roads constructed as part of the project.</p>
3	Glenugie interchange to Tyndale	<p>This section involves a new highway alignment east of the existing highway between Glenugie and Tyndale. This is a 35 kilometre stretch of off-line highway, bypassing Grafton and Ulmarra. It would introduce a major road corridor within the Clarence Valley local government area across land not previously developed for this type of infrastructure.</p> <p>The project would require the total or partial acquisition of agricultural land, mainly used for grazing, between the interchange at Eight Mile Lane and Bostock Road. This will contribute to the loss of grazing land in the region.</p> <p>In this section, the project would also impact on a property identified for horticultural uses north of Wants Lane as well as a small area of cropping land located near the proposed Tyndale interchange.</p> <p>The project would not require the acquisition of land identified as regionally significant farmland in this section.</p> <p>While the project has sought to minimise potential impacts of property severance, fragmentation of some larger grazing properties occurs due to the location of the project.</p> <p>Access to agricultural uses within this section of the project would continue to be provided via local roads.</p> <p>Temporary impacts on agricultural land in this section would also occur from the location of ancillary sites and detention basins used for construction. This will impact agricultural land beyond the operational footprint, including at Six Mile Lane, west of the project north of Mitchell Road, east of the project near Firth Heinz Road; at Coldstream Road, Coldstream; and near the proposed interchange at Tyndale.</p>
4	Tyndale to Maclean	<p>This section involves realigning the highway east of the existing Pacific Highway alignment.</p> <p>The project would require the total or partial acquisition of agricultural land, including land identified as regionally significant farmland.</p> <p>Much of the agricultural land impacted comprises cropping land used for sugar cane, located between the proposed interchanges at Tyndale</p>

Project section	Location	Summary of impacts
		<p>and Maclean, although areas identified for grazing land are also impacted, mainly near Byron's Lane, near McIntyres Lane, and north of the proposed interchange at Maclean. A small area of land identified for horticultural uses is also impacted south of McIntyres Lane.</p> <p>Fragmentation of some larger agricultural properties also occurs in this section. This mainly affects cropping land located south of Shark Creek Road and north of McIntyre's Lane.</p> <p>Access would be maintained to the existing highway for agricultural properties adjacent to the existing highway. For agricultural uses adjacent to the realigned highway, access would continue to be provided via local roads.</p> <p>Temporary impacts on agricultural land in this section would also occur from the location of ancillary sites and temporary detention basins. This includes impact on land identified as regionally significant farmland. The location of temporary detention basins are mainly within the operational footprint for the project. However, ancillary sites impact on agricultural land beyond the operational footprint, including grazing land north of the proposed interchange at Tyndale and between Shark Creek Road and McIntyres Lane; and cropping land south of Shark Creek, north of McIntyres Lane, and adjacent to the Pacific Highway south of the proposed interchange at Maclean.</p>
5	Maclean to Iluka Road, Mororo	<p>This section involves widening the highway, generally following the existing highway alignment, including through the village of Harwood, as well as a new bridge over the Clarence River at Harwood.</p> <p>The project would require the acquisition of agricultural land, including land identified as regionally significant farmland, located adjacent to the existing Pacific Highway.</p> <p>Much of the agricultural land impacted comprises cropping land used for sugar cane, located north of the Clarence River at Harwood at North Arm. A small area of cropping land is also affected by the widening of the existing Pacific Highway south of the Yamba Road interchange. Areas of grazing land are also impacted, including a small area east of the existing Pacific Highway near Maclean, south of the Clarence River and north of North Arm.</p> <p>Potential impacts on fragmentation of agricultural properties is generally minimised in this section due to the location of the project next to the existing Pacific Highway. However, direct access to the highway from adjacent properties would be restricted, with access provided via local roads and new service roads constructed for the project. This may make access for some farms that comprise multiple properties located either side of the highway, less direct.</p> <p>Access to the sugar mill at Harwood for cane growers located south of the Clarence River, would be via the existing bridge across the Clarence River.</p> <p>Temporary impacts on agricultural land in this section would also occur from the location of ancillary sites and temporary detention basins. This includes impact on land identified as regionally significant farmland. The location of temporary detention basins are generally within the operational footprint for the project, although some basins partly extend the operational footprint of the project and impact on small areas of additional cropping land. Ancillary sites also impact on agricultural land beyond the operational footprint, including grazing land south of the Clarence River and cropping land at Harwood and near the interchange at Watts Lane.</p>

Project section	Location	Summary of impacts
6	Iluka Road to Devils Pulpit upgrade	<p>This section generally involves widening of the existing highway.</p> <p>The project would require the acquisition of agricultural land located adjacent to the existing Pacific Highway. This includes agricultural land used for cropping north of the proposed Iluka Road interchange at Mororo, and grazing land near the intersection of the Pacific Highway with Tully Morgan-Jacky Bulbin Road.</p> <p>Potential impacts on fragmentation of agricultural properties in this section are generally minimised due to the location of the project next to the existing Pacific Highway.</p> <p>Access to agricultural properties adjacent to the existing highway would be provided via local roads or new service roads constructed as part of the project.</p> <p>Temporary impacts on agricultural land in this section would also occur from the location of ancillary sites and temporary detention basins. The location of temporary detention basins are generally within the operational footprint for the project, although some basins partly extend the operational footprint of the project and impact on small areas of additional grazing or cropping land. Ancillary sites impact on agricultural land beyond the operational footprint, including grazing land located east of the highway near the intersection with Tully Morgan-Jacky Bulbin Road.</p>
7	Devils Pulpit upgrade to Trustums Hill	<p>This section generally involves widening the highway, generally to the west of the existing highway.</p> <p>Agricultural uses in this section of the project are generally limited. The project would require the acquisition of small areas of agricultural land used for grazing located adjacent to the existing Pacific Highway. This mainly includes land located east of the highway south of Turners Road, and west of the existing highway south of Trustums Hill.</p> <p>Potential impacts on fragmentation of agricultural properties in this section are generally minimised due to the location of the project next to the existing Pacific Highway.</p> <p>Access to agricultural properties adjacent to the existing highway would be provided via local roads or new service roads constructed as part of the project.</p> <p>Temporary impacts on agricultural land in this section would also occur from the location of ancillary sites and temporary detention basins. The location of temporary detention basins and ancillary sites impact on agricultural land beyond the operational footprint, including grazing land located adjacent to the highway south of Turners Road and west of the highway south of Trustums Hill.</p>
8	Trustums Hill to Broadwater National Park	<p>This section involves realigning the highway east of Woodburn.</p> <p>The project would require the acquisition of agricultural land, including areas of land used for grazing mainly south and east of Woodburn, and areas of land used for cropping between Tuckombil Canal and McDonalds Creek. Areas of grazing land are also directly impacted north-east of Woodburn as well as a small parcel of land used for horticulture north of Macdonald's Creek.</p> <p>Fragmentation of some larger agricultural properties also occurs in this section. This mainly occurs where the project is realigned east of Woodburn.</p> <p>Access would be maintained to the existing highway for agricultural properties adjacent to the existing highway. For agricultural uses adjacent to the realigned highway, access would continue to be</p>

Project section	Location	Summary of impacts
		<p>provided via local roads.</p> <p>Temporary impacts on agricultural land in this section would also occur from the location of ancillary sites and temporary detention basins. This includes impact on land identified as regionally significant farmland. The location of temporary detention basins are generally within the operational footprint for the project, although some basins partly extend the operational footprint of the project and impact on small areas of additional grazing or cropping land.</p> <p>Ancillary sites impact on agricultural land beyond the operational footprint, including grazing land south of Tuckombil Canal, as well as a mix of grazing and cropping land south of Woodburn Evans Head Road and west of Drain Trail.</p>
9	Broadwater National Park to Richmond River	<p>This section involves widening the existing highway through the Broadwater National Park and then realigning the highway east of Broadwater. A new interchange is also proposed to connect to the Broadwater-Evans Head Road.</p> <p>The project would require the acquisition of agricultural land, including areas of land mainly used for grazing located east of Broadwater, and a small area of cropping land located north of Broadwater. A small parcel of horticultural land is also located west of the existing Pacific Highway at the southern end of this project section, which would also be directly impacted by the widening of the existing highway.</p> <p>Fragmentation of some larger grazing properties also occurs in this section. This mainly occurs where the project is realigned east of Broadwater.</p> <p>Access would be maintained to the existing highway for agricultural properties adjacent to the existing highway at Broadwater. For agricultural uses adjacent to the realigned highway, access would continue to be provided via local roads.</p> <p>Temporary impacts on agricultural land in this section would also occur from the location of ancillary sites and temporary detention basins. The location of temporary detention basins are mainly within the operational footprint for the project. However, ancillary sites impact on agricultural land beyond the operational footprint, including grazing land east of the existing Pacific Highway north of Woodburn, and west of the proposed interchange at Broadwater.</p>
10	Richmond River to Coolgardie Road	<p>This section extends from the southern side of the Richmond River and involves realigning the highway west of the Richmond River and the town of Wardell. A new interchange is also proposed at Coolgardie Road, north of the Wardell township. A new bridge would be required across the Richmond River.</p> <p>The project would require the acquisition of agricultural land, including areas of land mainly used for grazing located north of the Tuckean Broadwater and Old Bagotville Road, as well as cropping land mainly located on the southern side of Tuckean Broadwater, and near Old Bagotville Road.</p> <p>Fragmentation of some larger agricultural properties also occurs in this section. This mainly occurs where the project is realigned west of Wardell.</p> <p>Access would be maintained to the existing highway for agricultural properties adjacent to the existing highway. For agricultural uses adjacent to the realigned highway, access would continue to be provided via local roads.</p>

Project section	Location	Summary of impacts
		<p>Temporary impacts on agricultural land in this section would also occur from the location of ancillary sites and temporary detention basins. The location of temporary detention basins are generally within the operational footprint for the project, although some basins partly extend the operational footprint of the project and impact on small areas of additional grazing or cropping land.</p> <p>Ancillary sites impact on agricultural land beyond the operational footprint, including cropping land south of the Tuckean Broadwater, a mix of cropping and grazing land north of the Tuckean Broadwater, and grazing land south of the proposed Wardell interchange.</p>
11	Coolgardie Road to Ballina Bypass	<p>This section generally involves widening the existing highway.</p> <p>The project would require the acquisition of agricultural land located adjacent to the existing Pacific Highway. Much of the agricultural land impacted comprises cropping land used for sugar cane, located either side of the existing Pacific Highway from just south of McAndrews Lane and Whytes Lane. A small area of grazing land is also located west of the existing Pacific Highway, north of the proposed Wardell interchange.</p> <p>Potential impacts on fragmentation of agricultural properties is generally minimised in this section due to the location of the project next to the existing Pacific Highway. However, direct access to the highway from adjacent properties would be restricted, with access provided via local roads and new service roads constructed for the project. This may make access for some farms that comprise multiple properties located either side of the highway, less direct.</p> <p>Temporary impacts on agricultural land in this section would also occur from the location of ancillary sites and temporary detention basins. The location of temporary detention basins that impact on agricultural land are mainly within the operational footprint for the project. However, ancillary sites impact on agricultural land beyond the operational footprint, including grazing land north of the proposed Wardell interchange and cropping land south of McAndrews Lane.</p>

## 4.4. Conservation areas, national parks and reserves

Potential project impacts on land used for national parks, reserves or conservation areas include direct impacts associated with the loss of national park or reserve land due to the location of the project and indirect impacts such as changes in access.

The project passes through or adjacent to:

- Broadwater National Park, located between Woodburn and Broadwater
- Tabbimoble Swamp Nature Reserve and Bundjalung National Park and State Conservation Area, located south of Woodburn
- Yaegl Nature Reserve located near Maclean
- Wells Crossing Flora Reserve, located north of Halfway Creek
- Yuraygir State Conservation Area, located south of Halfway Creek.



In addition, the project passes through a number of areas comprising tree and shrub cover that have environmental or conservation values.

The project has been located to minimise direct impact on conservation land uses, where possible. However, some areas of land identified as national park, conservation area or reserve is affected by the operational footprint for the project. Land currently reserved under the *National Parks and Wildlife Act* that would form part of the future road reserve is currently being revoked as land reserved under this act.

Potential impacts on the ecological and conservation values of national parks, reserves or conservation areas due to the construction or operation of the project are discussed in the Working paper – Biodiversity.

### **Broadwater National Park**

The Broadwater National Park is located within Section 8 and Section 9 of the project. The existing Pacific Highway currently passes through the national park. The upgrade would involve widening of the western side of the highway.

Widening of the highway would require the acquisition of about 17 hectares of land within the national park. Acquisition would occur in accordance with the *National Parks and Wildlife Act* and in consultation with the Office of Environment and Heritage. Construction of the project would occur within the operational footprint and no additional land would be required for construction.

The acquisition of land for the project would not affect the use, operation or integrity of the national park, given the required land is located adjacent to the existing road reserve which passes through the park and would not involve exposing new areas of the national park to the road corridor.

During consultation for the project, concerns were raised by State government agencies about the need for the project to consider fire management access, implementation of containment fire trails, Native Title and maintaining drainage.

Access to fire tracks within the national park would be maintained during construction and operation of the project. Public access to Broadwater National Park would be maintained via the current access at the Woodburn-Evans Head Road and Broadwater-Evans Head Road. Interchanges would be provided to both of these roads from the Pacific Highway.

Native Title implications of the project are discussed in the Working paper – Aboriginal cultural heritage assessment.

### **Tabbimoble Swamp Nature Reserve**

The project is located adjacent to the western boundary of the Tabbimoble Swamp Nature Reserve and the eastern boundary of the Bundjalung State Conservation Area. Works within this area would involve widening of the existing Pacific Highway.

Widening of the road corridor in that section adjacent to the Tabbimoble Swamp Nature Reserve would occur west of the existing Pacific Highway. This would avoid direct impacts of the project on the nature reserve.

### **Yaegl Nature Reserve**

The Yaegl Nature Reserve is located within Section 5 of the project, east of Maclean. The existing Pacific Highway is mainly located adjacent to the western and northern boundaries of the nature reserve, although the Pacific Highway traverses a small section of the nature reserve north of the

proposed interchange at Maclean. The upgrade would involve widening of the existing highway to the east and west

Widening of the highway would require the acquisition (following revocation) of about 1.7 hectares of land within the nature reserve. Acquisition would occur in accordance with the *National Parks and Wildlife Act 1974* and in consultation with the Office of Environment and Heritage. Construction of the project would occur within the project's operational footprint and no additional land would be required for construction.

The acquisition of land for the project would not affect the use, operation or integrity of the nature reserve, given that the required land is located adjacent to the existing road reserve located adjacent to the reserve and would not involve exposing new areas of the nature reserve to the road corridor.

Consultation for the project identified the following land use issues in relation to the Yaegl Nature Reserve:

- Loss of the Strategic Fire Advantage Zone (SFAZ), resulting in potential fire reduction capacity on the western boundary to restrict fires from the road easement
- The need for all weather access to be provided from Farlows Lane, which is the main access point and only all-weather access for management works on the western side of the nature reserve.

The current access arrangements from the Pacific Highway to Farlows Lane would be maintained via the interchange at Yamba Road. Existing access to the eastern portion of the Yaegl Nature Reserve and to Koala Drive would be maintained via the underpass of the Pacific Highway.

#### **Wells Crossing Flora Reserve**

The Wells Crossing Flora Reserve north of Halfway Creek is located east of the existing Pacific Highway. Widening of the road corridor, including a minor realignment, would directly impact on the flora reserve. While this would result in the loss of around 40 hectares of the reserve and native vegetation, this is not expected to impact on the overall use of the flora reserve.

Widening of the road corridor would accommodate a wider central median, which will allow for the retention of existing vegetation following completion of the highway upgrade. The vegetation would include tall trees that would allow arboreal mammals (ie threatened glider species) further opportunity to cross the project.

#### **Yuraygir State Conservation Area**

The project is located adjacent to a small section of Yuraygir State Conservation Area at Halfway Creek. Road widening within this section of the project forms part of the Halfway Creek upgrade project.

##### **4.4.1. Areas of tree and shrub cover**

#### **Operation**

Where possible, the project has been located to minimise impacts on areas of tree and shrub cover. However, the project would impact on these areas along the length of the road corridor. This

includes land identified as tree and shrub cover located adjacent to the existing Pacific Highway that would be impacted by road widening or minor amendments to the road alignment.

However, there are some larger areas of tree and shrub cover impacted by the project where it is realigned from the existing Pacific Highway. In particular, this includes:

- Section 1 – between Redbank Creek and the interchange at Range Road
- Section 3 – north of the proposed Eight Mile Road interchange; between the Coldstream River and Woolli Road; near Mitchell Road; and between Bostock Road and the proposed Tyndale interchange.

The acquisition of land for the project would result in a change in land use from tree and shrub cover to road corridor.

The project would also result in the fragmentation of some larger areas of tree and shrub cover, particular in Section 1 and Section 3. Potential impacts on the flora and fauna values of these areas, including matters of national environmental significance, due to the clearing of vegetation are discussed in the flora and fauna working paper.

## **Construction**

Ancillary sites and temporary detention basins have been located within the operational footprint area, where possible. This has helped to minimise additional impacts on areas of tree and shrub cover and amount of vegetation clearing required. However, there are some locations where the temporary detention basins extend beyond the operational footprint boundary, impacting on small areas of additional tree and shrub cover. These areas would be rehabilitated following construction.

## **4.5. Natural resources**

This section provides an overview of potential impacts of the project's construction and operation on natural resources, including mining and petroleum production, extractive resources and State forests.

### **4.5.1. Mining and petroleum production**

The project traverses land subject to existing mining and petroleum exploration licences, including petroleum exploration licences relating to coal seam gas within the Clarence-Moreton Basin. Currently, there is no activity associated with petroleum production near the project and no major applications for petroleum production have been received by the Department of Primary Industries for land near the project. However, exploration for coal seam gas is occurring in the region to determine the commercial potential for development of coal seam gas production.

On-going consultation with the coal seam gas proponents operating in the study area and relevant NSW State government agency would be undertaken during the detailed design and construction phases of the project to ensure that impacts on the project and on the future coal seam gas production are minimised.

#### 4.5.2. Quarries, resource depletion and sterilisation

Potential impacts on quarry operations from the construction and operation of the project include:

- Direct impacts, associated with the acquisition of land used for quarrying located within the project
- Indirect impacts, associated with potential restrictions of quarry operations due to the proximity of the project to the quarry or changes to access.

Information on quarry materials required for the project, including potential sources and access routes, is provided in Chapter 6 (Description of the project – construction). In summary, the project would require an estimated 1.23 million tonnes of road base, about 0.79 million tonnes of sand and about 1.4 million tonnes of aggregate for the construction of drainage structures and pavements, spray sealing works and for the production of concrete and asphalt. A further 0.5 to 0.6 million tonnes of earthworks material is also assumed to be required. In total, an estimated 4 million tonnes of construction materials and earthworks would need to be imported from across the project including local quarries to the various construction sites and batching plants.

Sand would be sourced from a number of local quarries across the project area. Aggregates would be sourced from hard rock quarries in the region (to the south in Coffs Harbour and Woolgoolga; and to the north in Casino, Lismore, Ballina and Coraki).

On-site concrete batching plants would be established for the construction of rigid (concrete) pavements at all project sections, with the exception of Section 11, where rigid pavements would not be used. Instead, Section 11 would source its concrete requirements from existing local commercial sources, with facilities located in Ballina, Lismore or Alstonville.

Other materials used in pavement construction, such as road base (about 560,000m<sup>3</sup> (1.23 million tonnes)), pavement and sealing aggregates would not be available from project cuttings (based on available geotechnical information) and would need to be imported from local quarries.

Cement and fly ash for concrete production and pavement stabilisation would be imported by road or rail from Newcastle, Sydney or Brisbane. It is expected that storage silos would be established on site, adjacent to the concrete batching plants.

A key design principle for the project is to obtain as much material as possible from the project boundary to minimise the environmental impacts associated with importing materials. Achieving a balanced cut and fill design has been a primary consideration as part of the previous development projects and on-going design refinements. There would however be a requirement to import general fill and higher quality materials (ie for select, granular and concrete pavement layers) from either existing or commercial quarries or from borrow sites specifically established for the project adjacent to or away from the project boundary.

In parts of the far north coast region, it is estimated that there is currently a need for 470,000-620,000 tonnes per annum of sand, general fill and road base and 620,000-780,000 tonnes per annum for aggregates (AVKO Mining, 2009). Long-term on-going construction activities could increase the demand for these materials and has the potential to deplete quarry materials in the region. This would occur especially where material is sourced from the same quarry for a number of different project sections or where adjoining sections are constructed at the same time. This may lead to resource depletion of that particular material source or quarry site.

Along the north coast of NSW, there is an existing shortage of hard rock and in the far north coast there is a shortage of construction sand. These materials may need to be sourced from areas further afield for use on the project. To minimise the depletion of this resource, alternatives should be considered during detailed design of future stages. Alternatives could include the use of recycled material (such as crushed recycled concrete for aggregate), to reduce the need for hard rock.

Sterilisation of a quarry occurs when material from a quarry cannot be removed from the site due to removal of access or other obstruction that makes the quarry unable to operate. There are three quarries near Broadwater in Section 9 that are within or in close proximity to the project boundary and an additional three quarries near Bagotville in Section 10. Where a quarry is located within the project boundary, the whole property would be acquired wherever possible and as much of the material extracted from the quarry and used in the project. All commercial quarries, not directly impacted within the project boundary would have access maintained to avoid sterilisation of resources and to enable their on-going operation.

## Operation

Around 119 operational quarries operate across the North Coast region supplying construction materials. Potential quarry sources of construction materials are listed in Table 4-5. The project would require the partial or total acquisition of seven parcels of land at six separate quarries. This equates to around 5 per cent of available quarries across the North Coast. In addition to this, cuttings across the project have been identified as sources of fill material, to minimise the requirement for imported construction materials, in particular at Lang Hill (Section 8) and west of Wardell Road (Section 10).

Potential economic impacts on quarry operations are discussed in the Working paper - Socio-economic.

The project would result in the loss of around 26.3 hectares of quarry land and production output from a change in land use from quarry uses to transport corridor. However, where property acquisition affects part of the property only and the project does not impact on that area of land used for quarry operations, the quarry would continue to operate. Figure 4-1 to Figure 4-3, indicates the impact of the project on quarry land in Tucabia, Broadwater and Bagotville. For the majority of these impacts, the extractive areas remain largely unaffected in places. Exceptions to this include quarry activities to the east of Pine Tree at STN 144.5 and the south-west of Montis Road at STN 149.0, both in Section 9 of the project near Bagotville. These sites appear to be used for sand extraction, and could provide a materials source during construction.

Consultation between RMS and quarry operators would inform future access arrangements, and implications for operating conditions including blasting for those quarries able to continue operating. Similarly, further consultation would inform an estimate of the quantity of extractive material that would be lost or sterilised by the project. In this regard, quarry outputs are restricted by the licence for the facility. These restrictions may specify the annual extraction limit, the number of truck movements per day, controls on access or operating hours. Conditions for supply of construction materials within current licence conditions would need to be confirmed with quarry operators prior to the construction of the project. The current available extraction limits for potential quarry sources that could be used for the project are listed in Table 4-5.

While the loss of properties used for quarry purposes may be significant for directly impacted quarry operators, given the number of operational quarries across the NSW North Coast region, the impact on the overall industry from this resource being utilised or lost is expected to be manageable with alternative supplies available at other quarry sites. At the same time, the

sensitivity of the extractive industry to transport costs is likely to mean the wider industry could benefit from the project's development through increased freight capacity and efficiency.

**Table 4-5 Potential quarry sources**

Location	Quarry name	Location	Quarried material	Extraction limit
South of project	Boambee	Coffs Harbour	Greywacke	Unknown
South of project	Woolgoolga	Sandy Beach	Argillite	100,000 tonnes per annum
Section 2	Sullivan	Pillar Valley	Sandstone	20,000 m <sup>3</sup> per year
Section 3	Jackys Creek	Ramornie	Ironstone and ridge gravel	60,000 tonnes per annum
Section 3	Seelands River Gravel Pit	Jackadgery	Ironstone and ridge gravel	Unknown
Section 3	Tyndale	Tyndale	Sandstone	Unknown
Section 6	Tullymorgan	Tabbimoble	Sand and sandstone	150,000 m <sup>3</sup> per year
Section 9	Campbells	Broadwater	Chert and coastal sand	70,000 tonnes per annum
Section 10	Eatons	Bagotville	Sand	Unknown
Section 10	Montis	Bagotville	Sand	Unknown
Section 10	Peterson	Coraki	Basalt	80,000 tonnes per annum
Section 11	Val's Hardrock	Wyarallah	Unknown	Unknown
Section 11	Clovass	Casino	Basalt	100,000 tonnes per annum
North of project	Foxes	Teven	Argillite and Dolerite	220,000 tonnes per annum
North of project	Teven	Teven	Basalt and Argillite	250,000 tonnes per annum
North of project	Northern Rivers Quarry & Asphalt	Blakebrook	Basalt	600,000 tonnes per annum
North of project	Corndale	Corndale	Basalt	Unknown

Acquisition of land used for quarrying would result in a change in land use from quarry uses to transport corridor. However, where property acquisition affects part of the property only and the project does not impact on that area of land used for quarry operations, the quarry would continue. RMS would continue to consult with quarry operators about changes to access arrangements.

**Table 4-6 Quarries impacted by the project**

Quarry name	Location	Project section	Quarried material	Impacted area (hectares)
Lot 120 DP 751365 (Jefferies, Firth Heinz Road)	Tucabia	Section 3	Unknown	3.7
Lot 2 DP 1096808 (Gittoes, McGeary's Pit)	Broadwater	Section 9	Chert	1.5
Lot 4 DP 253906 Betula Pty Ltd, Woodburn	Broadwater	Section 9	Chert	5.5
Lot 3 DP 619233 (Gittoes, McGeary's Pit)	Broadwater	Section 9	Chert	5.9
Lot 5 DP 843369 (Ballina Shire Council, Eatons)	Bagotville	Section 10	Sand	6.2
Lot 2 DP 585377 (Gibson Brothers)	Bagotville	Section 10	Sand	1.8
Lot 1 DP 787102 (Montis)	Bagotville	Section 10	Sand	1.7

Figure 4-1 Quarry land impacted at Tucabia

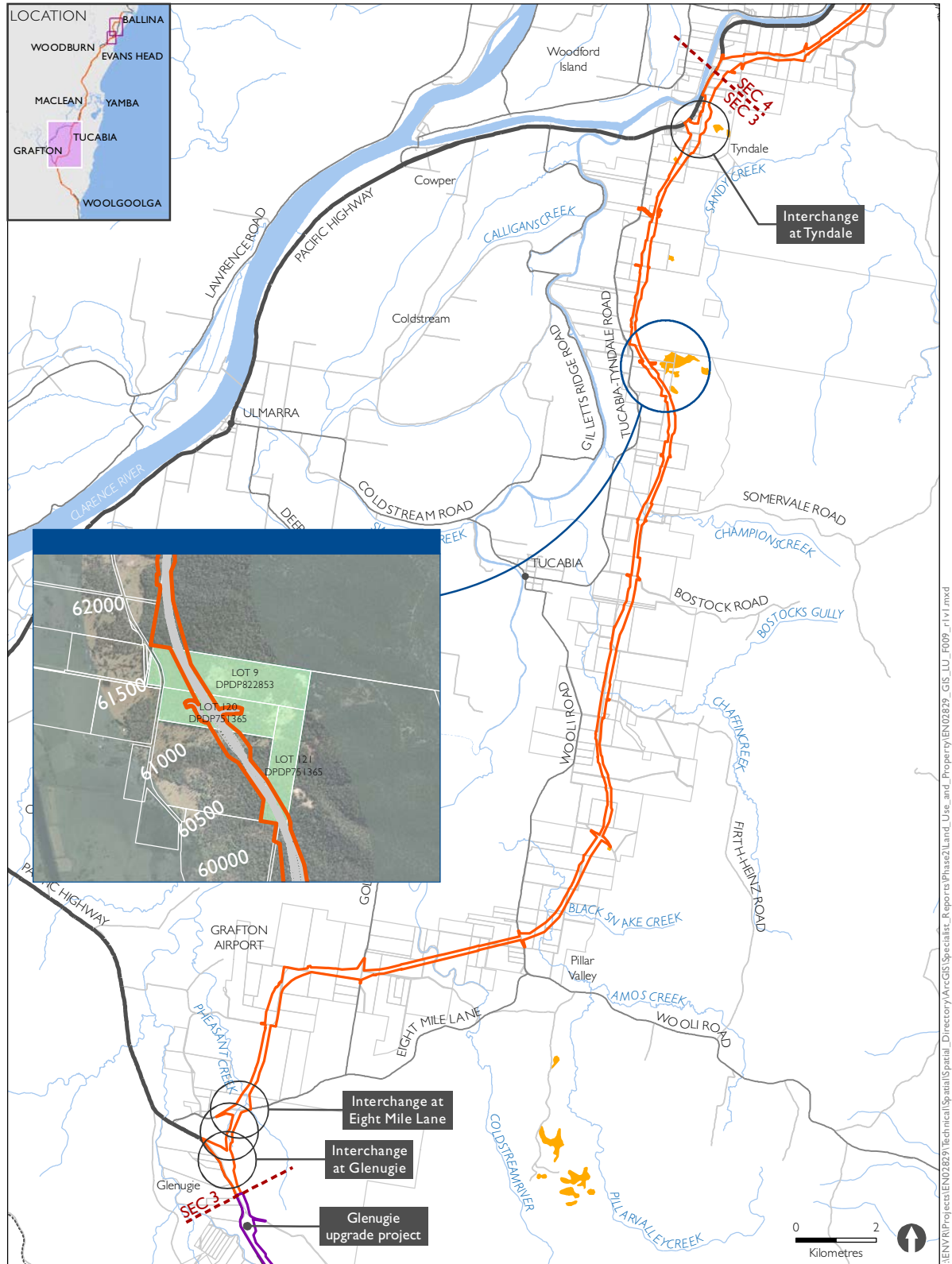
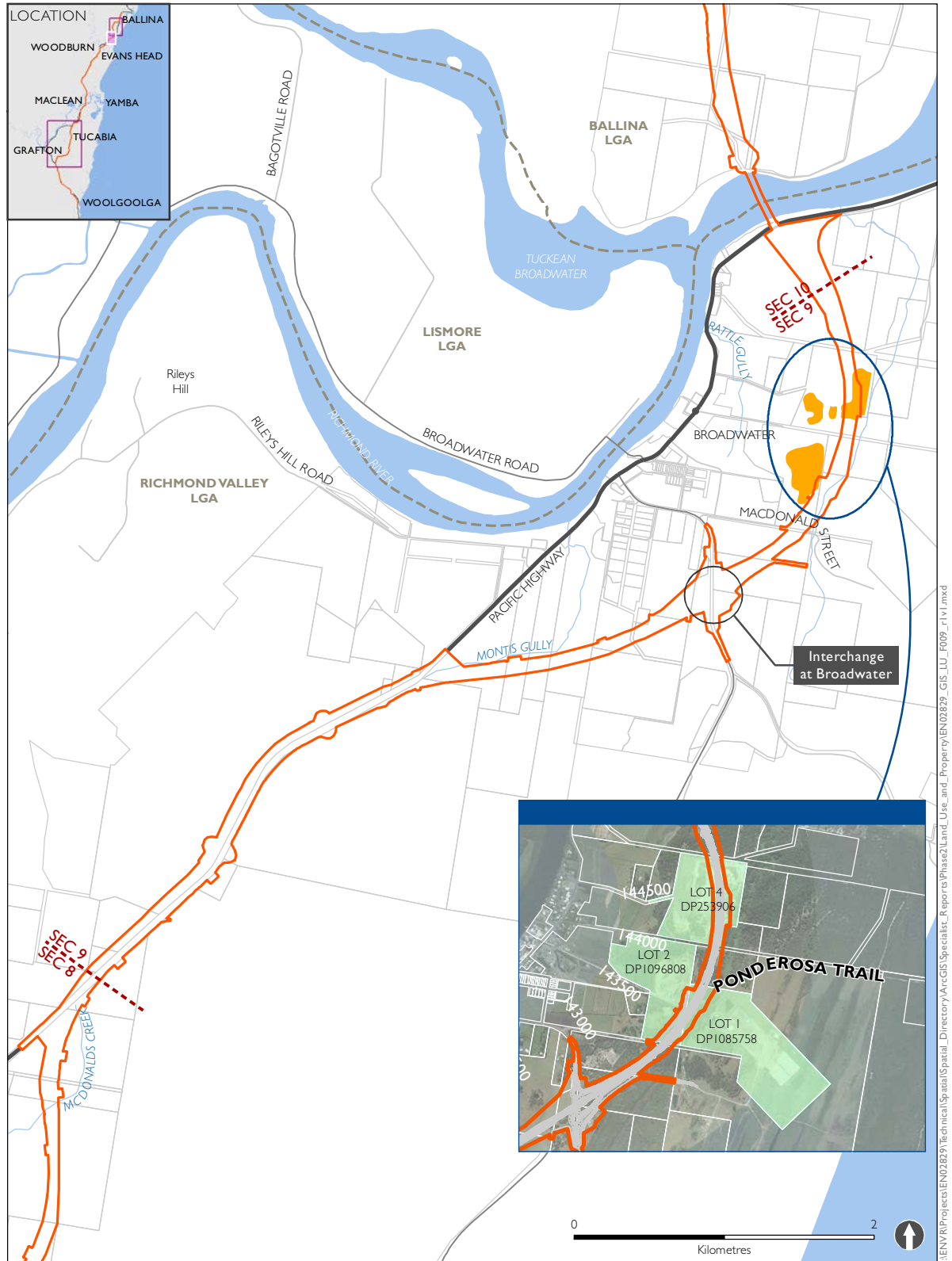


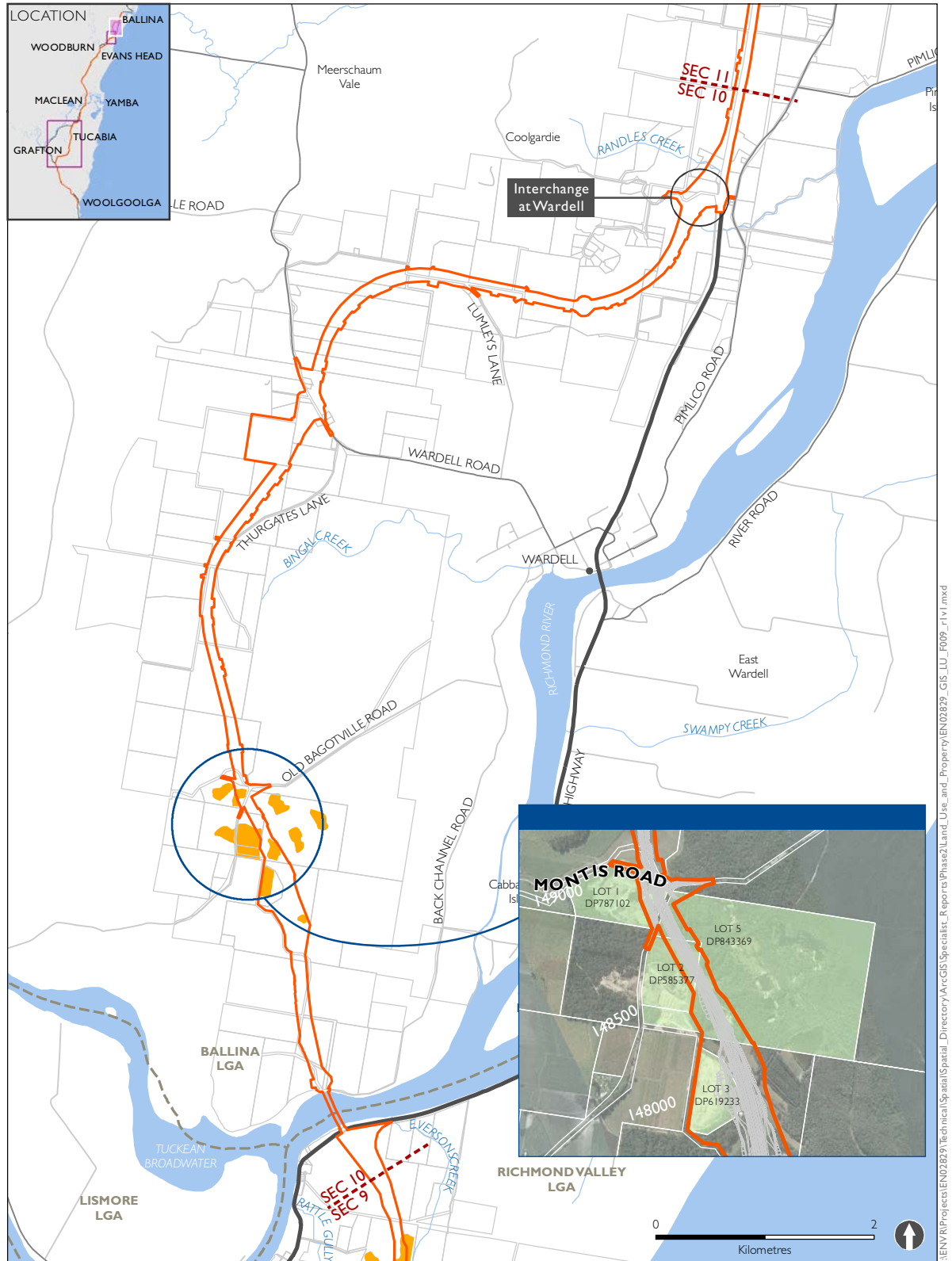


Figure 4-2 Quarry land impacted at Broadwater



- The project
- Upgrade completed to dual carriageway
- Upgrade under construction
- Existing Pacific Highway
- Mining & Quarrying land use
- Directly affected quarries

Figure 4-3 Quarry land impacted at Bagotville



- The project
- Upgrade completed to dual carriageway
- Upgrade under construction
- Existing Pacific Highway
- Mining & Quarrying land use
- Directly affected quarries

In addition to the seven properties available or used for quarry uses located on land within the project boundary, there are several properties comprising quarrying uses located within about one kilometre of the project boundary. Quarries located near the project are listed in Table 4-7. Potential impacts may occur for these quarry operations due to restrictions of some activities such as blasting. This may require a change in the operations and management of these quarries.

**Table 4-7 Quarries located near the project**

Quarry name	Location	Project section	Quarried material	Approximate distance from road boundary
Corbett	Tyndale	Section 3	Sandstone	1,000 metres
Campbells	Broadwater	Section 9	Chert and coastal sand	230 metres
Stokers	Ballina	North of the project	Shale	1,000 metres

Overall, the project would improve access for quarries across the wider region. Locally, access would be provided to the upgraded highway at interchanges, either via the existing highway or service roads established for the project.

### Construction

Prior to construction, acquisition of land would in the first instance be subject to negotiation between the landholder operating the quarry and RMS, in accordance with RMS's *Land Acquisition Policy* and the *Land Acquisition (Just Terms Compensation) Act 1991*. Regard would be given to the resource potential of the site in terms of land acquisition, and it is likely to be RMS's intention that resources available from acquired property would be utilised wherever possible in construction of the upgrade. In particular, there would be an opportunity to use sand from acquired quarry land near Bagotville in Section 10 of the project.

During construction, potential impacts on quarries near the project would generally relate to changes in access arrangements and potential restrictions on some quarrying activities, such as blasting, near to construction works.

RMS would continue to consult with quarry operators about changes to access arrangements during construction and about possible restrictions on activities such as blasting, to identify potential impacts and appropriate mitigation measures. This is of particular concern in sections 9 and 10 of the project around Broadwater (to the north and west of Broadwater Quarry Road and Rifle Range Road) and Bagotville (to the west and south of Old Bagotville Road and south of Montis Road).

Potential economic impacts associated with the demand for quarried materials during construction are discussed in Working paper – socio-economic.

#### 4.5.3. State forests

Potential project impacts on land used for State forest include direct impacts associated with the loss of State forest and indirect impacts, such as changes in access.

## Operation

The project would directly impact on six State forest areas along the length of the project. This would require the acquisition of about 204 hectares of State forest land. The acquisition of State forests would be undertaken in accordance with the *Forestry Act 1916*.

State forests impacted by the project, including the area affected, description of works and forest management zones are outlined in Table 4-8.

**Table 4-8 State forest impacted by the project**

State forest	Project section	Affected area (hectares)	Description of works	Forest management zones
Wedding Bells State Forest	Section 1	6.0	Loss of forestry land due to widening of existing highway corridor and construction of new access road connecting Sherwood Creek Road.	Zone 3a – harvesting exclusions zone Zone 4 – general management zone Zone 7 – non forestry use zone Zone 8 – areas for further assessment
Newfoundland State Forest	Section 1	44.5	Loss of forestry land due to widening of existing highway corridor	Zone 3b – special prescription zone Zone 4 – general management zone Zone 8 – areas for further assessment
	Section 2		Loss of forestry land due to widening of existing highway corridor and construction of a new access roads to connect the Pacific Highway service road to Bald Knob Tickgate Road and Franklins Road under the class M arrangement. Impact to around 40 hectares of Wells Crossing Flora Reserve from realignment of the upgrade to the east of the existing highway. Widened medians would retain vegetation and provide fauna connectivity via dedicated crossings between STN 22.5 and 23.8.	Zone 1 – special protection zone

State forest	Project section	Affected area (hectares)	Description of works	Forest management zones
Glenugie State Forest (excluding part of corridor within Glenugie upgrade project)	Section 3	98.0	Loss of forestry land due to widening of existing highway corridor, construction of new interchanges at Glenugie and Eight Mile Lane, and realignment of highway north of Glenugie interchange.	Zone 3a – harvesting exclusions zone Zone 3b – special prescription zone Zone 4 – general management zone Zone 8 – areas for further assessment
Pine Brush State Forest	Section 3	16.4	Loss of forestry land due to the new corridor alignment	Zone 3a – harvesting exclusions zone Zone 4 – general management zone Zone 8 – areas for further assessment
Mororo State Forest	Section 6	1.9	Loss of forestry land due to the new corridor alignment	Zone 3a – harvesting exclusions zone Zone 3b – special prescription zone Zone 8 – areas for further assessment
Tabbimoble State Forest	Section 7	6.3	Loss of forestry land due to widening of existing highway corridor and minor realignment of small sections	Zone 3a – harvesting exclusions zone Zone 3b – special prescription zone Zone 8 – areas for further assessment
Doubleduke State Forest	Section 7	31.1	loss of forestry land due to widening of existing highway corridor and minor realignment of small sections	Zone 3a – harvesting exclusions zone Zone 3b – special prescription zone Zone 4 – general management zone Zone 8 – areas for further assessment

The acquisition of State forest land would result in a change in land use to transport corridor.

State forests are managed for multiple uses including timber harvesting, recreation, bee keeping and conservation and are occasionally leased for grazing

Access to State Forests has been maintained through the local road network and the provision of the service road along motorway sections of the project. In many cases, forest roads run along the current boundary of the forests.

At some locations, small parcels of land would need to be acquired for the project, and adjacent forest roads may be impacted. Roads, access tracks and fire trails in State forests likely to be affected by the project include:

- Section 1: Arrawarra Beach Road, Sherwood Creek Road (Wedding Bells State Forest), Dunmar Lane (Newfoundland State Forest)
- Section 2: Bald Knob Tick Gate Road, No 2 Fire Road, Lookout Road (Glenugie State Forest)
- Section 3: Dungal Road, Eight Mile lane, No 1 Fire Road, Shields Road (Glenugie State Forest)
- Section 6: Mororo Firetrail (Mororo State Forest)
- Section 7: Cypress Road, Darkys Road, South Pacific trail, North Pacific Trail, (Doubleduke State Forest), Glencoe Road, McFayden Road, Serendipity Road, (Tabbimoble State Forest)

Further unnamed access tracks and trails are also expected to be affected during construction of the project. However, the detail of this impact is only likely to emerge during detailed design. These details will need to be addressed with NSW Forests at that time through appropriate consultation and planning. Providing alternative access arrangements would be required, and will depend on construction details.

For most State forests, the area of land impacted is situated adjacent to the existing Pacific Highway and would occur from the widening of the highway. This would assist in minimising potential impacts on the use and operation of the State forest. However, the realignment of the highway between Glenugie and Tyndale would result in the highway being located along the western boundary of Pine Brush State forest, located north east of Tucabia. The location of the corridor along the western boundary of the State forest would help to minimise impacts on the use and operation of the State forest.

The existing Pacific Highway currently forms the eastern boundary of the Mororo State forest. The minor realignment of the project to the west would result in the encroachment of the project into the State forest. This is not expected to impact on the use or operation of the State forest.

During consultation for the project with the Department of Primary Industries, a number of issues were identified in relation to the continued operation of the State forests affected by the project. These mainly related to changes in access to the State forests and the need to ensure that service roads allow for B-double trucks. Access would be maintained to the State forests via new service roads or the existing Pacific Highway, where the Pacific Highway is realigned. These would allow continued use by B-double trucks.

Issues were also raised by the Department of Primary Industries about the impact on fire trails within those areas of state forest to be acquired. Fire trails impacted by the project would be relocated in consultation with the Department of Primary Industries.

Further discussion about changes to local access is provided in the Working paper – Traffic and transport.

## **Construction**

During construction, potential impacts on areas of State forest may result from the temporary use of land for construction activities such as construction compounds or temporary sedimentation basins. Table 4-9 provides a summary of construction impacts for State forests.

**Table 4-9 Summary of construction impacts on State forests**

State forest	Project section	Summary of impacts
Wedding Bells State Forest	Section 1	<p>Construction activities for the project near Wedding Bells State Forest would generally occur within the area identified for the operational footprint.</p> <p>A number of temporary detention basins are required for construction in this area. While some of these are located within the operational footprint for the project, two basins for the construction on the local access road would be located outside of this footprint, while three construction basins would be partly outside of the operational footprint.</p> <p>This would result in the temporary disruption to forestry uses in that area covered by the basins. Following construction, the disturbed areas would be rehabilitated and reinstated for forestry use.</p> <p>There are no ancillary sites outside of the operational footprint within the Wedding Bells State Forest.</p>
Newfoundland State Forest	Section 1	Construction activities for the project near the Newfoundland State Forest would occur within the operational footprint area. This includes temporary construction basins required for construction.
	Section 2	
Glenugie State Forest (excluding part of corridor within Glenugie upgrade project)	Section 3	Construction activities for the project in Glenugie State Forest would mainly occur in the operational footprint area. However, a small ancillary site is located outside of the operational footprint south of the proposed interchange at Glenugie. This is located on land to be acquired for the project located between the existing Pacific Highway and the realigned highway.
Pine Brush State Forest	Section 3	Construction activities for the project near the Pine Brush State Forest would occur within the operational footprint area.
Mororo State Forest	Section 6	<p>Construction activities for the project near the Mororo State Forest would occur within the operational footprint area.</p> <p>Four temporary construction basins are identified in this area. These are partly located outside of the operational footprint for the project. This would result in the temporary disruption to forestry uses in that area covered by the basins. Following construction, the disturbed areas would be rehabilitated and reinstated for forestry use.</p> <p>There are no ancillary sites located in Mororo State Forest.</p>

State forest	Project section	Summary of impacts
Tabbimoble State Forest	Section 7	<p>Construction activities for the project near Tabbimoble State Forest would generally occur within the area identified for the operational footprint.</p> <p>A number of temporary detention basins are required for construction in this area. While some of these are located within the operational footprint for the project, a number of basins for the construction on the local access road would be located outside of this footprint, while three construction basins would be partly outside of the operational footprint.</p> <p>This would result in the temporary disruption to forestry uses in that area covered by the basins. Following construction, the disturbed areas would be rehabilitated and reinstated for forestry use.</p> <p>There are no ancillary sites outside of the operational footprint within the Tabbimoble State Forest.</p>
Doubleduke State Forest	Section 7	<p>Construction activities for the project near the Doubleduke State Forest would generally occur within the area identified for the operational footprint.</p> <p>Four temporary detention basins are required for construction in this area. Three of these partly extend beyond the operational footprint for the project. This would result in the temporary disruption to a small area of forestry uses in the area covered by the basins. Following construction, the disturbed areas would be rehabilitated and reinstated for forestry use.</p> <p>There are no ancillary sites outside of the operation footprint within the Doubleduke State Forest.</p>

The location of any temporary construction sediment basins in State forests would be subject to consultation with Forests NSW during detailed design.



## 4.6. Commercial fishing and aquaculture

Construction and operation of the project would not directly impact through acquisition commercial fishing operations or oyster priority areas and would not require the acquisition of individual oyster farms or priority areas. The bridges have also been designed to minimise long-term impacts on river users. However, indirect impacts may occur during construction and operation from major bridges over the Clarence River at Harwood and the Richmond River at Broadwater and works near to waterways.

In particular, works within the Clarence and Richmond rivers (ie for construction of piers, etc) would require temporary restrictions to boat movements near construction activities, potentially causing disruption and impacts on access for river users, including commercial fishing operations (eg prawn trawlers).

In terms of fishing impacts, these impacts could include:

- The potential to snare nets by construction vessels, plant and equipment becoming entangled in trawl nets and fishing lines
- Restricting access to trawlers and recreational fishers when construction vessels are manoeuvring or working in-stream
- Impacts to water quality and habitat for prawn stocks from potential disturbance to acid sulphate soils, sediment laden runoff and potential black ooze generation. Further impacts regarding water quality are described in Chapter 9 (Soils, sediments and water quality) of the EIS.

In particular, consultation regarding the duration and timing of construction access would be required prior to and during construction of the bridge crossing of the Clarence River with NSW Department of Primary Industries (Fisheries). Consultation is also proposed with licensed operators using the Clarence River estuary prawn trawl fishery, and estuary general fishery. In particular, prawn stocks including school prawns caught using prawn set pocket nets would be potentially sensitive to construction impacts.

Similarly, consultation regarding construction of the bridge crossing of the Richmond River would be required with licensed recreational fishing and boating groups to manage and provide information about construction activities, particularly river access. On-going consultation and communication with river users, including commercial fishing operators about construction activities, including the timing and duration of construction activities within the rivers, would assist in managing potential impacts for these users. The bridges have been designed to minimise long-term impacts on river users.

Potential impacts on fishery and oyster priority areas may occur due to increased sedimentation and run-off during construction and operation potentially impacting on the water quality of rivers and other waterways. Without mitigation, impacts on waterways downstream of the project could have an adverse impact on the health of aquatic environments and key fish habitats, including loss of biodiversity, reductions in populations of species and or loss of species. The implementation of environmental management measures would assist in minimising potential impacts on waterways such as the Clarence and Richmond rivers. In particular, temporary construction basins would be established during construction to capture stormwater run-off from earthworks and prevent this entering rivers and waterways. Permanent stormwater detention basins would be established along the project to capture and treat stormwater runoff prior to it being released into the environment.

This would reduce the risks to water quality associated with project run-off. Potential impacts of water quality changes from the project on key fish habitats are further discussed in the Working paper – Water quality.

## 4.7. Infrastructure and utilities

The project would impact on infrastructure and utilities across the study area, including electricity transmission, telecommunications, water supply and sewerage infrastructure, including through adjustment to existing services, relocation of some services where they cross the highway or the implementation of protection measures would be required. No impacts on infrastructure or utilities are expected outside of the project corridor.

The relocation or adjustment of infrastructure and utilities for the project may result in some temporary disruptions for near neighbours during these works. However, careful planning would ensure these disruptions are minimised and impacts are appropriately managed. This includes communication with nearby communities about the timing and duration of potential disruptions.

Land required for the Broadwater Sewerage Scheme rising pump station would be affected by the project. A rising main is to be constructed on local government owned land adjacent to Broadwater-Evans Head Road. The main would exit the pump station and travel along Broadwater-Evans Head road towards Evans Head. The location of this main would be considered during the detailed design of the project in terms of the project's horizontal alignment. Alternatively, a utility adjustment would be considered, as appropriate. Consultation with Richmond Valley Council would be required regarding the timing of construction of both the rising main and the project.

The project would affect a conveyor used by the sugar mill at Broadwater (owned by the NSW Sugar Milling Co-operative Ltd). An overhead protection structure would be required where the conveyor passes over the proposed upgrade. This is not expected to affect the mill operations in the longer term, but temporary disruption may occur to the conveyor during construction. Land in the ownership of the co-operative would also be acquired to construct the project, including land to the north of Broadwater Quarry Road. With the overhead protection structure in place, the project is not expected to affect the operation of the sugar conveyor supplying the sugar mill at Broadwater.

The project traverses the catchment for the Rous Water borefield at Woodburn. The project is located on fill embankment in this general area. Impacts on the borefield from the project's construction and operation and would be mitigated through the implementation of storm water management measures and detailed design. Potential impacts on the borefield are further discussed in the Working paper - Groundwater. Table 4-10 provides a summary of the impacts on infrastructure (as supplied by service providers) within each section of the project. On-going consultation would be undertaken with service providers during the detailed design to verify locations and specific impacts on infrastructure and utilities.

**Table 4-10 Summary of impacts on infrastructure and utilities.**

Project section	Location	Summary of impacts on infrastructure and utilities
1	Woolgoolga to Halfway Creek	<ul style="list-style-type: none"> <li>Electricity – adjustments are required at various locations to the location of power poles and overhead transmission lines for the Essential Energy 11 kV transmission line</li> <li>Telecommunications – relocation or protection of the main copper cable lines and optic fibre cable at various locations. Construction of new optical fibre cable is required at Dirty Creek</li> </ul>

Project section	Location	Summary of impacts on infrastructure and utilities
		<ul style="list-style-type: none"> <li>Water and sewer – protection of water and sewer mains is required where these cross the project.</li> </ul>
2	Halfway Creek to Glenugie upgrade	<ul style="list-style-type: none"> <li>Electricity – adjustments are required to the location of power poles for the Essential Energy 11 kV transmission line near Halfway Creek.</li> </ul>
3	Glenugie upgrade to Tyndale	<ul style="list-style-type: none"> <li>Telecommunications – protection of the optic fibre cable is required south of the proposed interchange at Glenugie.</li> </ul>
4	Tyndale to Maclean	<ul style="list-style-type: none"> <li>Electricity – protection or relocation is required for the Essential Energy 66 kV transmission line.</li> <li>Water and sewer – protection of the water main and rising sewer main is required near to the proposed interchange at Maclean.</li> </ul>
5	Maclean to Iluka Road, Mororo	<ul style="list-style-type: none"> <li>Telecommunications – relocation or protection of the optic fibre cables is required at various locations in this section.</li> </ul>
6	Iluka Road to Devils Pulpit upgrade	<ul style="list-style-type: none"> <li>Telecommunications – protection of the optic fibre cable is required where this cross the project.</li> </ul>
7	Devils Pulpit upgrade to Trustums Hill	<ul style="list-style-type: none"> <li>Electricity – relocation of power poles and cables for the Essential Energy 11 kV transmission line are required at various locations in this section.</li> </ul>
8	Trustums Hill to Broadwater National Park	<ul style="list-style-type: none"> <li>Electricity – relocation of power poles and/or overhead cables for the Essential Energy 11 kV transmission line are required at various locations in this section, and adjustment required to the Essential Energy 66 kV cable where this crosses the project</li> <li>Telecommunications – relocation, adjustment and/or protection of the optic fibre cable and adjustment and/or protection of the copper cable are required at some locations in this section</li> <li>Water and sewer – protection of water mains are required in this section, including the Rous Water Authority truck water main north of Woodburn, and relocation of the sewer rising main north of the Woodburn Evans Head overpass. The project traverses the catchment of the Rous Water borefield located east of Woodburn. Impacts on the borefield from the construction and operation of the project would be managed during construction.</li> </ul>
9	Broadwater National Park to Richmond River	<ul style="list-style-type: none"> <li>Electricity – adjustment of the overhead cable and relocation or protection of power poles for the county Energy 11 kV transmission line is required at various locations. This includes undergrounding the cable where this crosses the alignment</li> <li>Telecommunications – protection of the copper cable is required in some locations and relocating underground the copper cable near Tuckombil Road.</li> <li>Water – protection is required of the Rous Water Authority truck water main as well as protection and relocation under the highway of this water main where it crosses the project.</li> </ul>
10	Richmond River to Coolgardie Road	<ul style="list-style-type: none"> <li>Electricity – adjustment of the overhead cable for the Essential Energy 11 kV transmission line is required at various locations. Undergrounding the existing overhead cable is also required near the Richmond River. Adjustments are also required to power supplies to some existing properties, including adjusting overhead power to new underground supply</li> <li>Telecommunications – protection of the copper cable and optic fibre cable is required in some locations. Undergrounding the optic fibre cable under the new Richmond River bridge or highway is</li> </ul>

Project section	Location	Summary of impacts on infrastructure and utilities
		also required <ul style="list-style-type: none"> <li>• Water – protection of the Ballina Shire Council water main is required where this crosses the project.</li> </ul>
11	Coolgardie Road to Ballina Bypass	<ul style="list-style-type: none"> <li>• Electricity – adjustment to the overhead cable and relocation of power poles required for the Essential Energy 11 kV transmission line. Undergrounding the existing overhead cable is also required where this crosses the project</li> <li>• Telecommunications – undergrounding of the optic fibre cable and protection of the copper cable is required in some locations.</li> <li>• Water – protection of the water main is required where this crosses the Woodburn Evans Head Road.</li> </ul>

## 5. Mitigation and management of impacts

Impacts on land use and property have been avoided, where possible, through refinements to the project design, such as:

- Refinements to the alignment to minimise potential impact on areas of high value agricultural uses (ie at Shark Creek)
- Establishment of local access roads or additional service roads
- Refinements to local roads where they are crossed by the project so as to maintain the function of the local network in serving land use either side of the alignment
- Adjustments to numerous internal property access arrangements where they are directly affected by the project
- Acquisition of the whole or part of the properties affected by the project in accordance with RMS's Land Acquisition Policy
- Provision of vehicle underpasses
- Provision of stock and person access by underpasses.

The following provides an overview of measures for avoiding, managing or mitigating the potential land use and property impacts of the project's construction and operation.

### 5.1. Land use management framework

#### 5.1.1. Broad objectives

The broad objectives of the project for managing potential land use impacts are:

- Minimise impacts of the project on private property
- Minimise impacts of the project on regionally significant farmland
- Ensure the project supports land use and planning goals for the Far North and Mid North Coast regions of NSW.

### 5.1.2. Applicable guidelines

Consultation with landowners, local communities and business about the project would be undertaken in accordance with the following legislation, policies and guidelines:

- *Land Acquisition (Just Terms Compensation) Act 1991 (NSW)*
- *Land Acquisition Policy (RTA, 1999)*
- *Mid North Coast Regional Strategy (Department of Planning, 2009)*
- *Far North Coast Regional Strategy (Department of Planning, 2006).*

## 5.2. Property acquisition

Acquisition of land would in the first instance be subject to negotiation between the landholder and RMS, in accordance with RMS's *Land Acquisition Policy* and the *Land Acquisition (Just Terms Compensation) Act 1991*. This includes consideration to acquiring severed or isolated sections of land where access cannot be reasonably reinstated.

In acquiring the necessary property for construction of the project, the area would be based on the largest land take required for the class A or class M upgrade. This would allow all property ultimately required for the upgrade, interchanges and other associated infrastructure to be provided for. For example, acquisitions could be based on the inclusions of the full length of a service road along the alignment, even though this may not be initially constructed under class A.

Acquired land not required for the project, would generally be made available for disposal by public auction or tender. A remnant land and property strategy has been prepared for the project to identify options for surplus property (outlined in Section 5.5.1).

The land acquisition strategy for the project seeks to address issues of land severance and sterilisation. Land which is severed or sterilised has been identified for potential acquisition. Rectification of land severance could then occur through amalgamating residual land and creating new accesses to affected properties and/or rehabilitating surplus land for sale (or transfer of ownership) to off-set loss of similar land in parts of the study area.

Measures to be implemented in relation to property acquisition include:

- Undertake on-going communication and consultation with directly affected property owners about the property acquisition process. This includes the provision of information on the timing of acquisitions, the process for property acquisitions under the *Land Acquisition (Just Terms Compensation) Act 1991* and *RMS's Land Acquisition Policy (RTA, 1999)*
- Undertake on-going consultation with directly affected property owners during the detailed design phase to identify measures to mitigate potential impacts on the use and viability of land. This could relate to matters such as adjustments to fencing, property access, farm infrastructure and relocation of impacted ancillary structures, as required
- Complete property adjustments for fencing, access tracks, cattle underpasses and other farm infrastructure in consultation with the impacted land owner

- Rehabilitate surplus residual land for sale (or transfer of ownership) to off-set loss of similar agricultural land
- Minimise sterilisation and severance of land uses and lots by amalgamating severed parcels of land together, where possible, with provision of road access
- Where required, undertake acquisition of State forests in accordance with the provisions of the *Forestry Act 1916* and revocation of land dedicated or reserved as national parks or nature reserves would be in accordance with the *National Parks and Wildlife Act 1974*. Acquisition of land owned by Local Aboriginal Land Councils would be in accordance with the provisions of the *Aboriginal Land Rights Act 1983*.

### 5.3. Operational impacts

Recommended strategies to manage potential impacts on land use and property from the operation of the project include:

#### 5.3.1. Property

- Ensure RMS owned land that is required for the class M alignment is appropriately maintained. This would be undertaken by regional RMS officers or a designated local authority. RMS would take responsibility for the leasing and maintenance of property identified as suitable for tenants. This would be managed by RMS.

#### 5.3.2. Primary industry, including forestry, agriculture and aquaculture uses

- Undertake on-going consultation with owners of agricultural properties affected by the project – through acquisition, changes to local access or fragmentation of properties – about potential impacts on the use and viability of farming operations and potential measures to manage or mitigate identified impacts
- Consult with Department of Primary Industries regarding access to and within State forests where required, in accordance with the *Forestry Act 1916*
- Consult with Department of Primary Industries about the relocation of fire trails directly impacted by the projects construction or operation
- Revegetate land, particularly where on-going agricultural viability is limited and there are ecological and/or landscape opportunities
- Identify suitable locations for relocated cane pads in consultation with cane growers and affected property owners
- Implement environmental management measures to capture stormwater run-off from construction activities and prevent this entering rivers and waterways

- Communicate any changes to river access near the proposed bridges over the Clarence and Richmond rivers to commercial fishing operators and other boat users.

### **5.3.3. Property access**

- Reinstate property accesses that are lost as a result of the project in consultation with impacted landowners
- Identify internal access arrangements with landowners to maintain the long term viability of the property.

### **5.3.4. Mining, quarrying and petroleum production**

- Undertake on-going consultation with land owners operating quarries within the project boundary and adjacent to the project, including those near Tucabia, Tyndale, Broadwater and Bagotville, and relevant NSW State government agency. Consultation would aim to identify appropriate management measures required due to the realignment of the project near to operational quarries. In particular, management arrangements would be determined for each affected quarry, particularly regarding operational approvals in terms of site access, extraction limits, blasting limits, timing of works, noise and vibration
- Undertake on-going consultation with the coal seam gas proponents operating in the study area and relevant NSW State government agency to ensure that impacts on the project and on the future coal seam gas production are minimised.

### **5.3.5. Utilities and infrastructure**

- Undertake on-going consultation with service providers to verify specific impacts on infrastructure and utilities.

## **5.4. Construction impacts**

Recommended strategies to manage potential land use and property impacts during construction include:

### **5.4.1. Property access**

- Maintain access to properties near construction works, including where required, for the movement of farm equipment and livestock between properties
- Where temporary changes to property access are required during construction, alternate access should be determined in consultation with affected property owners and tenants



- Undertake on-going communication with local communities about changes to the local road network, including likely delays and disruptions and alternate accesses if required.
- Ensure that excavation works near lot 7008 and DP92609 are carefully managed to minimise potential impacts on any unknown heritage items.

#### **5.4.2. Local amenity**

- Undertake early and on-going consultation and communication with residents and local communities closest to construction works about construction activities, including timing, duration and likely impacts. This will be particularly important where works are proposed outside of standard daytime construction hours.

#### **5.4.3. Primary industry, including forestry, agriculture and aquaculture uses**

- Develop a spoil management plan to manage surplus spoil from construction. Where possible, onsite re-use of any spoil is the preferred solution for managing the impacts, although alternative options for the reuse or disposal of spoil would be identified in the management plan
- Consider opportunities for the productive use of trees removed for the project, including ancillary facilities where necessary
- Implement environmental management measures to minimise potential for impacts on adjoining agricultural uses, including from changes in water quality and spread of weeds and pests
- Where pesticides are required during construction, implement appropriate environmental management measures to avoid potential impacts on adjoining agricultural properties
- Undertake on-going consultation and communication with managers of agricultural properties to identify any potential impacts for nearby construction workers from farm operations (ie use of pesticides on agricultural properties)
- Undertake on-going consultation and communication with commercial fishing operators about construction activities near the Clarence and Richmond rivers, including the timing and duration of construction, potential impacts and proposed mitigation measures.
- Establish stormwater detention basins to capture and treat stormwater run-off prior to it being released into the environment.

#### **5.4.4. Utilities and infrastructure**

- Where relocation or adjustment of infrastructure is required, these should be planned to minimise disruptions and impacts to surrounding properties

- Communicate with nearby communities about timing and duration of potential disruptions to infrastructure
- Consult with Richmond Valley Council regarding the timing and location of the Broadwater Sewerage Scheme rising pump station. The location of the rising main should inform the detailed design of the project's horizontal alignment near Broadwater-Evans Head road, or the potential requirement for a utility adjustment.

## 5.5. Remnant land and property strategy

The remnant land and property strategy applies to parcels of land that are to be acquired for the project. The overall aim of the strategy is to promote appropriate final land uses on lands directly affected by the project.

### 5.5.1. Remnant land strategy principles

Issues to be considered when addressing remnant land and determining to what extent it is operational or functioning for a specific type of alternative land use include:

- Size of the residual land area(s)
- Access to the residual land
- Requirements to avoid land use conflict
- Loss of dwelling entitlement
- Loss of major income producing activity
- Need for ancillary work sites during construction.

While RMS aims to acquire only that property necessary for the project, occasionally a total property is purchased despite only part of it being required. This occurs when the effect of the proposed road on the remaining property is considered significant such that it warrants total purchase. While some properties in the land use assessment have been identified as 'materially affected' and have been identified as needing total acquisition, despite not being totally required for the project, it is possible that others would result in total acquisition once more detailed discussions are held between RMS and landowners.

Any property not required for the project is ultimately considered surplus. This property would be, wherever economic, leased until it is disposed of by RMS. Leasing surplus property until its sale or shortly before its sale means that it is not sterilised from economic use.

Sale of surplus property would occur after project completion when the final corridor is precisely confirmed based on a survey of the constructed road and peripheral infrastructure. To ensure probity, residual property is almost always offered for sale on the open market. One of the exceptions to this is where a landlocked parcel exists that has only one adjoining owner and therefore potential purchaser. In this instance a public marketing campaign is unlikely to be successful so direct negotiations with the adjoining owner may be made. All sales are informed by a current market valuation.

The timing of sale of the surplus property would be determined by RMS, but the guiding principles include ensuring that:

- All surplus property is released for sale in a timely fashion. RMS would not unnecessarily hold property that is not required for its activities
- RMS property disposals do not influence the local property market. If RMS owns a large quantity of surplus property in a single town or area it would stagger the sales, possibly

over a number of years, to ensure that the market is not flooded (which would lower prices for both RMS and private vendors)

- Property is not sold prematurely if value adding activities are needed to maximise the net return to RMS - it is likely that some of the surplus property would have unmarketable zoning, servicing deficiencies or access issues. Where a net gain can be demonstrated, RMS would seek to solve these issues prior to sale of affected surplus property.

In some cases, one or more of the deficiencies mentioned in point three above (usually access or servicing) would be unable to be economically rectified. If the property has access, it would be sold on the open market. If the property does not have access, consideration would be given to selling the property to one or more of the adjoining owner(s) or, if there are no adjoining owners or negotiations with adjoining owners fail, the land would be retained by RMS and consideration given to its suitability for a beneficial use.

#### **5.5.2. Plan for implementation**

The two key areas for the successful implementation of the strategy are cooperation from relevant government authorities and clear and consistent education and information provided to affected landowners. The relevant stakeholders involved with the implementation of the strategy are:

- Coffs Harbour City Council
- Clarence Valley Shire Council
- Richmond Valley Council
- Ballina Shire Council
- Department of Primary Industries
- National Parks and Wildlife Service
- Department of Planning and Infrastructure.

It is proposed that RMS would undertake consultation with the relevant authorities to:

- Outline the principles and obtain feedback on the remnant land and property strategy
- Ensure the highest and best use is sought for the residual land
- Identify the appropriate extent, location and nature of revegetation and restoration of riparian zones adjacent to watercourses
- Establish an informed working group to manage stakeholder engagement and community liaison.

## 6. Conclusions and summary

This report provides an assessment of potential land use and property impacts associated with the design, construction and operation of the Pacific Highway Woolgoolga to Ballina upgrade project. The assessment included:

- Describing and assessing the existing land use and property context of the study area, regional land uses and planning, and local land use near the project
- Providing an assessment of properties directly affected by the project
- Identifying measures to manage or mitigate the project's impacts on land use and property.

Overall, the project would provide a range of long term benefits, including improvements in road safety and regional access and connectivity. This would support future development, both locally and regionally, through improved access across the region, to major regional centres such as Coffs Harbour and Ballina and areas outside of the region such as south east Queensland, as well as to future development areas at Gulmarrad and Townsend, and potential development areas at Glenugie / Pillar Valley.

However, the project would have impacts on some individual properties and communities closest to the project, including from:

- Acquisition of about 564 properties, either totally or in part, and change in land use from uses such as agriculture, conservation, and extractive industries to transport infrastructure. These properties are owned by 381 individual landowners
- Changes in local access and connectivity between population centres
- Changes to property access, including for those properties adjacent to the existing Pacific Highway, due to restrictions on direct property access from the highway
- Potential severance and fragmentation of larger properties, particularly agricultural land uses, due to the location of the project
- Temporary disruption to the use of land impacted by construction activities, such as worksites and sedimentation basins
- The adjustment to existing services and infrastructure such as electricity transmission, telecommunications, water supply and sewerage infrastructure, or the relocation of some services where they cross the project or the implementation of protection measures.

The project would directly impact about 290 agricultural properties. While the loss of agricultural land and agricultural properties may be significant for individual farmers directly impacted and local farming communities, regionally, the amount of agricultural land acquired for the project is considered relatively minor, comprising approximately 0.2 per cent of total agricultural land in the region.

Some changes would be temporary in nature during construction, while some impacts would result in longer term changes to some individual properties and communities. These impacts would be managed through the implementation of appropriate land use strategies, on-going consultation, property acquisition and stakeholder engagement.

In particular, a remnant land use strategy has been developed to mitigate or manage the impacts on property and land use from the acquisition of land for the project, such as severance and fragmentation of agricultural properties.