

# NSW Roads and Maritime Services

## WOOLGOOLGA TO BALLINA | PACIFIC HIGHWAY UPGRADE ENVIRONMENTAL IMPACT STATEMENT

### MAIN VOLUME 1B

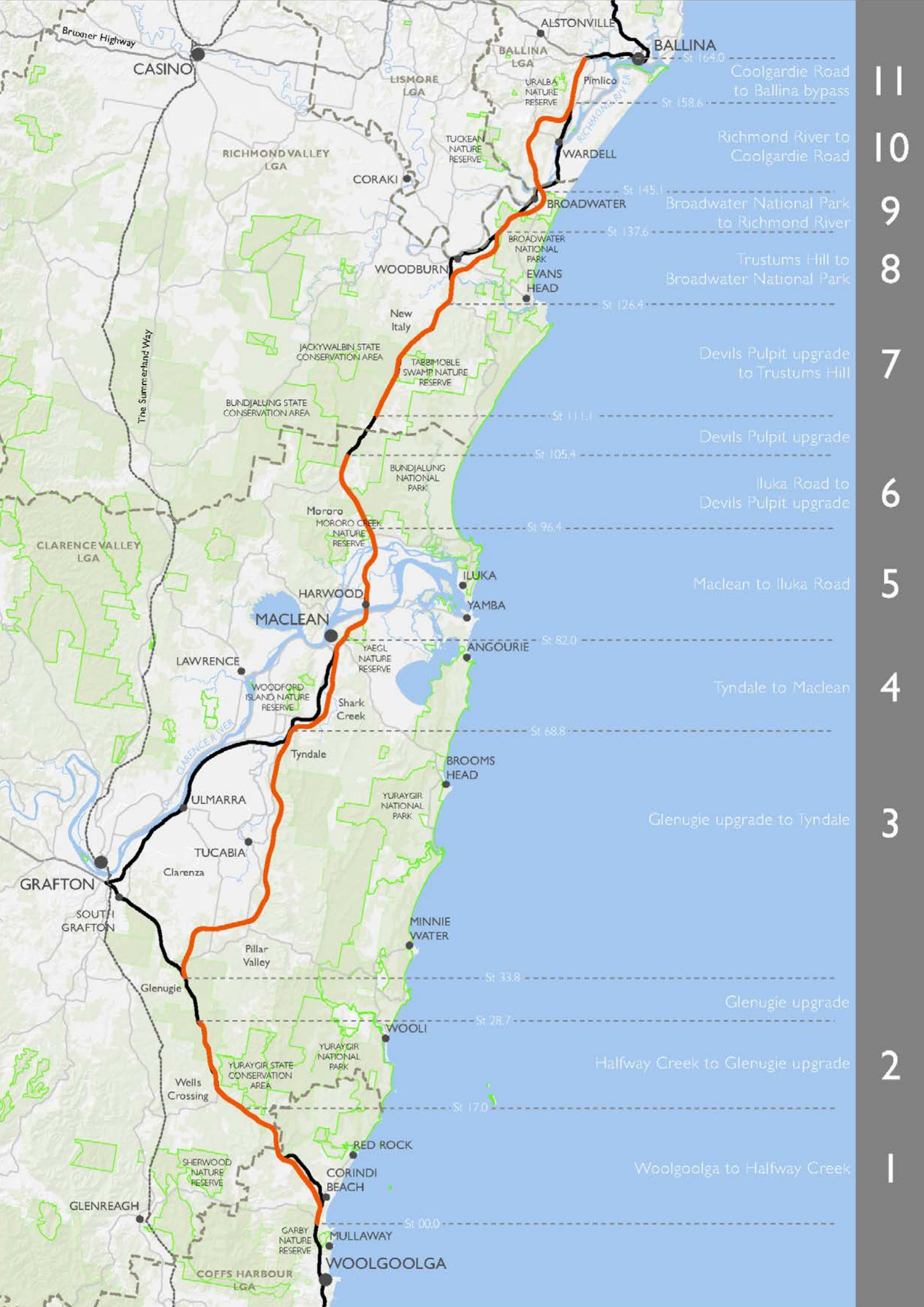
#### Chapter 16 – Land use and property

##### Chapter summary

This chapter assesses the potential impacts of the project on land use and property. The project would support future development, both locally and regionally, through improved access to major regional centres such as Coffs Harbour and Ballina and areas outside the region such as south-east Queensland. However, the project would have impacts on individual properties and communities closest to the project. These impacts would include:

- Acquisition of around 564 properties and changes in land use from agriculture, conservation, and extractive industries to transport infrastructure. This would affect around 381 landowners with 64 per cent of land acquisitions commenced (as of September 2012)
- In some sections, the project would duplicate the existing Pacific Highway (about 43 per cent of its length, or around 68 kilometres); in others it would deviate from it (about 57 per cent of its length, or around 87 kilometres)
- Demolition of a number of structures, including about 60 residences, outbuildings and sheds
- Changes in local access and connectivity between population centres
- Potential severance and fragmentation of larger properties, particularly agricultural land. Ninety six properties would be severed across the full project length (or 17 per cent of affected properties)
- Temporary disruption to the use of land due to construction activities
- Impacts to seven properties used for quarrying in Tucabia, Broadwater and Bagotville
- Impacts to about 25 farm dams from acquisition or changed drainage
- Adjustment to existing services and infrastructure.

These impacts would affect about 954 hectares of agricultural land, of which about 386 hectares of land is regionally significant farm land located across about 293 agricultural properties. No state significant farmland would be affected by the project. This loss may be significant for directly impacted farmers and communities. However, regionally, the amount of agricultural land acquired for the project is relatively small. About 204 hectares of State forest land would be acquired as part of the project. The project would change some State forest road networks, but overall state forest function would not be affected. About 30 hectares of Crown land would be acquired as part of the project. The overall functionality of Crown Land would be maintained. RMS has developed a remnant land use strategy to manage property and land use impacts from land acquisition within the project boundary, such as severance and fragmentation of agricultural properties.



# Contents

<b>16</b>	<b>Land use and property .....</b>	<b>16-1</b>
16.1	Assessment methodology .....	16-1
16.2	Existing environment .....	16-3
16.2.1	Overview of local and regional land use .....	16-3
16.2.2	Agricultural land.....	16-5
16.2.3	Commercial fishing and aquaculture.....	16-19
16.2.4	Conservation areas .....	16-20
16.2.5	Natural resources .....	16-23
16.2.6	Infrastructure and utilities .....	16-25
16.2.7	Land tenure .....	16-25
16.3	Assessment of impacts.....	16-25
16.3.1	Direct impacts on properties .....	16-25
16.3.2	Changes to property access .....	16-26
16.3.3	Land use and construction .....	16-26
16.3.4	Property infrastructure.....	16-27
16.3.5	Future land use and development potential .....	16-27
16.3.6	Property acquisition process .....	16-28
16.3.7	Property severance, fragmentation and sterilisation .....	16-28
16.3.8	Agricultural land.....	16-42
16.3.9	Fragmentation and severance of agricultural properties.....	16-43
16.3.10	Regionally significant farmland .....	16-44
16.3.11	Agricultural uses, food production, and rural industries .....	16-44
16.3.12	Agricultural diseases, quarantined properties and travelling stock reserves .....	16-45
16.3.13	National parks, reserves and conservation areas .....	16-46
16.3.14	State forests .....	16-47
16.3.15	NSW Government land .....	16-50
16.3.16	Natural resources .....	16-53
16.3.17	Commercial fishing and aquaculture.....	16-57
16.3.18	Infrastructure and utilities .....	16-58
16.4	Management of impacts .....	16-59
<b>References.....</b>		<b>16-64</b>

## Tables and Figures

Table 16-1: Property impacts and severance.....	16-30
Table 16-2: State forests impacted by the project.....	16-47
Table 16-3: NSW Government owned land.....	16-51
Table 16-4: Quarry land affected by the project.....	16-53
Table 16-5: Land use and property mitigation measures.....	16-60
Figure 16-1: Regionally significant farmland within the study area .....	16-6
Figure 16-2: Agricultural land uses near the project: Section 1 .....	16-8
Figure 16-3: Agricultural land uses near the project: Section 2 .....	16-9
Figure 16-4: Agricultural land uses near the project: Section 3 .....	16-10
Figure 16-5: Agricultural land uses near the project: Section 4 .....	16-11
Figure 16-6: Agricultural land uses near the project: Section 5 .....	16-12
Figure 16-7: Agricultural land uses near the project: Section 6 .....	16-13
Figure 16-8: Agricultural land uses near the project: Section 7 .....	16-14
Figure 16-9: Agricultural land uses near the project: Section 8 .....	16-15
Figure 16-10: Agricultural land uses near the project: Section 9 .....	16-16
Figure 16-11: Agricultural land uses near the project: Section 10 .....	16-17
Figure 16-12: Agricultural land uses near the project: Section 11 .....	16-18
Figure 16-13: National parks, conservation areas and State forests in the study area .....	16-22
Figure 16-14: Location of quarries in the study area.....	16-24
Figure 16-15: Quarries impacted at Tucabia.....	16-54
Figure 16-16: Quarries impacted at Broadwater .....	16-55
Figure 16-17: Quarries impacted at Bagotville .....	16-56



## 16 Land use and property

This chapter assesses the potential impacts of the project on land use and property. The Director General's environmental assessment requirements were addressed, as described below. The full assessment is provided in the Working Paper – Land use and property (SKM, 2012a).

Director-General's 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 16.3.1 Section 16.3.2 Section 16.3.3 Section 16.3.4 Section 16.3.5 Section 16.3.6 Section 16.3.7 Section 16.3.9
Impacts on 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 16.3.8 Section 16.3.9 Section 16.3.10 Section 16.3.11 Section 16.3.12
Impacts on the operation of State forest estate, including potential for fragmentation and sterilisation of resources, and access by forestry and other users.	Section 16.3.14
Impacts on Crown land, reserves and assets, and land reserved under the <i>National Parks and Wildlife Act 1974</i> .	Section 16.3.13 Section 16.3.15
Impacts on natural resources, including mining, petroleum production and extractive resources utilisation.	Section 16.3.16
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 16.3.17
Identification of services and utilities to be relocated.	Section 16.3.18

### 16.1 Assessment methodology

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

The study area for this assessment includes the area within the project boundary, which covers an area of around 2220 hectares.

The project boundary is generally around 150 metres wide, except at interchanges or areas of large cuttings or embankments. In these locations, the footprint is typically about 200 to 400 metres wide. The project boundary includes additional elements, such as local access roads, permanent water quality basins, and some ancillary facilities required during construction (eg compound sites, sedimentation basins). An additional 233 hectares outside of this project boundary would be required for ancillary facilities during construction.

This assessment also considered potential impacts of the project on 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.

## Existing environment

A description of the existing environment was developed to provide details of the existing planning, land use and property relevant to the project both locally and regionally. It included:

- A review of State, regional and local planning legislation, policies and strategies relevant to the project and study area (refer to Working paper – Land use and property)
- A review of existing land uses within the study area based on a desktop review of GIS (geographical information system) spatial data and aerial photography
- Identification of existing urban land uses. These include residential and rural residential uses, industrial/ commercial uses, and recreation and community uses
- Identification and review of existing agricultural uses. These include areas of regionally significant farmland; areas used for cropping, grazing and horticulture; existing stock routes; and agricultural infrastructure (eg irrigation and drainage, farm buildings, and cane pads – collection areas where the sugarcane is transported to the mill)
- 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 operation of the State forest estate, 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
- Review of land tenure, including areas of Crown land and property owned by Aboriginal Land Councils.

## Impact assessment and mitigation

The assessment of potential impacts on local and regional land use and property considered:

- Impacts on urban land uses, including future development areas
- Impacts on agricultural land from:
  - Property acquisition, resulting in loss of agricultural land, including regionally significant farmland
  - Changes to property access
  - Sterilisation and severance of agricultural land
  - Impacts on agricultural infrastructure such as irrigation and drainage infrastructure
  - Impacts on stock routes
  - Impacts from the potential introduction of stock and agricultural diseases
  - Impacts on conservation areas, including direct impacts from property acquisition, sterilisation and severance of property and indirectly from changes to access
  - Impacts on natural resource areas, including operation of the State forest estate, from property acquisition, fragmentation and sterilisation of resources, and changes to access
  - Impacts on commercial fishing and aquaculture operations
  - Impacts on directly affected properties. This involved identifying the number and tenure of properties totally or partially affected by the project; and the area of affected land uses
  - Impacts on the development potential of land partially impacted by the project or land adjoining the project boundary
  - Impacts on Crown land, including fragmentation and changes to access
  - Impacts on services and utilities, including the need for services and utilities to be relocated or protected during the construction and/or operation of the project.

Measures to mitigate potential land use and property impacts are identified in this chapter. These measures have been informed by community, agency and stakeholder feedback.

## 16.2 Existing environment

### 16.2.1 Overview of local and regional land use

#### Local land use

The project is located within the local government areas of Coffs Harbour City, Clarence Valley, Richmond Valley and Ballina Shire. It would pass through or near to the following land uses:

- Coffs Harbour local government area: The project would be adjacent to the town of Corindi Beach and two tourist parks just south of Corindi Beach. It would pass through or near rural residential areas and properties, agricultural land, and Wedding Bells, Newfoundland and Glenugie State forests. It would also pass through part of the Wells Crossing Flora Reserve located next to the existing Pacific Highway
- Clarence Valley local government area: The project would be near the townships of Tyndale, Maclean, Townsend and pass through Harwood. It would pass through or near agricultural land, forestry land, and rural residential development. It would also pass through part of Yaegl Nature Reserve, and be 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 including prawn trawl, prawn pocket and general fisheries
- Richmond Valley and Ballina Shire local government areas: The project would be near the townships of Woodburn, Rileys Hill, Broadwater, Cabbage Tree Island and Empire Vale. It would pass through or near to agricultural land, and several rural residential areas and properties. It would also pass through Broadwater National Park and be 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.

#### Regional land use

The region's main land uses are:

- Agriculture: This is the main land use in the wider Northern Rivers and Mid North Coast regions, particularly cropping and grazing. Grazing mainly occurs in the area surrounding Grafton and west of Ballina. Cropping, which mainly involves sugarcane farming, generally occurs near the towns of Tyndale, Maclean, Harwood, Woodburn and Broadwater. The sugar mills at Harwood and Broadwater are also important rural industries in the region. Pockets of horticultural uses are located west of Corindi and Halfway Creek, and in the area surrounding Alstonville. Grafton continues to be an important processing centre for industry along the north coast, including timber
- Urban uses, comprising commercial, residential and industrial uses: These mainly occur in the major regional centres such as Coffs Harbour, Grafton, Lismore and Ballina. Residential, rural residential and commercial uses are also dispersed across the region within or close to towns such as Corindi Beach, Maclean, Townsend, Gulmarrad, Yamba, Woodburn, Trustums Hill, and Broadwater
- Future development potential linked to urban release areas includes land at Townsend, Gulmarrad and James Creek near Maclean
- State forest: State forests located near the project are managed for multiple uses including timber harvesting, recreation, bee keeping and conservation and occasionally leased for grazing. State forests include Wedding Bells, Newfoundland, Pine Brush, Tabbimoble, Mororo and Doubleduke State forests.





**Photo 1: View south of Blueberry Farm Exchange at Range Road, Corindi**



- Conservation: Large areas of the region are covered by national parks and nature reserves. These are generally located in the Coffs Harbour, Clarence Valley, and Richmond Valley local government areas. There are also conservation areas within Wedding Bells, Newfoundland and Doubleduke State forests.

These land uses are described in more detail in the following sections.

## 16.2.2 Agricultural land

### Regionally significant farmland

The Northern Rivers Farmland Protection Project (DoP, 2005) and Mid North Coast Farmland Mapping Project (DoP, 2008) identify areas of regionally significant farmland. The project traverses areas identified within the Northern Rivers Farmland Protection Project and Mid North Coast Farmland Mapping Project as regionally significant farmland.

#### **KEY TERM – 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 ongoing productivity and prosperity of a region” (DoP, 2008).**

The Northern Rivers Farmland Protection Project also identifies areas of state farmland. State farmland includes land that has a relatively unique combination of quality soils and landforms with a favourable climate. Regional farmland comprises land that is significant from a regional perspective but not necessarily unique.

According to the Northern Rivers Farmland Protection Project, there are no areas of state significant farmland located near the project (DoP, 2005). However, an area of state significant farmland is located west of the project boundary in Section 10, between Wardell Road and Bagotville Road. This would not be directly impacted by the project.

In addition, the Mid North Coast Farmland Mapping Project identifies regionally significant farmland to be protected from urban and rural residential development in the study area within Coffs Harbour and Clarence Valley local government areas (DoP, 2008). Areas of regionally significant farmland near the project are shown in Figure 16-1.

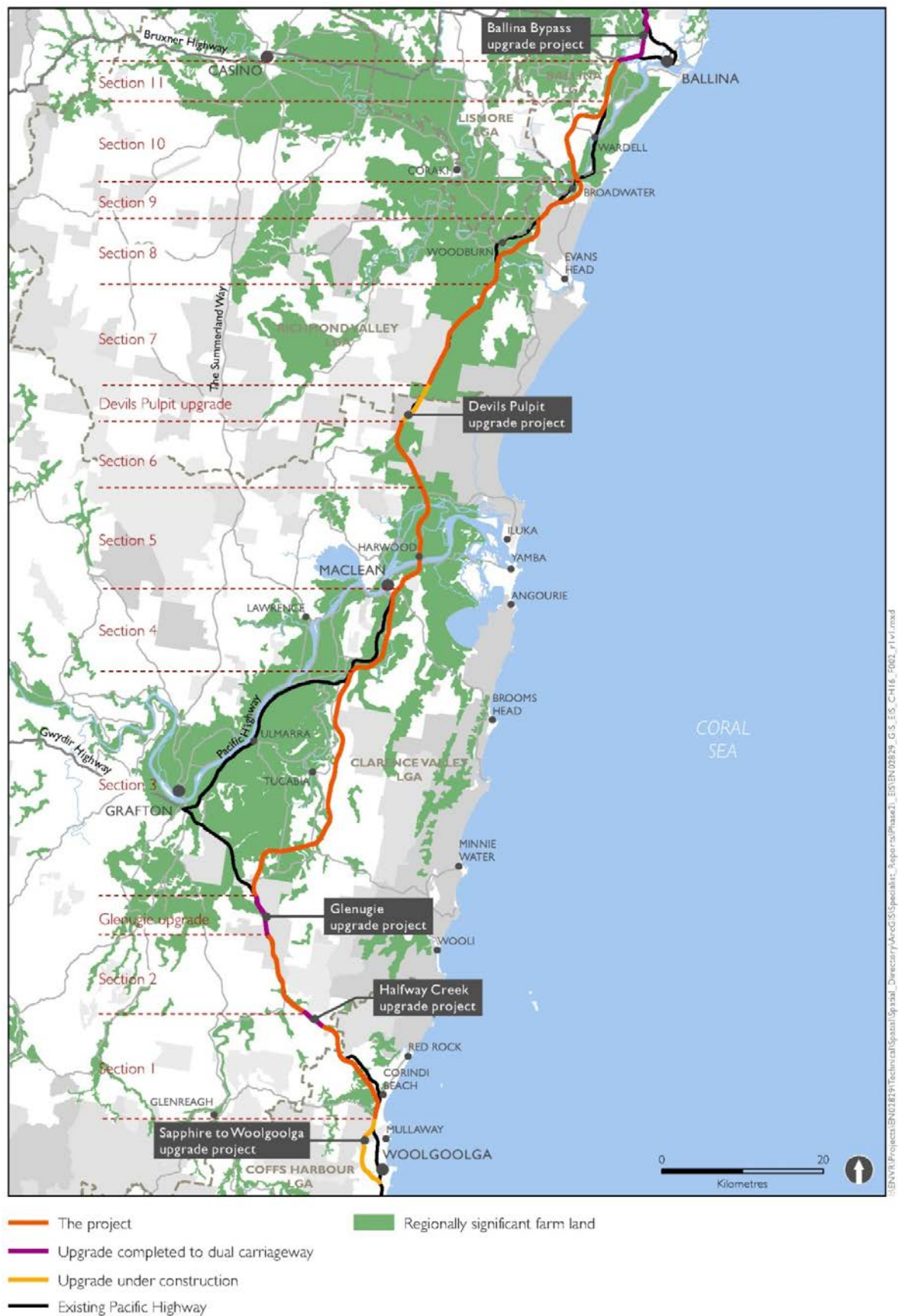


Figure 16-1: Regionally significant farmland within the study area



**Photo 2: Productive cane land near Shark Creek**

### **Cropping, grazing and horticultural land**

Agricultural land in the study area comprises cropping, grazing and horticultural uses.

Cropping land is mainly used for sugarcane. It is mainly located in the northern part of the Clarence Valley local government area and within the Richmond Valley local government area. Cropping land is mainly located near Tyndale. In this regard, the sugar industry is an important contributor to the economy of the area, providing employment opportunities, up and down stream supply chain benefits, and general trade. The NSW Sugar Milling Co-operative was formed when cane growers purchased three NSW sugar mills from their previous operator. The mills are located at Condong on the Tweed River, Broadwater on the Richmond River and Harwood on the Clarence River. The Co-operative also operates a sugar refinery which is located alongside the Harwood Mill.

Grazing land is mainly located around Grafton and in the northern part of the Coffs Harbour local government area. Grazing land is also scattered near the project in the Richmond Valley and Ballina local government areas.

Horticultural land is located west of Corindi and Halfway Creek, and around Alstonville. Horticultural uses mainly comprise a mix of tree fruits, banana plantations, vegetables, vine fruits, and nuts (eg macadamias). The Berry Exchange at Range Road, Corindi is located adjacent to Section 1 of the project. In particular, this is an important producer of raspberries and blueberries throughout NSW and Australia.

The location of cropping, grazing and horticultural land near the project is shown in Figure 16-2 to Figure 16-12.



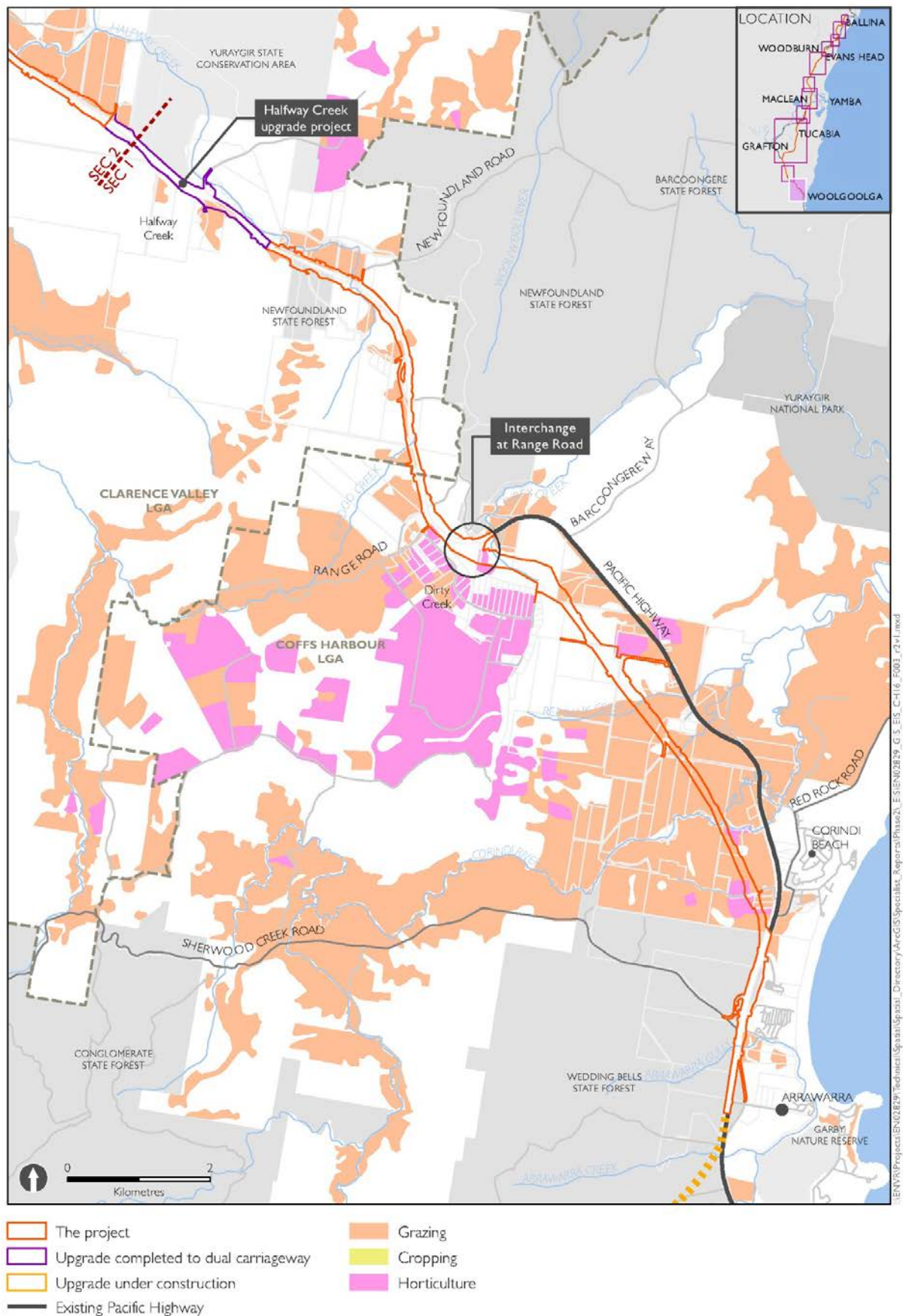
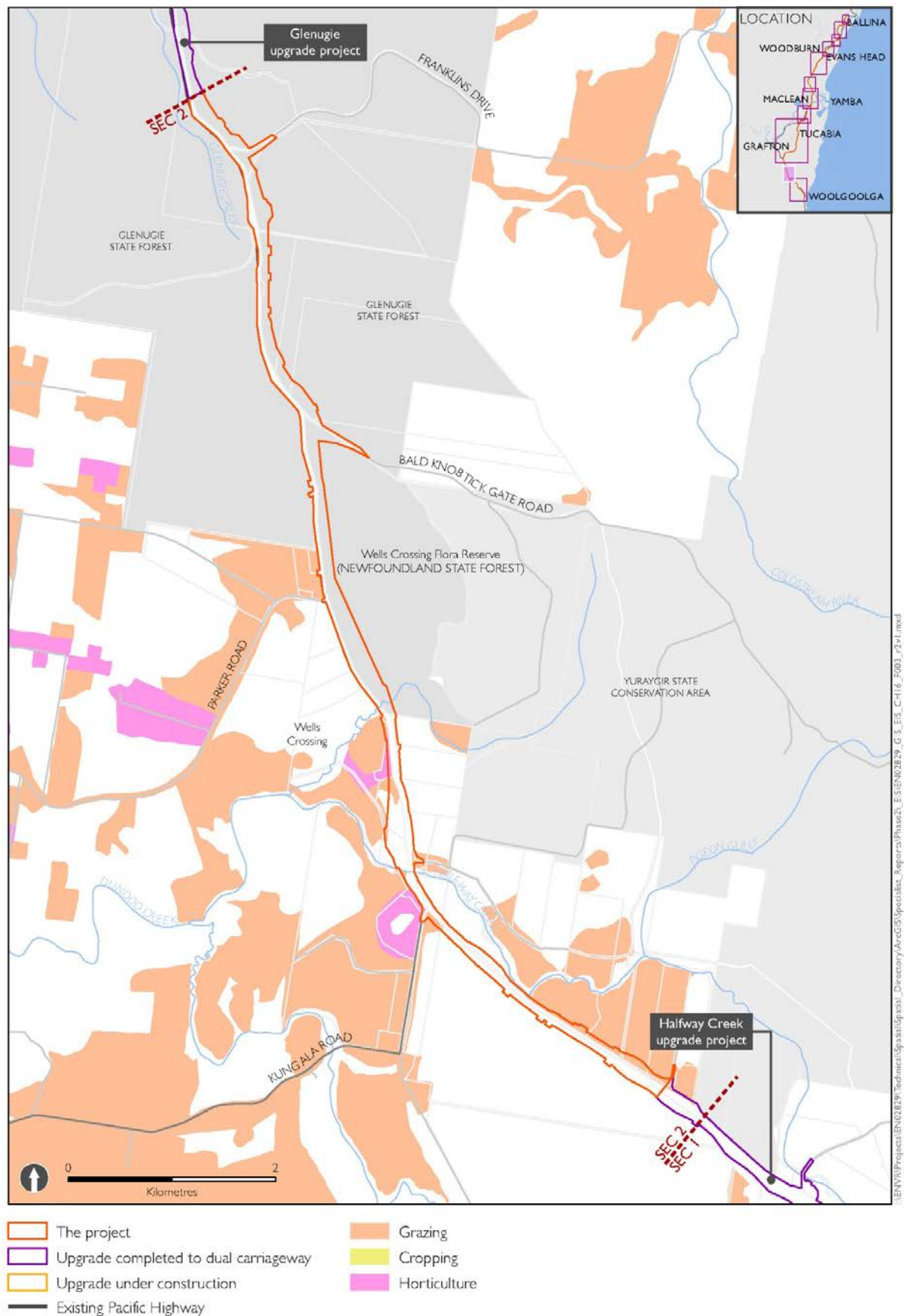
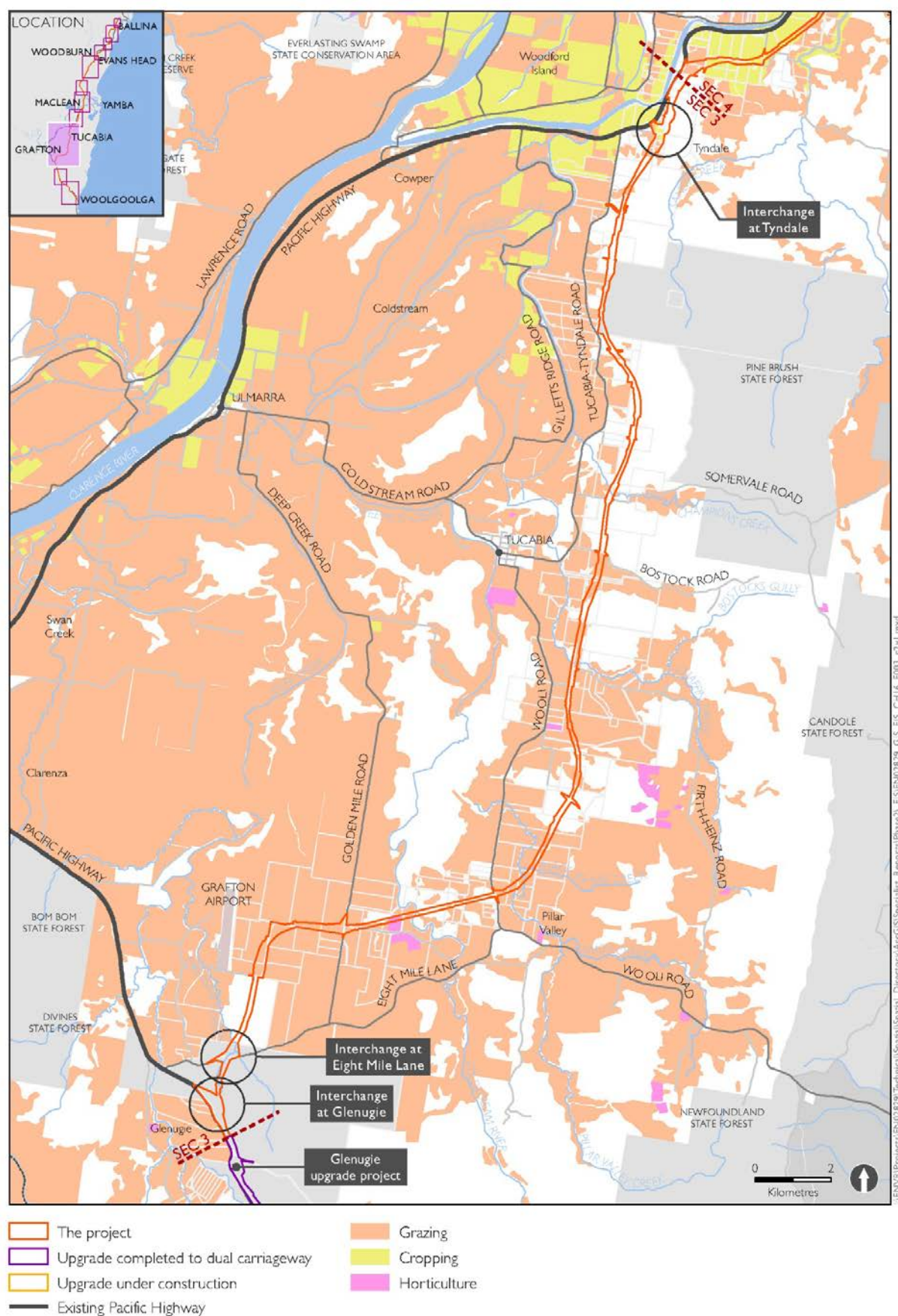


Figure 16-2: Agricultural land uses near the project: Section 1



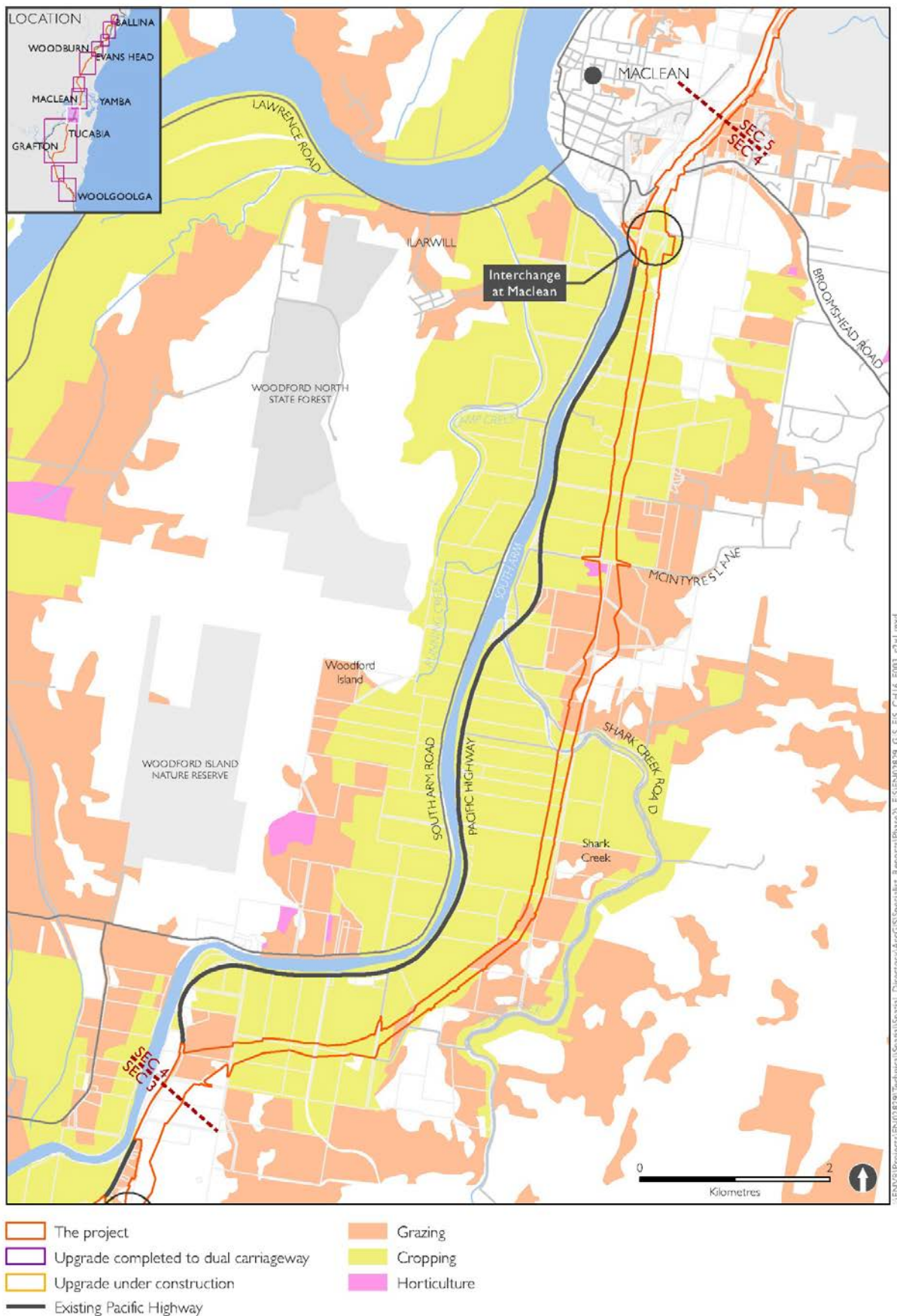
**Figure 16-3: Agricultural land uses near the project: Section 2**





**Figure 16-4: Agricultural land uses near the project: Section 3**





**Figure 16-5: Agricultural land uses near the project: Section 4**

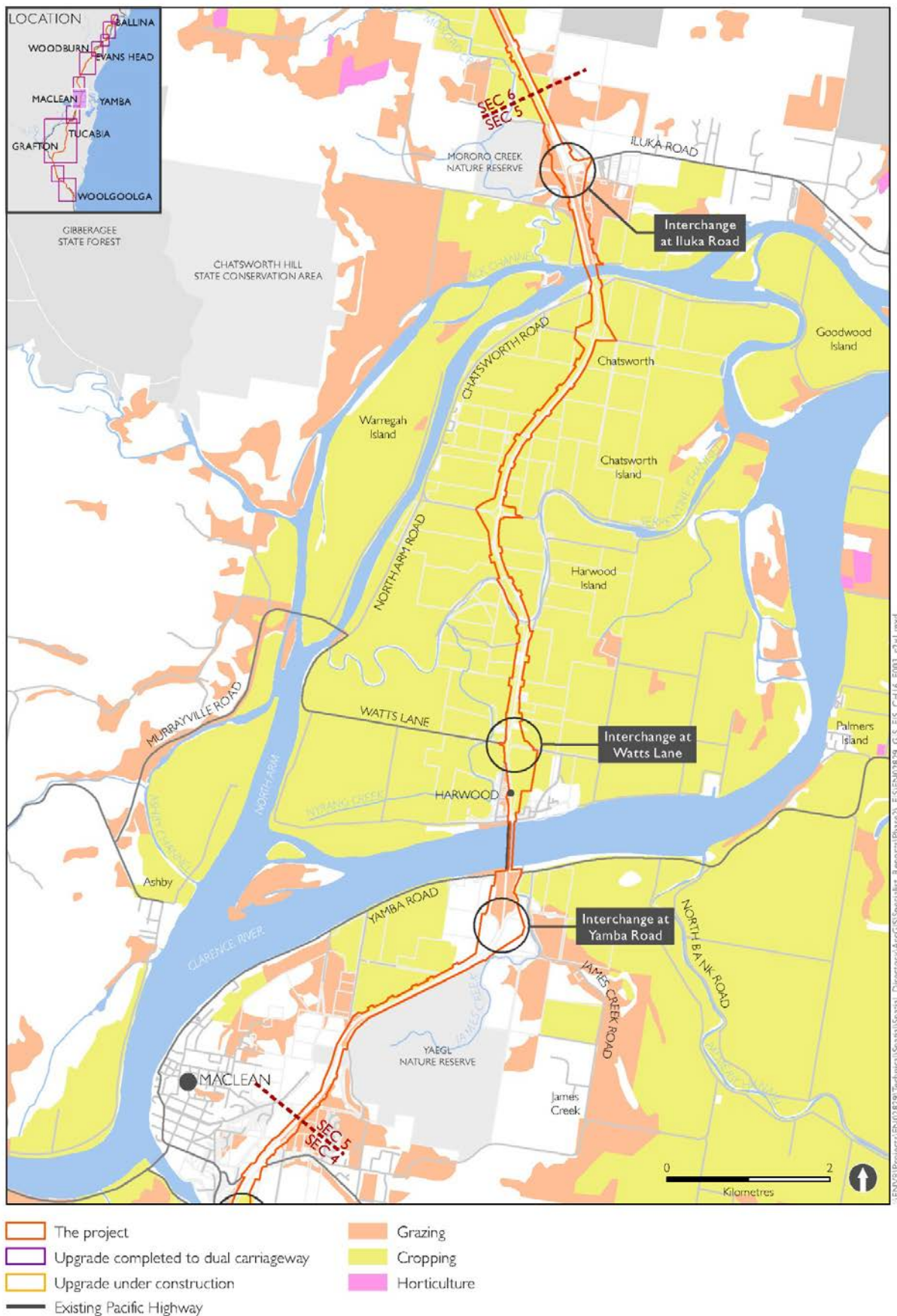
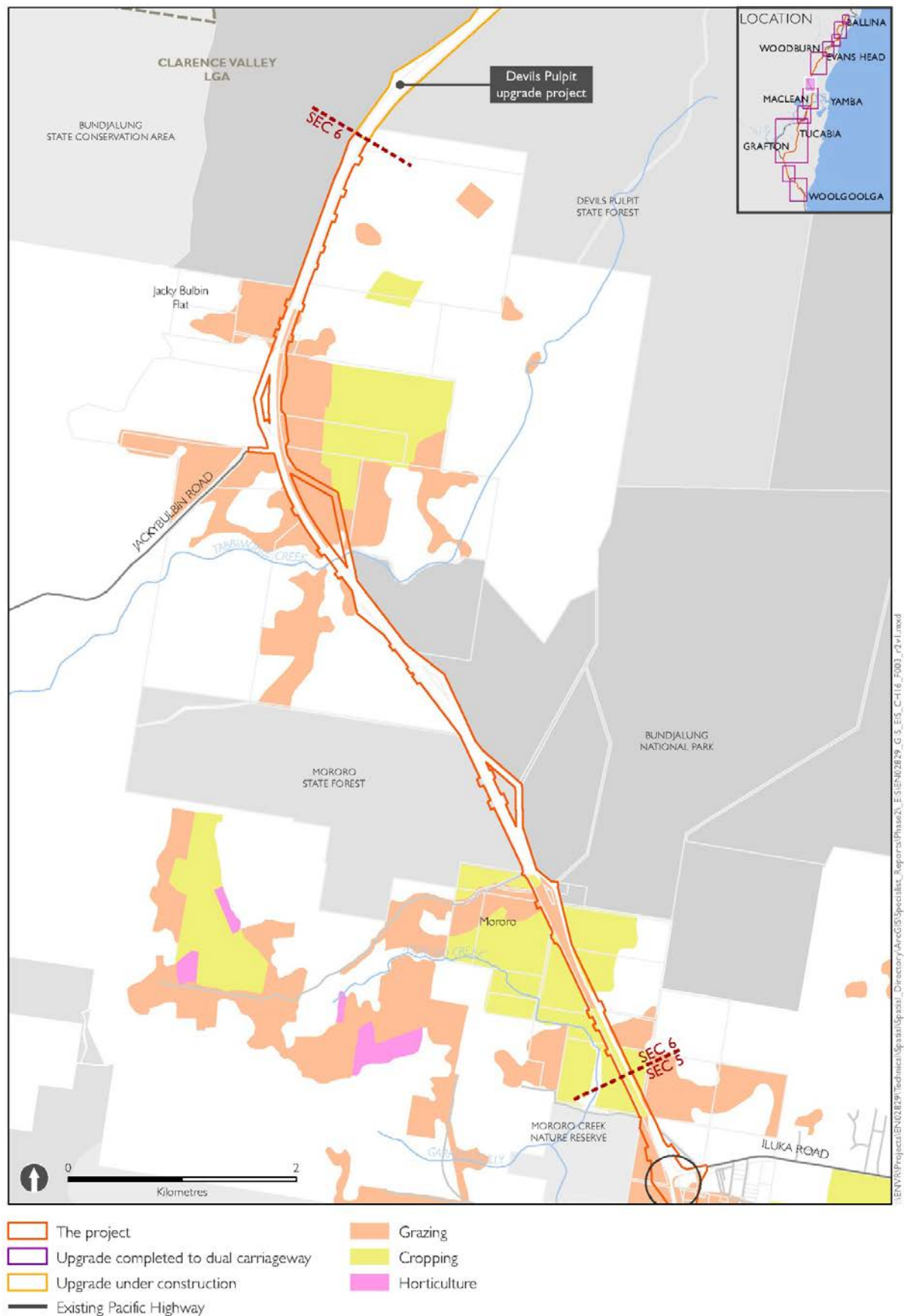


Figure 16-6: Agricultural land uses near the project: Section 5





**Figure 16-7: Agricultural land uses near the project: Section 6**



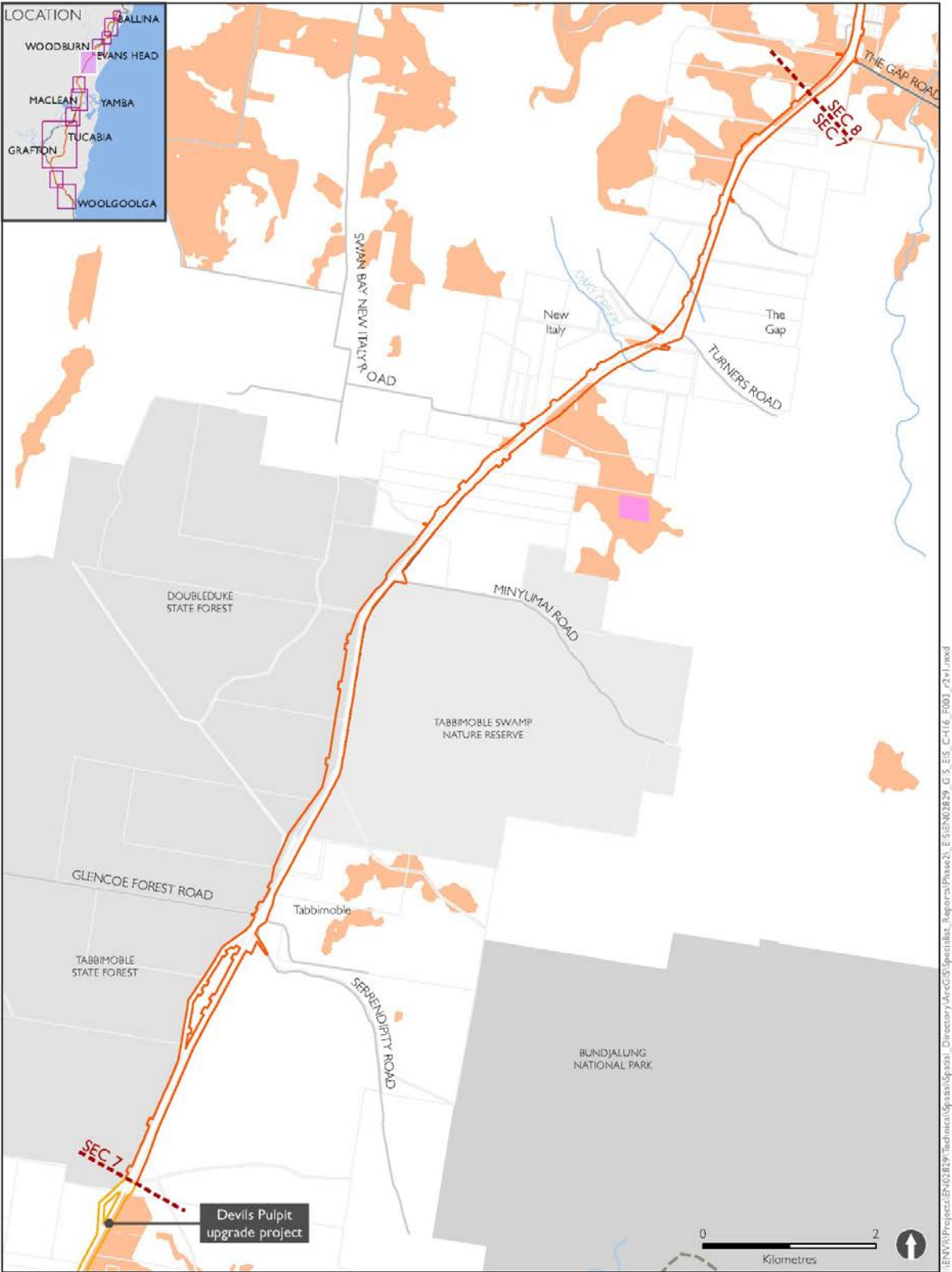
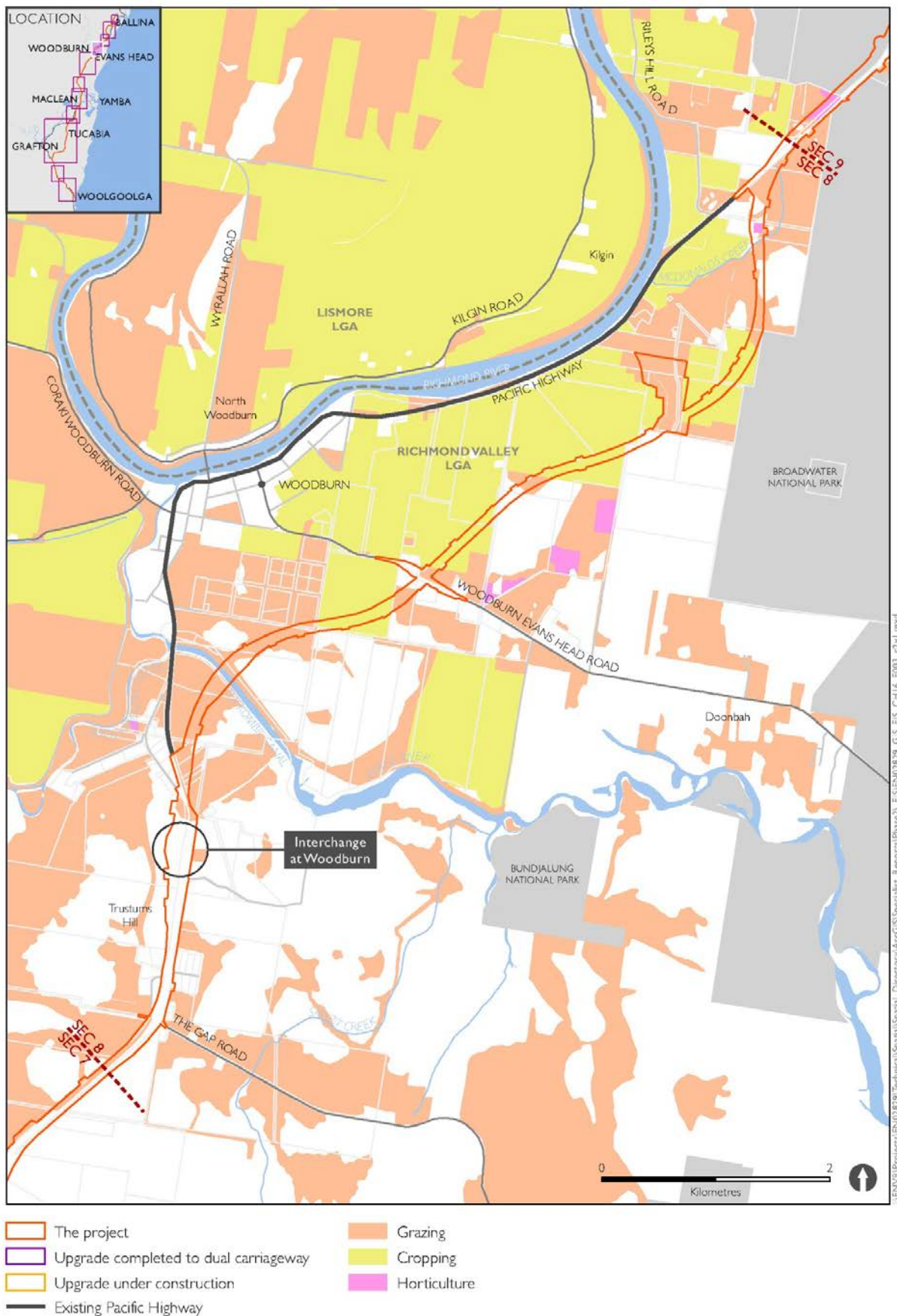


Figure 16-8: Agricultural land uses near the project: Section 7



**Figure 16-9: Agricultural land uses near the project: Section 8**

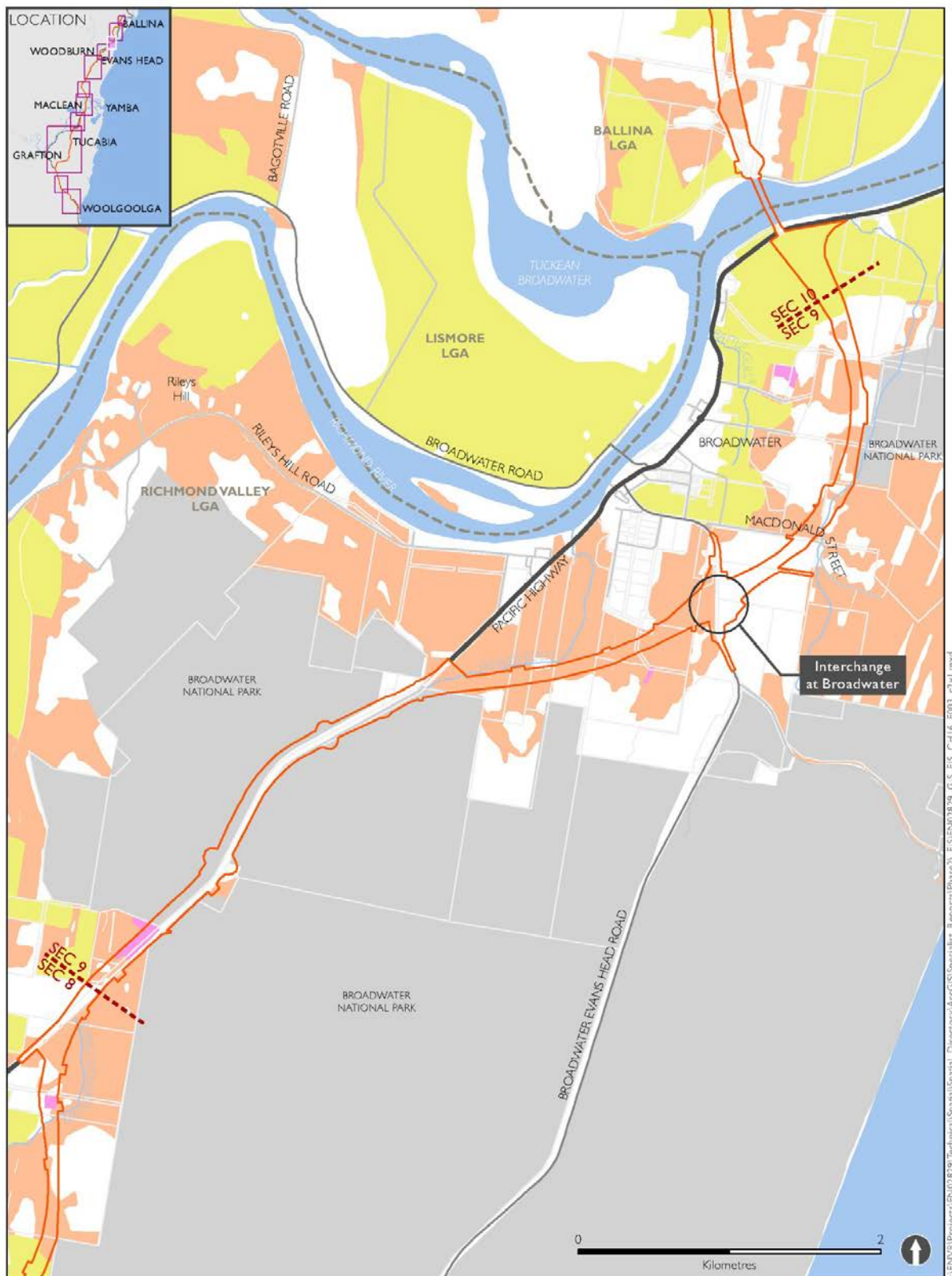
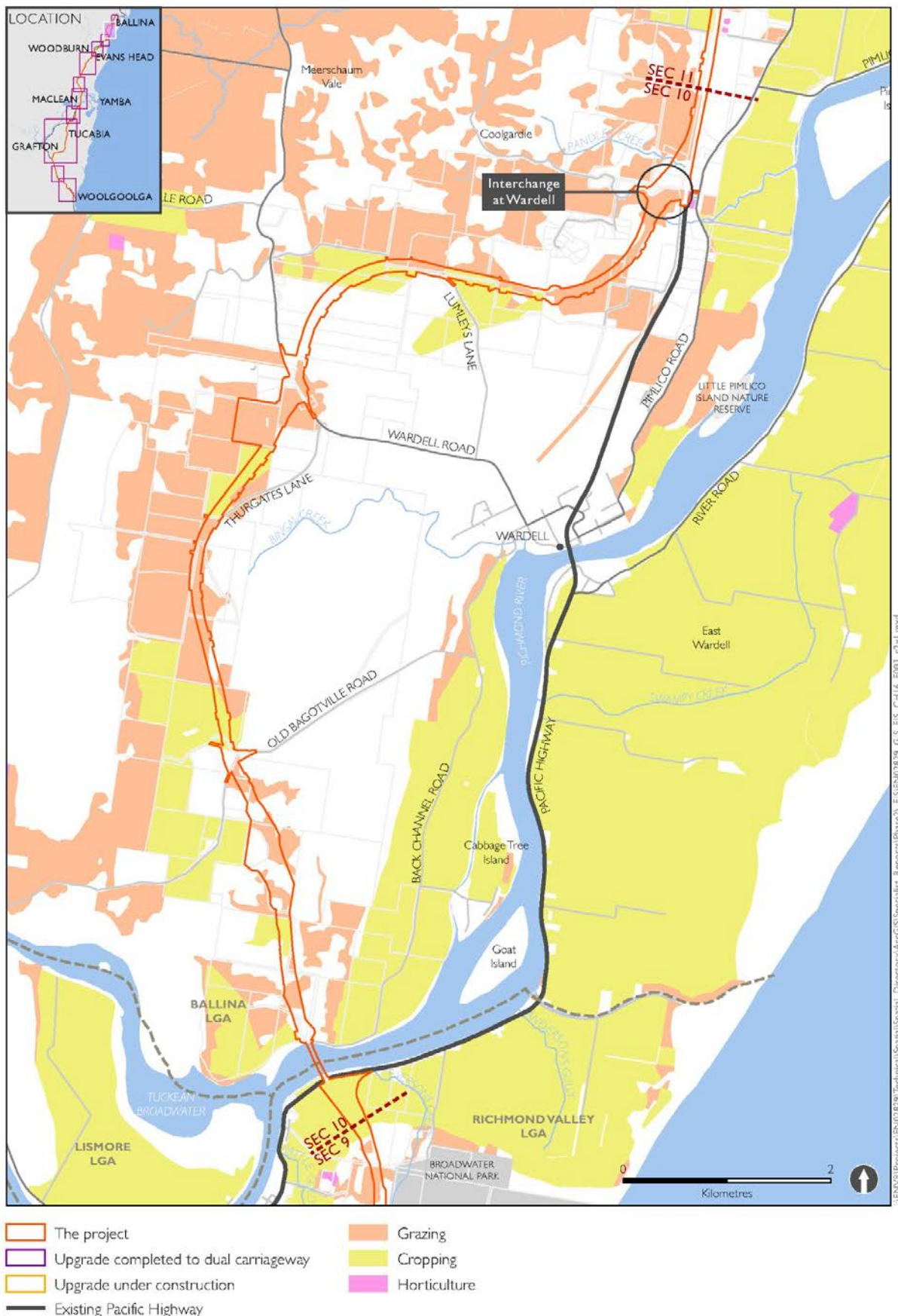


Figure 16-10: Agricultural land uses near the project: Section 9





**Figure 16-11: Agricultural land uses near the project: Section 10**

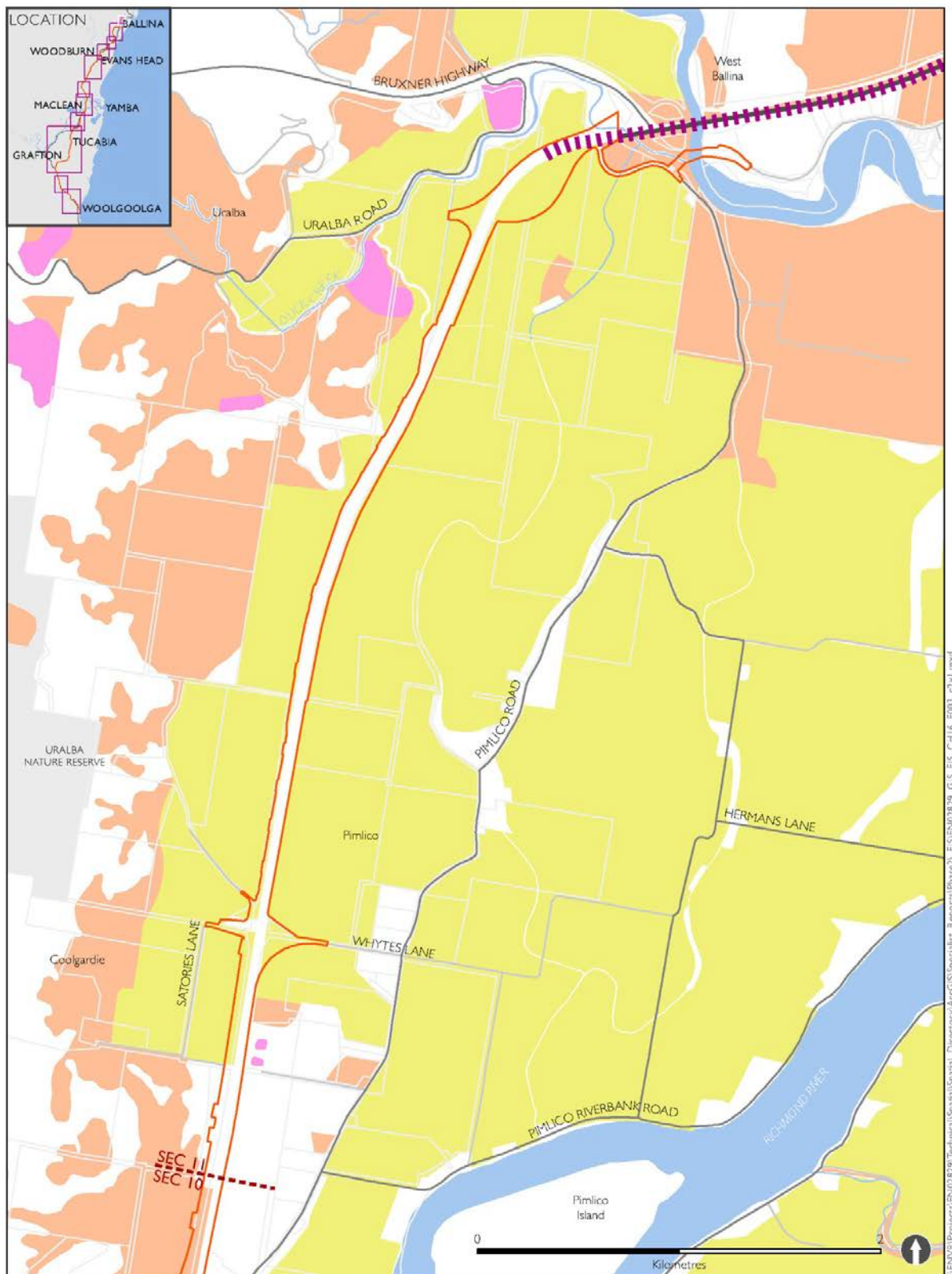


Figure 16-12: Agricultural land uses near the project: Section 11

## **Agricultural infrastructure and travelling stock routes**

There is a range of infrastructure supporting agricultural land uses within the study area, including irrigation, sugarcane drains, and farm dams, sheds, fencing and cane pads. Most of this infrastructure is on private farmland. In particular, several cane pads and drains are located in close proximity to the project in Section 4 of the project between Tyndale and Maclean. Cane pads can include areas of hard standing and comprise agricultural infrastructure of importance to the sugar cane industry.

The project would also pass under an existing conveyor used by the sugar mill at Broadwater, which is owned by the NSW Sugar Milling Co-operative Ltd.

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.

## **Agricultural diseases and quarantined properties**

There are no quarantined properties near 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.

### **16.2.3 Commercial fishing and aquaculture**

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 around \$2 million. About 110 fishing businesses are authorised to operate in the Clarence River estuary prawn trawl, 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 small catches of king prawns and finfish. School prawns make up around 95 per cent of the total catch. Rainfall has a major effect on catches of prawns in the Clarence River. 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 largest catches are taken between October and March. School prawns are taken using prawn set pocket nets. 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 (mainly comprising small fishing boats). Up to 87 species are caught across this fishery, the main species targeted including sea mullet, luderick, and bream. The most used estuarine fishing methods are meshing and hauling nets. The Clarence River produces the highest commercial eel catch, with the use of eel traps peaking during winter (NSW Fisheries, 2001; DPI, 2006).





**Photo 3: Harwood bridge crossing over the Clarence River**

Other important fisheries in the study area include:

- Trap and line fishery
- Ocean hauling fishery.

The NSW Oyster Industry Sustainable Aquaculture Strategy (DPI, 2006) identifies the locations of priority oyster areas within the wider region. There are no oyster priority areas located near to the project. However, priority oyster aquaculture areas are located near the mouth of the Clarence and Richmond rivers.

#### **16.2.4 Conservation areas**

A large part of the study area comprises conservation land including national parks and reserves, conservation areas, wetlands, and tree and shrub cover. Conservation areas near the project 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 (Section 1 and 2)
- Wells Crossing Flora Reserve located in the Newfoundland State Forest and is located north of Halfway Creek (Section 2).
- Yaegl Nature Reserve, located near Maclean (Section 5)
- Mororo Creek Nature Reserve, located 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 (Section 6)
- Bundjalung State Conservation Area, located north of the proposed interchange at Iluka Road (Section 6)
- Tabbimoble Swamp Nature Reserve, located north of Tabbimoble (Section 7)

- Broadwater National Park, which 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 9)
- Uralba Nature Reserve, located north of the proposed interchange at Wardell (Section 11).

The locations of national parks, conservation areas and State forests near the project are shown in Figure 16-13.



**Photo 4: View to Broadwater, Broadwater National Park in foreground**



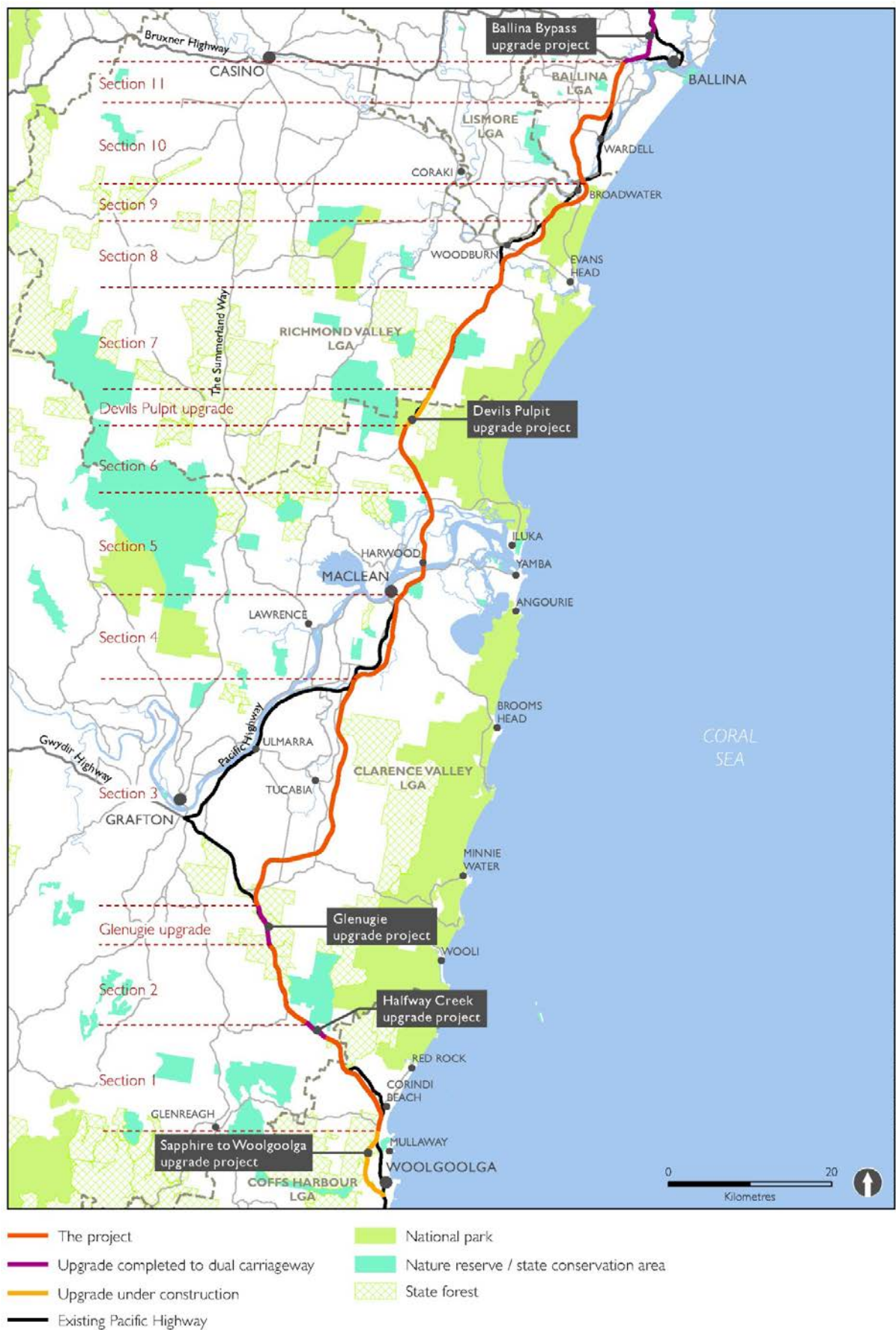


Figure 16-13: National parks, conservation areas and State forests in the study area



Land reserved under the *National Parks and Wildlife Act 1974* would need to be subject to a revocation before that land could form part of the future road reserve. This is required for parcels of land within Yaegl Nature Reserve and Broadwater National Park.

The project is also located near or within areas identified as wetlands or tree and shrub cover. Many of the areas identified as tree and shrub cover adjoin national parks, nature reserves and State forests.

### 16.2.5 Natural resources

The NSW North Coast supports a wide range of primary industries, including agriculture, forestry, mining, and commercial and recreational fishing.

State forests located near the project are managed for multiple uses including timber harvesting, recreation, bee keeping and conservation and occasionally leased for grazing. State forests near the project are shown in Figure 16-13. They include:

- Wedding Bells State Forest, west of Arrawarra (Section 1)
- Newfoundland State Forest, located near Milleara (Section 1) and north of Halfway Creek (Section 2)
- Glenugie State Forest, located mainly between Halfway Creek and the proposed interchange at Eight Mile Lane (Section 2 and part Section 3)
- Pine Brush State Forest, located south of the proposed Tyndale interchange (Section 3)
- Mororo State Forest, at Mororo (Section 6)
- Tabbimoble State Forest and Doubleduke State Forest, located at Tabbimoble (Section 7).

The project would also traverse six mining and petroleum leases and licences. The petroleum licences relate to coal seam gas exploration. There are also applications over parts of the study area for mining and petroleum exploration.

A number of quarry operations are located across the wider region. These provide a range of materials including sandstone, ironstone and ridge gravel, chert, sand, basalt, and argillite. The locations of quarries across the wider region are shown in Figure 16-14. Requirements for construction materials from quarries are discussed in Chapter 6 (Description of the project - construction). In terms of access, the impact of the project on the local and state forest road network are described in Chapter 14 (Traffic and transport).

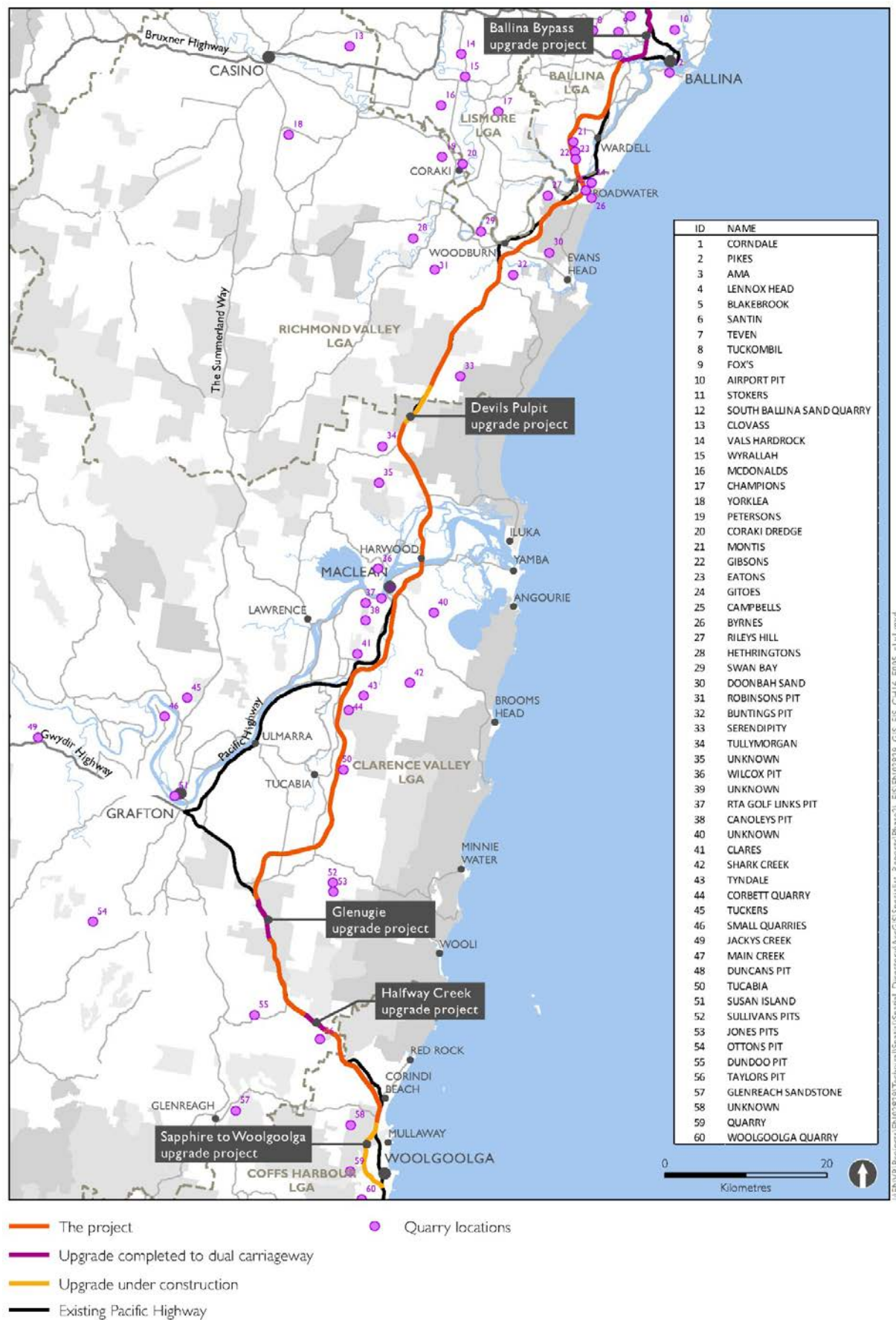


Figure 16-14: Location of quarries in the study area

### 16.2.6 Infrastructure and utilities

Major infrastructure and utilities in the study area include:

- Road corridors, such as the existing Pacific Highway and local road network
- Electricity transmission networks (low and high voltage)
- Telecommunications networks, including copper and optic fibre cables linking Brisbane and Sydney
- Sewer and water supplies managed by the Coffs Harbour, Clarence Valley, Richmond Valley and Ballina local government areas.
- Rous Water County Council also manages water supply infrastructure within the study area. The Rous Water borefield is located east of Woodburn within Section 8 of the project (around station 132.0). The bore field can be used to supply drinking water.

A sewerage pump station is proposed on land adjacent to Broadwater-Evans Head Road in Section 9 of the project. The Broadwater Sewerage Scheme would comprise a rising main that would exit the pump station and travel along the Broadwater-Evans Head road toward Evans Head.

### 16.2.7 Land tenure

The majority of land within the study area is held in freehold title. This includes properties held in freehold by Roads and Maritime Services (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*.

The study area also 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.

The study area also contains three properties owned by Aboriginal Land Councils. The existing land use of these properties comprises tree, shrub cover and grazing.

## 16.3 Assessment of impacts

In terms of impacts, in some sections, the project would duplicate the existing Pacific Highway (about 43 per cent of its length, around 68 kilometres); in others it would deviate from it (about 57 per cent of its length, around 87 kilometres).

### 16.3.1 Direct impacts on properties

Around 564 individual lots would be directly impacted by the project, either in total or in part. This would affect around 381 landowners. About 64 per cent of land acquisitions have commenced (as of September 2012). In many cases, a number of lots are owned by the one property owner. The majority are rural landholdings. Residential, commercial and community properties would also be directly affected.

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

- There would be 311 properties 'partially affected' (55 per cent of affected properties). That is, part of the property would be required for the project. However, the project is not expected to have a significant effect on the functionality or viability of the current or future use of the property
- There would be 142 properties 'materially affected' (25 per cent of affected properties) – that is, part of the property would be 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 reasons:
  - More than 40 per cent of the total property area may be impacted
  - There may be a requirement to demolish a residential dwelling or major structure



- There may be property severance, with properties cut in two by the project and no access available between the two portions of land
- There may be a need for a significant change to access to the property, or access may be unavailable
- There would be 111 properties ‘totally affected’ (20 per cent of affected properties) – that is, the whole property would be required for the project. These properties are located within the area required by the project.

Appendix B of the Working Paper – Land use and property (SKM, 2012a) includes a detailed impact assessment of each property likely to be affected, and its current land use.

As mentioned above, there are five key issues that would have long-term impacts on directly affected properties:

- Changes to property access
- Property infrastructure
- Impacts on future use and development
- Property acquisition
- Property severance, fragmentation and sterilisation.

### 16.3.2 Changes to property access

Under arterial standard, direct property access would be maintained to the Pacific Highway. Typically, this would be via a left-in, left-out arrangement, however in some instances, access would be located at U turn bays which would enable a right in traffic movement.

Under the motorway standard the project would remove direct property access to the Pacific Highway. Highway intersections would also be removed, with access to the upgraded highway being via a proposed service road or the local road network to the nearest interchange.

In those areas where the project involves realigning the highway, property access to the existing highway would be maintained. In areas where the project involves widening the highway, property access would be provided to new service roads adjacent to the highway.

Of those properties affected by land acquisition, around 90 would have access related impacts. This equates to around 16 per cent of affected properties.

### 16.3.3 Land use and construction

Temporary impacts would occur during project construction, including on land temporarily leased for the project outside of the operational footprint. These impacts would be caused by the following construction activities:

- Establishing ancillary facilities that would accommodate batch plants, stockpile areas, construction worksites, site offices and other temporary infrastructure required for construction
- Constructing temporary sedimentation basins to capture sediment from water runoff
- Modifying the use of existing roads and access arrangements.
- The impacts of these construction activities would include:
  - Temporary changes to land use and impacts 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 at 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

- Temporary changes to traffic conditions, access to local roads, and the existing Pacific Highway near the construction areas. These changes may impact on nearby land uses through increased travel times, changes to property access, and impacts on local amenity.

Around 233 hectares of ancillary site land potentially required for construction is outside the project boundary. Of this, around 200 hectares is estimated to be agricultural land, used for grazing, cropping or horticulture.

Following construction, land used for construction and not required for the operation of the highway would be rehabilitated and managed in accordance with the project's remnant land and property strategy.

Negotiations with owners of other directly affected properties are continuing as part of the property acquisition program.

### **16.3.4 Property infrastructure**

The project would directly impact a number of buildings or structures that are located on properties that need to be acquired for the project. These include about 60 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.

Around four cane pads including hard standing used for sugar cane storage are also affected, particularly in Section 4 of the project between Tyndale and Maclean. These would require relocation to nearby land in consultation with affected landowners.

Around 15 farm dams would be directly affected by the project. Up to 10 farm dams could also be indirectly affected by the project from potential changes in drainage. Drainage to and from these farm dams and / or their reconstruction would be subject to detailed design and consultation with affected landowners. Further information is provided in Chapter 9 (Soils, sediments and water), and Working paper – Hydrology and flooding.

Appropriate fencing would also require reinstatement along adjusted boundaries for affected properties.

Of those properties affected by land acquisition, around 86 would have impacts related to buildings or infrastructure. This equates to around 15 per cent of affected properties.

### **16.3.5 Future land use and development potential**

The acquisition of land for the project would result in the reconfiguration of some partially impacted properties. In these cases, there may be potential impacts on future property development due to a reduction in the property size and amount of developable area on each property (local council development controls specify minimum lot sizes for future development).

Overall, the project would support future development across the region by improving access to major regional centres such as Coffs Harbour and Ballina and areas outside the region such as south-east Queensland. It would also support the development of future growth areas, including near Maclean at Townsend, Gulmarrad and James Creek, by improving access and connectivity to major regional centres.

The project would not directly impact urban release areas identified for future residential or employment land.

Land zoned for Rural (Investigation) is located near the project in Section 5, Section 8 and Section 9. These areas are not very developed and may be suitable for future urban development.

### 16.3.6 Property acquisition process

#### Property ownership

The project would directly impact both private and publically owned land including:

- Three hundred and sixty eight properties that are privately owned
- One hundred and forty two properties owned by RMS (some previously acquired for the project)
- Forty three properties owned by the NSW government, including Crown Land (reserves, roads, waterways, State forests and national parks) and other government agencies
- Eleven properties owned by local governments including Coffs Harbour City Council, Clarence Valley Council, Richmond Valley Council and Ballina Shire Council.

Three properties directly impacted by the project are owned by Aboriginal Land Councils. These properties largely comprise tree and shrub cover.

Roads and Maritime Services are already consulting with relevant property owners about the acquisition process. Many properties affected by the project are 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.

Property acquisition would affect around 381 landowners. About 64 per cent of land acquisitions have commenced (as of September 2012).

In terms of further design refinements, the tie in to the existing highway and land requirements for the property at station 145.0 would be reviewed

### 16.3.7 Property severance, fragmentation and sterilisation

The project would create severance and fragment some larger properties into smaller parcels of land. Of those properties affected by land acquisition, around 96 would have severance related impacts. This equates to around 17 per cent of properties affected. Around 638 hectares of affected land would be severed, with impacts most apparent in sections 3, 4, 8 and 10 of the project. Areas of impacts are particularly associated with deviated sections of the highway.

#### **KEY TERM – Land use severance, and land use sterilisation**

**Land use severance in the context of this assessment refers to the creation of a physical barrier between a property and an existing road access to that property, or between one part of a property and another part of the same property.**

**Land use sterilisation refers to the situation where properties and their land use are severed into fragments of a size and / or shape that makes on-going use of that land unfeasible.**

In many instances, both portions of the property would have direct access to local roads or motorway standard service roads. However, in some instances, the severed portion of the property would not be accessible via local roads or from the main portion of the affected property.

This is a key issue for landholders, who have raised specific concerns about restrictions on the movement of farm equipment and livestock between different areas of the property, including during floods.

The design of the project has sought to minimise the severance and fragmentation of properties by closely following property boundaries. Where this is not feasible, alternative access would be provided between separated portions of land, where possible.

Land use sterilisation would be avoided for most directly impacted properties. However, there are some properties where the size of the remaining portion of land makes the continued use or future development unfeasible.



During consultation, some property owners raised the issue of maintaining safe access for properties adjacent to the upgraded highway. While removing or severing a property's direct access to the highway may result in longer travel distances from some properties, this would improve safety and ease of access for local residents through reduced traffic volumes. 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.

In terms of property impacts, traffic, transport and access issues are discussed in Chapter 14 (Traffic and transport). Social and economic issues are discussed in Chapter 17 (Social and economic).

The impacts of the project on land sterilisation and property severance are summarised in Table 16-1. For further information regarding property impacts, refer to Working paper – Land use and property. Property impacts have been classed as total, material or partial, as follows:

- Totally affected - the whole of the property is required for the project
- Materially affected - part of the property is 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
- Partially affected - part of the property is required for the project. The project would have no significant effect on the functionality or viability of the current or future use of the property.



**Photo 5: Cane land located to adjacent to the existing Pacific Highway**

**Table 16-1: Property impacts and severance**

Project section	Property lot and DP	Total property area (ha)	Area of impact (ha)	Percentage of property affected	Current land use for majority of the affected property area	Description of impacts	Potential management options
1	Lot4 DP815051	17.0	3.7	21%	Grazing	Partially affected. A portion of the site on the south west is severed from the main.	Affected land to be acquired. New access road proposed adjacent to severed portion provides an opportunity for access.
1	Lot1 DP379009	5.3	2.7	51%	Grazing	Materially affected due to percentage of property affected. Also a portion of the site to the south is severed from the main lot.	Affected land to be acquired. New access road proposed adjacent to severed portion provides an opportunity for access.
1	Lot3 DP629984	42.3	7.3	17%	Tree & Shrub Cover	Partially affected. A portion of the site is also severed.	Affected land to be acquired. New access road proposed adjacent to severed portion provides an opportunity for access.
1	Lot51 DP851056	12.0	4.1	34%	Grazing	Materially affected including a dwelling and farm buildings. The property is also severed.	Total acquisition.
1	Lot24 DP705683	76.3	19.0	25%	Tree & Shrub Cover	Partially affected including some severing.	Affected land to be acquired. A proposed access road provides access opportunities for the severed land to the south.
1	Lot12 DP632158	41.9	8.3	20%	Grazing	Partially affected including some severing.	Affected land to be acquired. Access is available to both sides of the property under a bridge proposed on this property.

Project section	Property lot and DP	Total property area (ha)	Area of impact (ha)	Percentage of property affected	Current land use for majority of the affected property area	Description of impacts	Potential management options
1	Lot11 DP1110135	59.5	12.2	21%	Grazing	Materially affected due to severing.	This property is part of a larger holding. The design includes allowance for a public access way under the new highway linking both sides of property under the same ownership. Affected land to be acquired.
1	Lot54 DP752820	19.6	1.8	9%	Grazing	Partially affected including minor severing.	Affected land to be acquired. An adjacent parcel under the same ownership has a bridge on it allowing access underneath the new highway linking the severed portions of the larger holding.
1	Lot130 DP751389	40.7	6.3	15%	Tree & Shrub Cover	Materially affected. Road severs property and isolates eastern portion.	NSW Government owned
1	Lot7001 DP92573	217.1	11.1	5%	Tree & Shrub Cover	Materially affected due to severing.	NSW Government owned.
3	CAD ID104672361	1391.0	53.3	4%	Conservation Area	Partially affected including some severing.	NSW Government owned. Both portions retain road frontage.
3	Lot1 DP393766	34.3	3.5	10%	Grazing	Materially affected due to severing.	The severed portions are able to be accessed under the proposed highway. Affected land to be acquired.
3	Lot1 DP606007	20.9	4.9	23%	Grazing	Materially affected due to severing.	Discussions to be held with landowner regarding the viability of this lot and whether a partial or total acquisition is required.



Project section	Property lot and DP	Total property area (ha)	Area of impact (ha)	Percentage of property affected	Current land use for majority of the affected property area	Description of impacts	Potential management options
3	Lot1 DP622795	89.1	5.9	7%	Tree & Shrub Cover	Materially affected due to severing.	Despite severing, access to both halves of the property is available off Wooli Road. Affected land to be acquired.
3	Lot10 DP822853	50.2	6.5	13%	Tree & Shrub Cover	Partially affected including some severing in the north east.	Affected land and severed area to the north east to be acquired.
3	Lot115 DP751365	46.9	14.4	31%	Grazing	Materially affected due to serving. Access to an adjacent parcel (Lot 116 DP751365) may also be affected.	Acquisition of the affected land. Plus discussions about the implications of the severing on the usability of the parcels. A total acquisition may be necessary.
3	Lot120 DP751365	20.2	3.7	18%	Tree & Shrub Cover	Materially affected due to severing.	Affected land to be acquired. Underpass and road to be constructed under highway to ameliorate severing.
3	Lot121 DP751378	54.6	2.0	4%	Tree & Shrub Cover	Materially affected due to severing.	Affected land to be acquired.
3	Lot124 DP751365	40.9	8.1	20%	Tree & Shrub Cover	Materially affected due to severing.	The proposed road design includes an underpass to link both sides of the property. Affected land to be acquired.
3	Lot127 DP751378	56.5	9.6	17%	Tree & Shrub Cover	Materially affected due to severing.	Adjacent road will be realigned to pass under the highway and will provide road access to both sides of the severed parcel. Affected land to be acquired.
3	Lot142 DP751365	124.7	9.1	7%	Tree & Shrub Cover	Materially affected due to severing.	Affected land to be acquired. Adjacent road will pass over the highway and will provide road access to both sides of the severed parcel.

Project section	Property lot and DP	Total property area (ha)	Area of impact (ha)	Percentage of property affected	Current land use for majority of the affected property area	Description of impacts	Potential management options
3	Lot169 DP751365	8.2	0.9	11%	Grazing	Materially affected due to severing.	Affected land to be acquired. Bridge across the proposed highway allows access underneath linking both sides of the property.
3	Lot170 DP751365	8.6	0.9	10%	Grazing	Materially affected due to severing.	Affected land to be acquired. Bridge across the proposed highway, on an adjacent lot under the same ownership, allows access underneath linking both sides of the property.
3	Lot183 DP751365	492.7	26.2	5%	Tree & Shrub Cover	Partially affected including some severing	Affected land to be acquired.
3	Lot2 DP622795	89.2	5.3	6%	Grazing	Partially affected including some severing.	Affected land to be acquired. An underpass has been allowed for in the design to link both sides of the property.
3	Lot2 DP658571	29.5	3.3	11%	Tree & Shrub Cover	Partially affected including some severing.	RMS owned. The two sides of the property are accessible from Wooli Road which would pass underneath the new road.
3	Lot27 DP751378	40.5	7.8	19%	Grazing	Partially affected including some severing.	Affected land to be acquired. An underpass has been allowed for in the design to link both sides of this property.
3	Lot3 DP16409	28.3	2.7	10%	Tree & Shrub Cover	Partially affected including some severing	RMS owned.
3	Lot51 DP751378	106.9	3.5	3%	Tree & Shrub Cover	Partially affected including some severing.	Affected land to be acquired. An underpass has been allowed for in the design to link both sides via another lot under the same ownership.

Project section	Property lot and DP	Total property area (ha)	Area of impact (ha)	Percentage of property affected	Current land use for majority of the affected property area	Description of impacts	Potential management options
3	Lot54 DP703282	41.6	1.5	4%	Grazing	Partially affected. A portion of the north western portion of the lot is severed.	RMS owned.
3	Lot584 DP626719	278.4	10.9	4%	Grazing	Partially affected including some severing.	Affected land to be acquired. An underpass has been allowed for in the design to link both sides via another lot under the same ownership.
3	Lot68 DP751376	49.0	12.5	26%	Grazing	Partially affected including some severing.	Affected land to be acquired with compensation paid. An underpass has been allowed for in the design to link both sides via another lot under the same ownership.
3	Lot7 DP793765	40.3	14.3	35%	Grazing	Partially affected including some severing.	RMS owned.
3	Lot72 DP751376	83.3	9.8	12%	Tree & Shrub Cover	Partially affected including some severing.	RMS owned.
3	Lot84 DP751376	16.2	2.8	17%	Tree & Shrub Cover	Materially affected due to severing	RMS owned.
3	Lot9 DP822853	32.6	3.3	10%	Tree & Shrub Cover	Materially affected due to severing.	Affected land to be acquired. Severing is addressed by an underpass planned to be constructed on the lot to the south that is under the same ownership.
3	Lot90 DP751376	16.2	2.3	14%	Tree & Shrub Cover	Materially affected due to severing.	RMS owned.
3	Lot10 DP1123632	394.1	25.5	6%	Tree & Shrub Cover	Partially affected including some severing.	Affected land to be acquired. An underpass to the south links both sides of the property.



Project section	Property lot and DP	Total property area (ha)	Area of impact (ha)	Percentage of property affected	Current land use for majority of the affected property area	Description of impacts	Potential management options
3	Lot92 DP751378	29.8	4.7	16%	Grazing	Partially affected including some severing.	Affected land to be acquired. An underpass has been allowed for in the design to link both sides of the property.
3	Lot15 DP751378	16.2	6.2	38%	Grazing	Partially affected including some severing.	Affected land to be acquired. An underpass has been allowed for in the design to link both sides of the property.
3	Lot1 DP751378	40.4	4.8	12%	Grazing	Partially affected including some severing.	Affected land to be acquired. An underpass has been allowed for in the design to link both sides of the property.
3	Lot101 DP1132126	4.0	0.5	13%	Tree & Shrub Cover	Partially affected including some severing.	RMS owned.
3	Lot108 DP751365	64.8	19.4	30%	Grazing	Materially affected due to severing and access issues. Also affects a structure.	RMS owned.
3	Lot2 DP1163451	12.2	6.7	55%	Tree & Shrub Cover	Materially affected due to percentage of property required and severing.	RMS owned.
4	Lot16 DP751372	16.8	1.0	6%	Cropping	Partially affected. New road severs property.	Affected land to be acquired. New access road proposed adjacent to severed portion provides an opportunity for access.
4	Lot42 DP751372	16.1	0.9	5%	Cropping	Partially affected. New road severs property.	Affected land to be acquired. New access road proposed adjacent to severed portion provides an opportunity for access.
4	Lot123 DP751372	12.2	1.2	10%	Cropping	Partially affected. New road severs larger farm.	Affected land to be acquired. New access road proposed adjacent to severed portion provides an opportunity for access.

Project section	Property lot and DP	Total property area (ha)	Area of impact (ha)	Percentage of property affected	Current land use for majority of the affected property area	Description of impacts	Potential management options
4	Lot113 DP751389	18.7	5.3	28%	Grazing	Partially affected, including some severing. The severed area to the east would probably have a change of land use from cropping to grazing.	Affected land and severed land to the east to be acquired.
4	Lot87 DP751389	16.5	5.4	32%	Grazing	Partially affected including some severing. Part of a larger holding.	Affected land to be acquired.
4	Lot89 DP751389	24.6	9.0	36%	Cropping	Partially affected including some severing. Part of a larger holding. A small cropping area on the east would probably have a change of land use from cropping to grazing.	Affected land to be acquired.
4	Lot3 DP751389	15.4	8.2	54%	Cropping	Materially affected due to severing and percentage of property required for project.	Affected land to be acquired. New access road proposed adjacent to severed portion provides access to the dwelling.
4	Lot3 DP787985	2.0	0.4	20%	Cropping	Materially affected due to a dwelling and farm buildings requiring demolition. The property is also severed.	Total property to be acquired.
4	Lot112 DP842062	38.1	7.5	20%	Cropping	Partially affected, including some severing and separation of the eastern side from the river. Despite the property being severed both sides would be accessible from public roads.	Affected land to be acquired. New access road proposed adjacent to severed portion to the east provides an opportunity for access. Allowance for drainage lines under the new road would need to be made to ensure this cropping land has access to water.
4	Lot2 DP751372	17.9	3.4	19%	Tree & Shrub Cover	Partially affected. Small portion severed on the western side.	Affected land and served land to the east to be acquired.

Project section	Property lot and DP	Total property area (ha)	Area of impact (ha)	Percentage of property affected	Current land use for majority of the affected property area	Description of impacts	Potential management options
	Lot1 DP751372	16.7	6.6	39%	Grazing	Materially affected due to percentage of lot required, severing and loss of a farm building.	Total property to be acquired.
4	Lot4 DP230180	6.0	4.6	76%	Cropping	Materially affected due to percentage of property required, severing and access issues.	Total property to be acquired.
4	Lot1 DP1012111	23.3	4.4	19%	Cropping	Materially affected due to severing of the parcel.	Affected land to be acquired. Despite the severing both parcels are accessible via the adjacent Byrons Lane which would pass across the new highway.
4	Lot15 DP1007618	18.1	2.0	11%	Cropping	Partially affected. A small portion to east will be severed.	The severed portion is part of a larger farm and should be usable despite the separation. Affected land to be acquired.
4	Lot6 DP835402	42.6	5.8	14%	Cropping	Materially affected due to severing.	Affected land to be acquired. The severed portions are indirectly accessible by a proposed new public access road.
4	Lot24 DP1007618	54.7	7.1	13%	Cropping	Partially affected, including a severed portion on the east.	Affected land and severed eastern portion to be acquire.
4	Lot1 DP1059272	12.7	1.8	14%	Cropping	Materially affected due to severing from farm enterprise to the east, and no road access.	Discussions to be held with landowner regarding access options for the eastern portion of the site. RMS appears to own land that could be used to give this parcel access to the current Pacific Highway. A total property acquisition may be required.



Project section	Property lot and DP	Total property area (ha)	Area of impact (ha)	Percentage of property affected	Current land use for majority of the affected property area	Description of impacts	Potential management options
4	Lot171 DP1134269	43.5	5.1	12%	Cropping	Materially affected due to severing.	Affected land to be acquired. Discussions are needed with landowner regarding viability of farming operation due to severing.
5	Lot17 DP230182	14.4	7.4	51%	Wetland	Materially affected due to percentage of property required and severing.	Affected land to be acquired,
8	Lot13 DP864108	14.8	2.5	17%	Grazing	Partially affected including some severing.	Affected land to be acquired. Access is available, adjacent to the canal, linking both sides of the property.
8	Lot18 DP864108	2.9	1.4	49%	Grazing	Materially affected due to severing and percentage of property required.	RMS owned.
8	Lot6 DP755624	15.7	5.5	35%	Grazing	Materially affected due to severing.	RMS owned.
8	Lot212 DP851963	141.0	6.6	5%	Grazing	Materially affected due to severing.	Affected land to be acquired. If access to the eastern portion of this lot is unable to be created consideration should be given to RMS also acquiring this land.
8	Lot121 DP1016479	45.6	1.4	3%	Cropping	Partially affected including a minor severing issue. An internal property track is also affected.	Affected land to be acquired. Consideration may be given to acquiring the small severed portion in the south east corner of the property. Project design includes provision for construction of a new access track.
8	Lot12 DP864108	68.3	7.8	11%	Grazing	Partially affected including some severing.	Affected land to be acquired. Access is available, adjacent to the canal, linking both sides of the property.
	Lot1 DP834562	10.7	2.8	26%	Grazing	Materially affected due to severing.	RMS owned.

Project section	Property lot and DP	Total property area (ha)	Area of impact (ha)	Percentage of property affected	Current land use for majority of the affected property area	Description of impacts	Potential management options
8	Lot14 DP801910	31.8	5.2	16%	Grazing	Partially affected including some severing.	Affected land to be acquired. Project design includes allowance for a track linking both sides of the property to be constructed under a nearby bridge.
8	Lot133 DP839607	40.0	7.8	19%	Grazing	Materially affected due to severing and a dwelling requiring demolition.	Discussions with landowner needed and total acquisition likely.
8	Lot140 DP755624	16.2	1.8	11%	Tree & Shrub Cover	Partially affected including minor severing.	RMS owned.
8	Lot104 DP755624	24.1	4.9	20%	Cropping	Materially affected due to severing.	RMS owned.
8	Lot206 DP755624	16.2	5.2	32%	Cropping	Materially affected due to severing.	Affected land to be acquired. Consideration should also be given to acquisition of the severed portion to the east.
8	Lot2 DP541041	41.9	7.1	17%	Cropping	Materially affected due to severing.	Affected land to be acquired. Consideration should also be given to acquisition of the severed portion to the south or creation of a track in the road reserve that links the two sides under a proposed highway bridge.
8	Lot1 DP1033046	1.5	0.2	17%	Conservation Area	Materially affected due to severing. A building is also affected.	Part of a larger holding that is Materially affected. Discussions with landowner needed and total acquisition likely.
8	Lot15 DP1053580	41.2	1.6	4%	Tree & Shrub Cover	Partially affected including minor severing of a north western portion.	Affected land to be acquired. Consideration given to the acquisition of the severed portion.
9	Lot2 DP818940	15.3	5.1	34%	Tree & Shrub Cover	Materially affected due to severing. Farm building also affected.	RMS owned.

Project section	Property lot and DP	Total property area (ha)	Area of impact (ha)	Percentage of property affected	Current land use for majority of the affected property area	Description of impacts	Potential management options
9	Lot3 DP229433	22.4	6.0	27%	Grazing	Materially affected due to severing.	Affected land to be acquired. Consideration should also be given to acquisition of the severed portion to the south.
9	Lot1 DP123848	12.5	1.3	11%	Grazing	Materially affected due to severing.	Affected land to be acquired. Consideration should also be given to acquisition of the severed portion to the south.
9	Lot2 DP614650	14.7	1.4	10%	Grazing	Materially affected due to severing.	Affected land to be acquired. Consideration should also be given to acquisition of the severed portion to the south.
9	Lot4 DP253906	24.3	5.5	23%	Grazing	Materially affected due to severing and impact upon quarry.	Discussions with landowner needed and total acquisition likely.
9	Lot2 DP1096808	24.0	1.5	6%	Grazing	Partially affected. Small severing and access issues.	Affected land to be acquired. New access track allowed for in the project design. Small severed portion to the south east may need to be acquired.
9	Lot224 DP1116373	28.8	2.6	9%	Grazing	Partially affected including some severing.	Affected land to be acquired. This property is part of a larger farm and the impacts of the new road would need to be discussed with the owner.
9 and 10	Lot6 DP1043232	67.5	17.9	26%	Cropping	Partially affected including some severing.	Affected land to be acquired. Project design includes allowance for a number of bridge structures which would allow passage of farm vehicles underneath.
10	Lot5 DP843369	50.5	6.2	12%	Grazing	Partially affected including some severing.	Affected land to be acquired. New linkages to both sides allowed for in the design.



Project section	Property lot and DP	Total property area (ha)	Area of impact (ha)	Percentage of property affected	Current land use for majority of the affected property area	Description of impacts	Potential management options
10	Lot2 DP585377	6.9	1.8	26%	Grazing	Partially affected including some minor severing.	Affected land to be acquired. Consideration could be given to acquisition of the small severed portion.
10	Lot2 DP1074389	2.7	1.5	56%	Grazing	Materially affected due to severing, access issues and percentage of property required.	RMS owned.
10	Lot232 DP755691	64.0	5.3	8%	Cropping	Materially affected due to severing.	Affected land to be acquired. Discussions with the owner would need to be held to determine whether a total acquisition can be justified.
10	Lot172 DP755691	32.5	8.8	27%	Cropping	Materially affected due to severing.	Affected land to be acquired. Severed portions are accessible via a proposed road.
10	Lot154 DP755731	16.7	2.6	16%	Cropping	Materially affected due to severing and access issues.	Affected land to be acquired. Severed land accessible via a proposed road.
10	Lot174 DP755731	40.2	3.1	8%	Cropping	Partially affected including some severing.	Affected land to be acquired. Severed land accessible via a proposed road.
10	Lot2 DP614714	39.5	26.6	67%	Urban	Materially affected due to severing and percentage of property required.	Total acquisition likely unless its owner would prefer to retain farming land.
10	Lot2 DP787102	46.4	6.0	13%	Cropping	Materially affected due to severing of the eastern portion.	Affected land to be acquired. Acquisition may include severed eastern portion, depending on the outcome of future research and discussions with the owner.
10	Lot61 DP1088684	41.9	12.4	30%	Grazing	Materially affected due to severing and an affected dwelling.	Total acquisition.

### 16.3.8 Agricultural land

The project's impacts on agricultural land would include loss of land (including regionally significant farmland), fragmentation and severance of properties, and short-term impacts during construction. These impacts are presented below.

#### Directly affected agricultural land

The project would require the total or partial acquisition of agricultural land, which would directly impact about 290 agricultural properties, mainly used for cropping, grazing and horticulture. About 148 individual land owners with agricultural interests would be directly affected by the project. These include around 57 land owners with cropping activities (including sugar cane farmers), around 88 land owners with grazing land, and three land owners with a mix of horticultural interests.

While the loss of agricultural land and agricultural properties may be significant for directly impacted farmers and local farming communities, regionally, the amount of agricultural land acquired for the project, including regionally significant farmland, is considered relatively minor, comprising around 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 from the project is expected to be minor across the study area, resulting in:

- A loss of around 1.8 per cent in land producing irrigated vegetables and herbs. This equates to about one hectare in the study area
- A loss of around 0.7 per cent in aquaculture use. This equates to about 2.5 hectares of land area used for this crop in the study area
- A loss of around 0.9 per cent of sugarcane producing land. This equates to about 319 hectares of total sugarcane land in the study area
- A loss of around 2 per cent of vine fruits producing land. This equates to about 0.5 hectares of land for this crop in the study area
- A loss of around 0.01 per cent in tree nuts (eg macadamias) producing land. This equates to about 1 hectare of land for this crop in the study area.



**Photo 6: Mosaic of productive land at Broadwater – Evans Head Road**

### 16.3.9 Fragmentation and severance of agricultural properties

This issue (also covered in Section 16.3.8), is a particular concern for primary agricultural producers.

The fragmentation and severance of agricultural properties would impact on the operation, productivity or viability of some properties and businesses.

Acquisition of agricultural land for the project may also result in some residual land parcels being too small, or poorly configured, to maintain the existing agricultural activity. This could result in changes from relatively intensive agricultural land uses (eg macadamias) to lower intensity uses such as grazing.

To minimise potential impacts on agricultural land uses:

- The project would be located adjacent to the existing highway, where possible
- Ancillary facilities would be located within the operational footprint of the project to avoid the need for additional land, where possible

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. RMS would negotiate individual property access requirements with individual land users. Where the provision of underpasses is not considered economically viable and suitable alternative access is not available, affected land could be acquired in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991* and RMS' Land Acquisition Policy (RTA, 1999). This land could be made available for purchase by other agricultural producers.



### 16.3.10 Regionally significant farmland

Where possible, impacts on regionally significant farmland have been minimised by avoiding these areas and limiting construction works to the project's footprint. However, as shown in Figure 16-1, the project would affect some areas of regionally significant farmland particularly through sections 5, 6, 7 and 8. The project would directly impact around 386 hectares of regionally significant farmland. This represents less than 0.14 per cent of farmland identified as regionally significant in the Northern Rivers and Mid North Coast regions. Whilst the loss of regionally significant farmland is significant for individual farmers and the farming community across the project, the loss is minor when considered in the context of the wider region.

### 16.3.11 Agricultural uses, food production, and rural industries

During consultation, property owners raised a number of concerns regarding potential impacts on agricultural land uses. These concerns relate to:

- The relocation of cane pads: Cane pads are the collection areas from where sugarcane is transported to the mill. The project would require the relocation of around four cane pad areas due to the acquisition of agricultural land and the location of the project isolating some sugarcane land from cane pads. Because the location of cane pads is critical to the operation of sugarcane properties, the relocation of cane pads would be undertaken in consultation with cane-growers and affected property owners. Affected cane pads which would be impacted by the project and require relocation include those at Byrons Lane (Tyndale), Norleys Lane (Shark Creek), Causleys Lane, (Gulmarrad), and north of Causleys Lane (Gulmarrad). These sites are all located within Section 4 of the project, between Tyndale and Maclean
- Sugar cane land would be required by the project (around 320 hectares combined within Clarence Valley, Richmond Valley and Ballina Shire local government areas). This could potentially include land used to supply the Broadwater and Harwood sugar mills / refinery. Whilst the design has sought to minimise the amount of cane land impacted, some land is still affected. Consultation with cane growers and the sugar industry is on-going as part of 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
- Impacts on agricultural properties including land used for cropping, grazing, horticulture and associated uses including farm dams and cattle yards
- The potential for the road to increase flooding of agricultural land: Concerns relate to longer inundation times, increased flood levels, and erosion. The potential impacts of the project on changes to flooding and flood behaviour are discussed in the Working Paper – Hydrology and flooding
- The potential impacts on the Berry Exchange from the project's proximity to farmland used for raspberry and blueberry cultivation: The Berry Exchange, located at Range Road, Corindi, has raised concerns about potential impacts of the project's construction and operation, as well as impacts of the Berry Exchange's operations on nearby construction activities. These included potential impacts on:
  - Nearby construction workers from pesticides used by the Berry Exchange
  - The Berry Exchange from pesticides used during construction
  - Blueberry plants from increased dust during construction
  - Access to the Berry Exchange, including access for workers during the peak berry-picking season.

To minimise impacts on the Berry Exchange:

- Environmental management measures would be implemented to minimise potential impacts on blueberry plants and the Berry Exchange operations
- Where pesticides are proposed during construction, spraying would be undertaken in accordance with the appropriate environmental procedures to minimise potential impacts on adjoining properties
- RMS would undertake ongoing consultation and communication 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.



**Photo 7: View from Harwood Island of the sugar mill at Harwood.**

### **16.3.12 Agricultural diseases, quarantined properties and travelling stock reserves**

The project would not affect any properties that are currently quarantined by the Livestock Health and Pest Authority or listed by the Authority as having agricultural diseases.

In addition, the project would not directly affect any travelling stock reserves.

During construction, some agricultural land outside of the operational footprint would also be leased for ancillary facilities. This would result in temporary disruption to agricultural activities on that land for the duration of construction. Following construction, the land would be rehabilitated in line with the projects remnant land use strategy.

In addition, there may be potential impacts from the spread of weeds, soil diseases and pests between properties. The Berry Exchange identified this as a particular concern for blueberry plants. The implementation of appropriate environmental management measures (eg vehicle washdown procedures) would be important in minimising potential impacts on farming properties.

### 16.3.13 National parks, reserves and conservation areas

The project would pass through or adjacent to:

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

The project would be located to minimise direct impacts on these areas. However, the operational footprint of the project would be within some of these areas, including land reserved under the *National Parks and Wildlife Act 1974*, which would result in a loss of land. Acquisition and revocation of that land would be required in accordance with the *National Parks and Wildlife Act 1974* and in consultation with the Office of Environment and Heritage. The project would also pass through a number of areas comprising tree and shrub cover that have environmental or conservation values.

The project would also have a range of potential indirect impacts on conservation lands. These direct and indirect impacts are presented below.

Potential impacts of the project on the ecological and conservation values of national parks, reserves and conservation areas are discussed in the Working Paper - Biodiversity, which is summarised in Chapter 10 (Biodiversity).

#### Broadwater National Park

The Pacific Highway currently passes through Broadwater National Park. The project would involve widening the western side of the highway. This would require the acquisition of about 17 hectares of land within the national park. 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. This is because:

- Access to fire tracks within the national park would be maintained during construction and operation of the project.
- Public access to the national park would be maintained via the current access on Woodburn–Evans Head Road and Broadwater–Evans Head Road. Interchanges would be provided to both of these roads from the Pacific Highway
- Dedicated fauna overpasses would be provided, corresponding with known wildlife corridors to allow fauna to cross the project. Two fauna overpasses are proposed at station 138.8 and 139.9. Appropriate fauna fencing would be installed to prevent fauna obtaining direct access to the highway. A typical land bridge would be around 70–90 metres long and 12 metres wide.

#### 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. Widening the road corridor would occur west of the existing Pacific Highway, avoiding direct impacts on the nature reserve. A fauna overpass is proposed adjacent to the Tabbimoble Nature Reserve.

#### Yaegl Nature Reserve

The Yaegl Nature Reserve is located east of Maclean. The existing Pacific Highway is mainly located adjacent to the western and northern boundaries of the nature reserve. Widening the highway would directly impact around 1.7 hectares of land within the nature reserve.

The acquisition of land for the project would not affect the use, operation or integrity of the nature reserve. This is because 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 Yaegl Nature Reserve and to Koala Drive would be maintained via the underpass of the Pacific Highway.



## Wells Crossing Flora Reserve

Wells Crossing Flora Reserve, north of Halfway Creek, is located east of the existing Pacific Highway within the Newfoundland State Forest. The project is aligned close to the east of the existing highway. The project would affect around 40 hectares of the reserve, changing its land use from conservation to transport corridor. While the project would directly affect the reserve and its principle purpose, which includes the protection of *Eucalyptus tetrapleura*, it is considered the design offers the best overall outcome at this location. This is because the wide medians within the project between station 22.5 and 23.8 allow for some vegetation retention and fauna connectivity (via a dedicated fauna underpass). For more detail on this issue see Working paper – Biodiversity (SKM, 2012b).

Acquisition of the flora reserve is not anticipated to require revocation as land reserved under the *National Parks and Wildlife Act 1974*.

## 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.

## Native vegetation areas outside of conservation reserves

The project would impact on native vegetation areas along its length, resulting in a change in land use from tree and shrub cover to transport corridor. The project would also result in the fragmentation of some larger areas of native vegetation.

During construction, ancillary sites and temporary detention basins would be located within the project boundary, where possible. This would help to minimise additional impacts on areas of tree and shrub cover and the amount of vegetation clearing required. However, there are some locations where temporary detention basins would extend beyond the project boundary, impacting on small areas of native vegetation. These areas would be rehabilitated following construction.

### 16.3.14 State forests

The project would directly impact seven State forest areas and one flora reserve located within an area of State forest. The northeast region of NSW, which includes the project, has about 450,000 hectares of State forest (Forests NSW Annual Report 2010-11). The project requires the acquisition of about 204 hectares of State forest which is less than 0.05% of the State forest area in the region. The acquisition of State forests would be undertaken in accordance with the *Forestry Act 1916*. State forests directly impacted by the project are listed in Table 16-2.

**Table 16-2: State forests impacted by the project**

State forest	Impacted area (hectares)	Description of impacts	Forest management zones, and estimated area of impact (approximations only)
Wedding Bells State Forest	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 (1 ha) Zone 4 – general management zone (3 ha) Zone 7 – non forestry use zone (1 ha) Zone 8 – areas for further assessment (1 ha)
Newfoundland State Forest (and Wells Crossing Flora Reserve)	44.5	Loss of forestry land due to widening of existing highway corridor and construction of new access roads to connect the Pacific Highway service road to Bald Knob Tickgate Road and Franklins Road under the	Zone 1 – special protection zone (40 ha) Zone 3b – special prescription zone (3.5 ha) Zone 4 – general management zone (0.2 ha) Zone 8 – areas for further

State forest	Impacted area (hectares)	Description of impacts	Forest management zones, and estimated area of impact (approximations only)
		motorway standard arrangement. Impact and direct loss of land within 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 station 22.5 and 23.8. Of the 44.5 hectares of state forest affected, around 40 hectares is flora reserve.	assessment (0.8 ha)
Glenugie State Forest (excluding part of corridor within Glenugie upgrade project)	98	Loss of forestry land due to widening of existing highway, construction of new interchanges at Glenugie and Eight Mile Lane, and realignment of highway north of Glenugie interchange.	Zone 3a – harvesting exclusions zone (17.5 ha) Zone 3b – special prescription zone (23.5 ha) Zone 4 – general management zone (42 ha) Zone 8 – areas for further assessment (15 ha)
Pine Brush State Forest	16.4	Loss of forestry land due to the project alignment.	Zone 3a – harvesting exclusions zone (9 ha) Zone 4 – general management zone (7ha) Zone 8 – areas for further assessment (0.4 ha)
Mororo State Forest	1.9	Loss of forestry land due to the project alignment.	Zone 3a – harvesting exclusions zone (0.05 ha) Zone 3b – special prescription zone (1.3 ha) Zone 8 – areas for further assessment (0.6 ha)
Tabbimoble State Forest	6.3	Loss of forestry land due to widening of existing highway and minor realignment of small sections	Zone 3a – harvesting exclusions zone (3 ha) Zone 3b – special prescription zone (3 ha) Zone 8 – areas for further assessment (0.3 ha)
Doubleduke State Forest	31.1	Loss of forestry land due to widening of existing highway and minor realignment of small sections	Zone 3a – harvesting exclusions zone (9 ha) Zone 3b – special prescription zone (15 ha) Zone 4 – general management zone (2 ha) Zone 8 – areas for further assessment (5 ha)

For most State forests, these impacts would be caused by widening of the highway, which would result in minimal impacts on the use and operation of the state forest. This would also reduce the potential for fragmentation and sterilisation of forestry resources. At Pine Brush and Mororo state forests, the highway would be realigned, with the following effects:

- Pine Brush: The realignment of the highway between Glenugie and Tyndale would result in the project being located along the western boundary of Pine Brush State Forest, located north-east of Tucabia. This would minimise impacts on the use and operation of the state forest, and avoid potential for fragmentation and sterilisation
- Mororo: The highway currently forms the eastern boundary of the Mororo State Forest. The minor realignment of the highway to the west would result in encroachment on the state forest. The project design has allowed for alternative access to State forest areas where access would be impacted.

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 details of State forest road network impacts, refer to Chapter 14 (Traffic and transport) which includes mapping.

The Department of Primary Industries has raised a number of issues in relation to the continued operation of State forests that would be affected by the project. These mainly relate to changes in access to the State forests and the need to ensure that service roads allow for B-double trucks. Accordingly, the project has been designed to maintain access to the State forests via new service roads or the existing highway where the project boundary is realigned. These would allow continued use by B-double trucks (further discussion about changes to local access is provided in the Working paper – Traffic and transport (SKM, 2012c))

The Department of Primary Industries also raised issues about the impact of the project on boundary fire trails within those areas of State forest to be acquired. Accordingly, fire trails impacted by the project would be relocated in consultation with the Department of Primary Industries.

During construction, potential impacts on areas of State forest may result from the temporary use of land for construction activities such as ancillary facilities or temporary sedimentation basins. Any areas used would be rehabilitated in consultation with the Department of Primary Industries.

The project would impact on private forestry during construction, where a change in land use could occur if land is acquired, which is currently used for private forestry.



### 16.3.15 NSW Government land

The impact on Crown Land would be relatively minor, with 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.

Around 21 hectares of land owned by local governments would be directly affected by the project across the local government areas of Coffs Harbour, Clarence Valley, Richmond Valley, and Ballina Shire Councils. In certain instances, reserve land is managed under Trust. Existing land uses affected are mainly grazing, tree / shrub cover and transport corridor with most land located in Clarence Valley.

A summary of impacts is shown in Table 16-3. For details refer to Working paper – Land use and property.



**Photo 8: View of the recently opened Glenugie upgrade adjacent to Glenugie State Forest**

Table 16-3: 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 (former landfill)	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 (former landfill)	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
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

Property ID	Lot/ DP	Crown Land	Existing land use	Total property area (ha)	Total impacted area (ha)	Description of impact
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 (Preservation of Graves)	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
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: A 2007 heritage investigation completed by Richmond Valley Council indicated that no known burials took place at this site

### 16.3.16 Natural resources

#### Mining and petroleum production

The project would traverse land subject to existing mining and petroleum exploration licences, including licences relating to coal seam gas. 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.

Ongoing consultation with the coal seam gas proponents operating in the study area and the relevant NSW State government agency would be undertaken during the detailed design and construction phases of the project to minimise impacts on future coal seam gas production.

#### Quarries

There are seven properties comprising quarries that would be partially or wholly acquired for the project (refer to Table 16-4). These are mainly used to quarry stone, sand, chert and related materials. This 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.

**Table 16-4: Quarry land affected by the project**

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

There are also several quarries located within about one kilometre of the project boundary, including at least two within 500 metres. The project may have potential impacts on these quarries due to restrictions on some activities, such as blasting. This may require a change in the operations and management of these quarries.

Quarry locations within the project study area (and adjacent local government areas) are shown in Figure 16-14. Land use impacts and quarries are shown in Figure 16-15, Figure 16-16 and Figure 16-17.



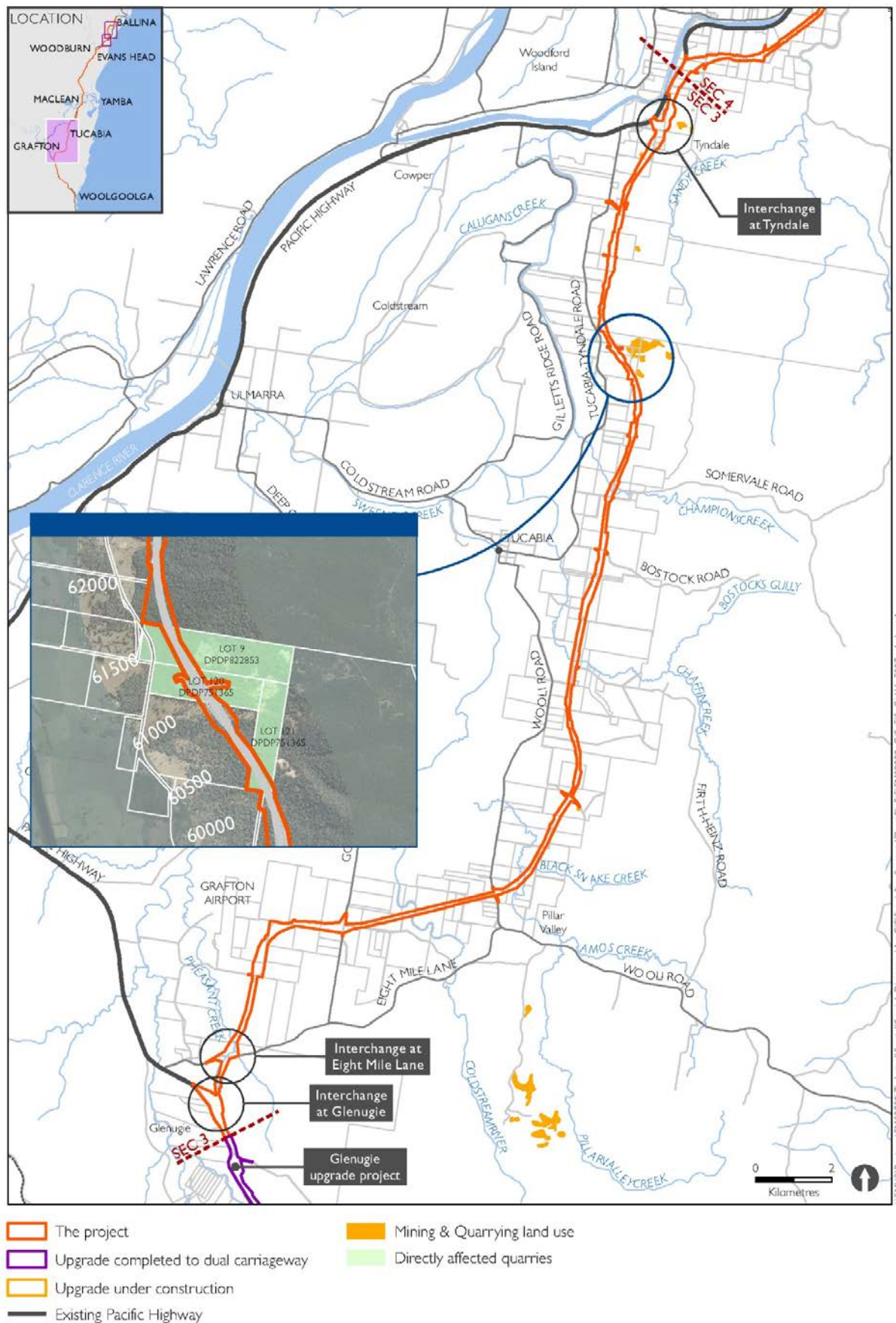
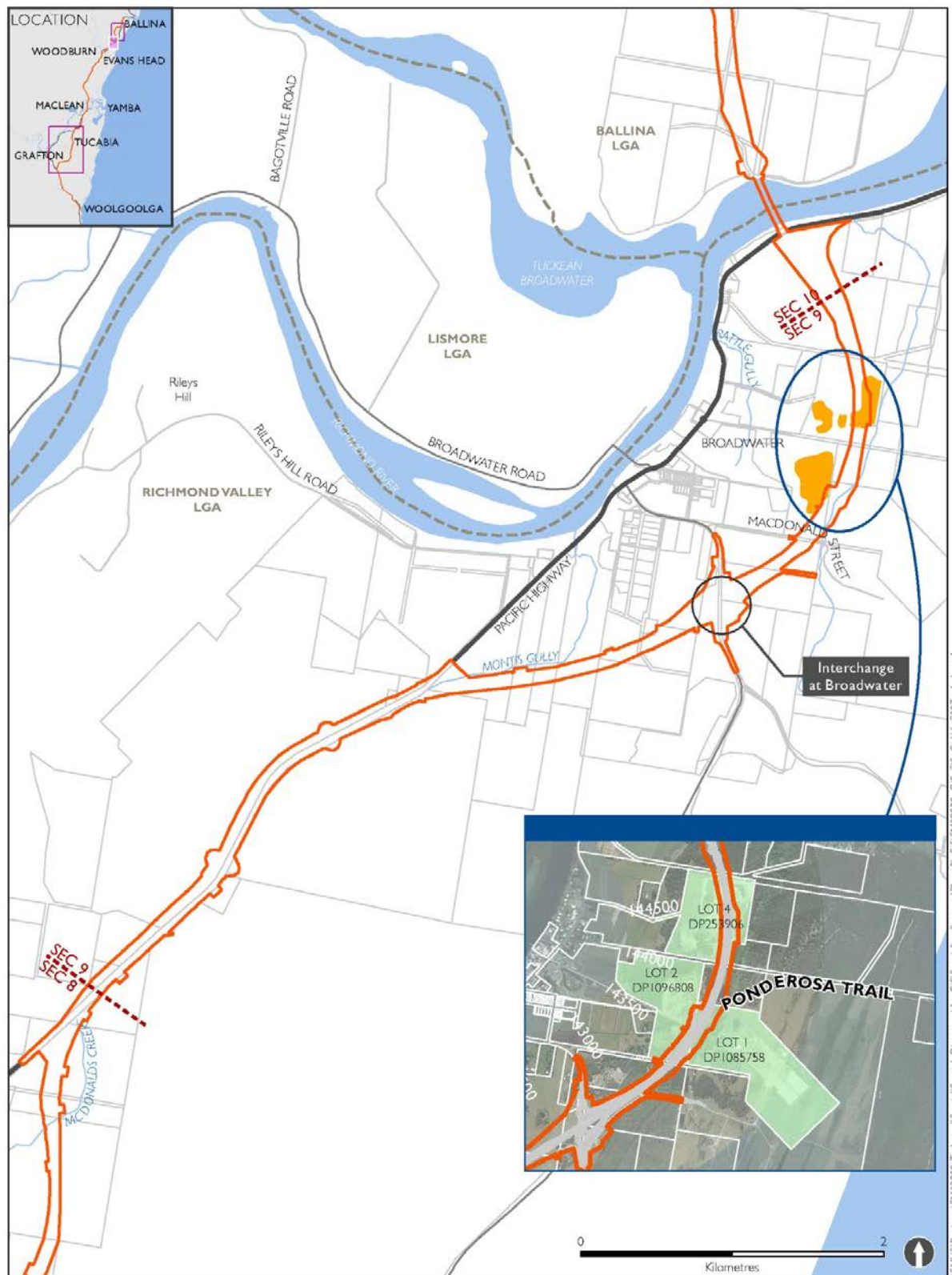
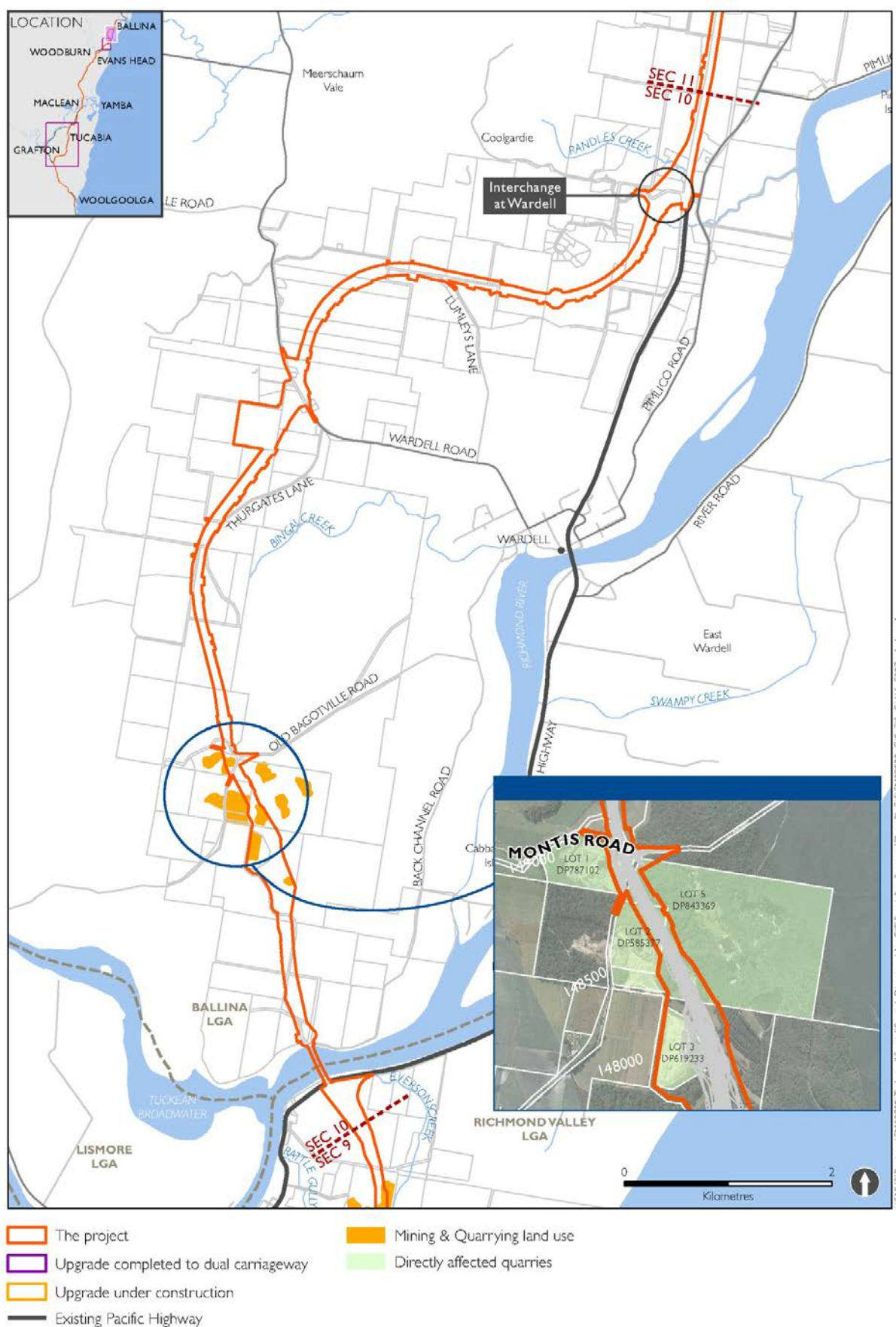


Figure 16-15: Quarries impacted at Tucabia



**Figure 16-16: Quarries impacted at Broadwater**





**Figure 16-17: Quarries impacted at Bagotville**

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

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

Roads and Maritime Services 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.

Information on quarry materials required for the project, including potential sources and access routes, is provided in Chapter 6 (Description of the project – construction).

### **16.3.17 Commercial fishing and aquaculture**

Construction and operation of the project would not directly impact commercial fishing 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. The bridges have been designed to minimise long-term impacts on river users. Potential impacts of the project's construction and operation on fishing operations include:

- The potential for trawl nets and fishing lines to become entangled in construction vessels, plant and equipment
- Restricting on access for trawlers and recreational fishers when construction vessels are manoeuvring or working in-stream
- Impacts to water quality and fishery habitats including 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).

Consultation with the NSW Department of Primary Industries (Fisheries) regarding the duration and timing of construction activities should be undertaken prior to and during construction of the bridge crossing of the Clarence River. Consultation should also be undertaken with commercial fishers operators within the Clarence River estuary prawn trawl fishery, and estuary general fishery, as well as recreational fishers. In particular, prawn stocks including school prawns caught using prawn set pocket nets would be potentially sensitive to construction impacts.

Similarly, consultation should be undertaken with licensed recreational and commercial fishing operators regarding construction of the bridge crossing of the Richmond River, to ensure potential impacts of construction activities, including river access, are appropriately managed.

### **Temporary impacts on access**

Indirect impacts may occur from construction of the Harwood and Broadwater bridges. In particular, construction works within these rivers would require restrictions on boat movements, potentially impacting on access for river users. Ongoing consultation and communication with river users, including commercial fishing operators about construction activities, would help to manage potential impacts on these users.



## Aquaculture

There are no oyster priority areas located near 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 (DPI, 2006).

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.

The implementation of environmental management measures would help to minimise potential impacts on waterways such as the Clarence and Richmond rivers. In particular, temporary construction basins would be established during construction to capture stormwater runoff from earthworks and prevent it entering rivers and waterways.

Permanent stormwater detention basins would also be established along the project boundary to capture and treat stormwater runoff prior to it being released into the environment. This would reduce the risks to water quality.

Water quality issues are discussed in Chapter 9 (Soils, sediments and water quality).

### 16.3.18 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 adjustment to existing services, relocation of some services where they cross the highway, and/or the implementation of protection measures. No impacts on infrastructure or utilities are expected outside of the project boundary.

The relocation or adjustment of infrastructure and utilities for the project may result in some temporary disruptions for nearby neighbours during these works. However, careful planning would ensure these disruptions are minimised and impacts are appropriately managed. This would include:

- Communicating with nearby communities about the timing and duration of potential disruptions
- Ongoing consultation with service providers during the detailed design phase to verify specific impacts on infrastructure and utilities.

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 the main and the project.

The project traverses the catchment for the Rous Water borefield at Woodburn. The project is located on fill embankment in this section. 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. Potential impacts on the borefield are further discussed in the Working paper – Groundwater.

## 16.4 Management of impacts

As outlined in this chapter, the project includes a range of measures for managing, avoiding or mitigating potential property and land use impacts and maximising or enhancing the project's potential benefits. The proposed mitigation measures are listed in Table 16-5.

### Land acquisition

Land would need to be acquired in order to construct the project. Acquisition of land will in the first instance be by negotiation between the landholder and RMS.

Acquired land not required for the project would generally be disposed of by public auction or tender. A remnant land and property strategy has been prepared for the project to identify options for surplus property (this is included in Section 5 of the Working Paper – Land use and property (SKM, 2012a).

The land acquisition strategy for the project seeks to address issues of land severance and sterilisation. Where the project results in land severance or sterilisation, affected properties have been identified for potential acquisition (see Appendix A and B of the Working Paper – Land use and property (SKM, 2012a)). Consolidation of severed land could occur through amalgamating residual land and creating new accesses and/or rehabilitating surplus land for sale (or transfer of ownership) to offset loss of similar land required for the project.

**Table 16-5: Land use and property mitigation measures**

Issue	Mitigation ID no.	Mitigation measure	Timing	Relevant section
Property acquisition and managing surplus land	LU1	Undertake ongoing communication and consultation with directly affected property owners about the property acquisition process. This includes the provision of information on the timing of acquisitions, and the process for property acquisitions under the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> and RMS' Land Acquisition Policy (RTA, 1999).	Pre-construction	All
	LU2	Undertake ongoing 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 would relate to matters such as adjustments to fencing, access, farm infrastructure and relocation of impacted ancillary structures, as required.	Pre-construction	All
	LU3	Complete property adjustments for fencing, access tracks, cattle underpasses and other farm infrastructure in consultation with the impacted land owner.	Pre-construction	All
	LU4	Minimise sterilisation and severance of land uses and lots by amalgamating severed parcels of land together, where possible, with provision of road access	Pre-construction	All
	LU5	Where required, undertake acquisition of State forests in accordance with the provisions of the <i>Forestry Act 1916</i> . Revocation of land dedicated or reserved as national parks or nature reserves would be in accordance with the <i>National Parks and Wildlife Act 1974</i> . Acquisition of land owned by Local Aboriginal Land Councils would be in accordance with the provisions of the <i>Aboriginal Land Rights Act 1983</i> .	Pre-construction	All
	LU6	A remnant land strategy to minimise land use severance and sterilisation, and a mitigation strategy for final land uses would be developed in consultation with the Cane industry, Coffs Harbour City, Clarence Valley, Richmond Valley and Ballina Councils.	Pre-construction	All
Property access during construction	LU7	Maintain access to properties near construction works, including where required for the movement of farm equipment and livestock between properties.	Construction	All
	LU8	Where temporary changes to property access are required during construction, determine alternative access in consultation with affected property owners and tenants.	Construction	All
	LU9	Undertake ongoing communication with local communities about changes to the local road network, including likely delays and disruptions and alternative accesses if required.	Construction	All

Issue	Mitigation ID no.	Mitigation measure	Timing	Relevant section
Local amenity during construction	LU10	Undertake early and ongoing consultation and communication with residents and local communities closest to construction works about construction activities, including timing, duration and likely impacts. This is particularly important where works are proposed outside standard daytime construction hours.	Construction	All
Construction impacts to primary industry, including forestry, and agriculture uses	LU11	Develop a spoil management plan to manage surplus spoil from construction. Where possible, onsite reuse 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 spoil management plan.	Construction	All
	LU12	Forests NSW would harvest millable timber in affected State forests prior to works commencing. However, consideration should also be given to opportunities for the productive use of trees removed from non State forest areas of the project, including ancillary facilities where necessary.	Construction	All
	LU13	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.	Construction	All
	LU14	Where pesticides are required during construction, implement appropriate environmental management measures to avoid potential impacts on adjoining agricultural properties.	Construction	All
	LU15	Undertake ongoing consultation and communication with managers of agricultural properties to identify any potential impacts on nearby construction workers from farm operations (ie use of pesticides on agricultural properties).	Construction	All
	LU16	Undertake ongoing consultation and communication with commercial fishing and relevant aquaculture operators about construction activities within and near the Clarence and Richmond rivers. Stakeholders would include the estuary prawn trawl fishery, and estuary general fishery within the Clarence River, the NSW Department of Primary Industries (Fisheries) and licensed fishing interests within the Richmond River regarding the timing and duration of construction, potential impacts (including changes to river access) and proposed mitigation measures.	Construction	All
Utilities and infrastructure	LU17	Where relocation or adjustment of infrastructure is required, these should be planned to minimise disruptions and impacts on surrounding properties.	Construction	All
	LU18	Communicate with nearby communities about the timing and duration of potential disruptions to infrastructure.	Construction	All



Issue	Mitigation ID no.	Mitigation measure	Timing	Relevant section
Property management	LU19	Ensure RMS' land that is required for the project is appropriately maintained. This would be undertaken by regional RMS officers or a designated local authority. RMS would manage the leasing and maintenance of property identified as suitable for tenants.	Operation	All
	LU20	Ensure that excavation works near Lot7008 DP92609 are carefully managed in consultation with Richmond Valley Council to minimise potential impacts on any unknown heritage items including potential burials.	Construction	9
Operational impacts to primary industries, including forestry, agriculture and aquaculture	LU21	Undertake ongoing consultation with owners of agricultural properties affected by the project – through acquisition, changes to local access or fragmentation of properties – about potential impacts farming operations and potential measures to manage or mitigate identified impacts.	Operation	All
	LU22	Consult with Forests NSW regarding access to and within State forests where required, in accordance with the <i>Forestry Act 1916</i> .	Operation	All
	LU23	Consult with Forests NSW about the relocation of fire trails directly impacted by the project's construction or operation.	Operation	All
	LU24	Revegetate land as appropriate, particularly where are ecological and/or landscape opportunities.	Operation	All
	LU25	Identify suitable locations for relocated cane pads and restore affected cane drains where possible in consultation with cane-growers and affected property owners.	Operation	All
Property access	LU26	As far as possible, reinstate or provide new property accesses to replace those that are lost or modified, in consultation with impacted landowners.	Operation	All
	LU27	The tie in to the existing highway and land requirement for the property at station 145.0 would be reviewed at the detailed design stage.	Pre-construction	9
Mining and petroleum production	LU28	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	Pre-construction	3, 9, 10

Issue	Mitigation ID no.	Mitigation measure	Timing	Relevant section
	LU29	Undertake ongoing consultation with the coal seam gas proponents operating in the study area and the relevant State Government agency to ensure that impacts on the project and on future coal seam gas production are minimised.	Operation	All
Utilities and infrastructure	LU30	Undertake ongoing consultation with service providers to verify locations and specific impacts on infrastructure and utilities.	Operation	All
	LU31	Undertake consultation with Richmond Valley Council during the detailed design phase, regarding the location and timing of the Broadwater Sewerage Scheme rising pump station, located off Broadwater-Evans Head road.	Pre-construction	9

## References

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Roads and Traffic Authority (RTA) 1999, *Roads and Maritime Services Land Acquisition Policy*, Roads and Traffic Authority of NSW, Sydney, Australia.

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