_Landscape character assessment

02

02____Landscape character summary

2.1_ Introduction

Landscape character is the aggregate of built, natural and cultural aspects that make up an area and provide its unique sense of place. Landscape in this context is taken to include all aspects of a tract of land – the built, planted and natural topographical and ecological features.

Landscape character assessment has been undertaken with reference to the RMS guide note *Guidelines for Landscape Character and Visual Impact Assessment*. Accordingly, the following landscape character assessment is based on a broad-scale regional review of significant topography, vegetation, land use and settlement patterns in the study area. This information was used to determine a series of different landscape types. The particular spacial qualities of each landscape type was further investigated to determine precinct types based on identifiable landscape elements.

2.2_ Character overview

The study area for this landscape character impact assessment is a four kilometre corridor along the alignment of the project. The study area corridor is shown on the series of landscape character assessment plans contained in this section.

The study area is defined largely by the interplay of tall eucalypt forests divided by crop and pasture land, townships and interspersed farms and homesteads, the presence of mountains, the occasional glimpse of the ocean, and the great rivers that meander across the coastal plains.

The study area also features a number of the key natural landmarks of the region and the Pacific Highway. The Clarence and Richmond rivers, prominent topographical formations, and townships along the route, are important milestones along the journey. Water is a major landscape feature, rivers, their tributaries, and other creeks and wetlands; all of which have shaped the landscape.

Vegetation is also a defining feature in the existing landscape. In broad terms, the vegetation characters include woodland and grazing and woodland hills and sugarcane country as described in section 2.2.2 of this report.

In addition to these natural features, the urban settlements along the highway add to a continuous and repeating pattern that occurs within the landscape. Within the urban landscape a number of heritage items of state and local significance are identified along the alignment of the project. The characteristics and heritage significance of these items is addressed in detail in the *Historical (non- Aboriginal) Heritage Assessment, 4 July 2012, Rev E.* The items identified comprise state and local listed items, notably including (refer Figure 01):
_New Italy Settlement Sites and Vineyard Haven (state significance),
_High Conservation Value Old Growth Forest (state significance), and
_Harwood Heritage Conservation Area (local significance).
As noted above the landscape character assessment seeks to provide an aggregate assessment of built, natural and cultural aspects in the landscape. This broad assessment does not specifically address single cultural heritage or other items. The heritage items listed above are considered in further detail in the visual impact assessment in Section 3.

02____Landscape character summary

2.2.1_ Topography

The study area is generally defined by two strong topographical features: the undulating forested sections of The Great Dividing Range; and the expansive floodplains of the Clarence and Richmond rivers.

The Great Dividing Range runs throughout the study area, dividing the coastal floodplains from the more undulating, forested inland regions. The pronounced undulating hill ranges define the project's eastern and western edges and in some areas, bisect it.

The expansive floodplains of the Clarence and Richmond river systems provide a easily recognisable topographical zone, and are key natural landmarks. Together, the interplay of undulating forest and floodplain define the project corridor.

2.2.2_ Vegetation

The existing character of the Pacific Highway and surrounds is generally defined by topography, land-use, and natural features such as rivers and creeks. In broad terms, the study area vegetation characters are:

_Woodland and grazing – rolling hills and floodplains
_Woodland hills and sugarcane country – rolling hills and floodplains

Within the study area, there are a number of protected vegetation areas including:

_Yuraygir conservation area
_Yaegl, Mororo Creek, Tabbimoble swamp, Tuckean, and Uralba nature reserves
_Wedding Bells, Barcoongere, Glenugie, Pine Brush, Mororo, Devils Pulpit, and Tabbimoble state forests
_Bundjalung and Broadwater national parks

02____Landscape character summary

2.2.3_ Land use

Major land uses in the area include commercial fishing, tourism and a range of agricultural pursuits. Cane farming and pastoral activities dominate the floodplains flanking the Clarence and Richmond river systems.

The region is also rich in timber production, forestry, dairy, beef, horticulture, tea tree, and blueberries.

The hills and ridges support dense stands of vegetation cover, generally suggesting land not suitable for farming.




2.2.4_ Settlement patterns

The overall settlement pattern of the region is dispersed with rural residential development, linked by villages and townships located on rivers or the coast.

The major townships within the study area include Corindi Beach, Tucabia, Tyndale, Gulmarrad, Maclean, Townsend, Harwood, Woodburn, Broadwater, and Wardell.

Isolated pockets of residential development on the higher slopes throughout the study area offer panoramic views over the Clarence and Richmond river floodplains and east coast.




02____Landscape character summary

2.3_ Landscape types within the study area

Based on the broad scale review of topography, vegetation, land use and settlement patterns in the existing landscape the study area has been classified into 10 common landscape types as follows:

_Floodplain
_Cleared land (pasture)
_Cultivated land (crops)
_Valley lands – foothills
_Open woodland
_Forest
_Littoral scrub
_Ranges and hill tops
_Waterways
_Urban settlement

02____Landscape character summary

2.3.1_ Floodplain

This landscape character type is dominated by flat lands adjacent to a stream or river that experiences occasional or periodic flooding. This landscape type is generally used for pasture and crop production.

Due to the prominence of the Clarence and Richmond rivers, their tributaries including the Coldstream river, and the watershed from the Great Dividing Range within the study area, the floodplain landscape character of the study area is a dominant and constantly changing landscape feature.

The character of the floodplains reinforces the common theme of the Pacific Highway between Woolgoolga to Ballina; forests divided by floodplains with crop and pasture lands, river crossings, and interspersed small towns.

01_ Richmond River floodplain

02_ Riparian vegetation within floodplain

2.3.2_ Cleared land (pasture)

Characterised by extensive pasture grasses dotted with small copses of trees and fingers of riparian vegetation, this type forms a major vegetation type of the study area.

Pockets of pasture are found within open woodland and forested sections of the highway corridor. Within the floodplain, cleared pasture land is interspersed within the dominant cultivated lands.

Major agricultural development is situated on alluvial area of the flood plain where soils are less leached. Where soils are poorer, one of the chief industries is cattle grazing.

The cleared pasture land highlights the rural and semi rural landscape that characterises the project corridor.

01_ Pastureland along Old Six Mile Lane, Glenugie

02_ Grasslands within floodplain

02____Landscape character summary

2.3.3_ Cultivated lands (crops)

Within the study area, this landscape character is dominated by sugarcane plantations, which form a striking, unique element within the landscape. The character of this zone changes as crops are harvested and fields fallowed according to crop rotation, creating an alternating cycle of open and closed views.

Sugarcane is the dominant crop and is grown intensively on the lower Clarence, especially around Maclean, Harwood Island, Chatsworth island and Palmers Island; from south of Tyndale to south of Mororo. Sugarcane is also grown extensively throughout the lower Richmond, especially around Woodburn, and stretches north to Ballina.

The study area also features a large, broad-scale blueberry plantation within the Dirty Creek Range west of the current highway alignment, north of Corindi.

01_ Sugarcane west of Richmond River

02_ Sugarcane with Cooks Hill as backdrop

2.3.4_ Valley lands – foothills

Valley lands and foothills cover a relatively limited extent along the study area. They occur at the intersection of the flood plain and the coastal ranges and are the transitional landscape between flood plain and ridge. They are characterised by rolling hills of gentle gradients which are either cleared, partially cleared or forested.

The vegetation cover reflects this transitional nature; having pasture, open woodland and forest.

01_ Foothills and coastal range beyond

02_ Foothills and coastal range beyond

02____Landscape character summary

2.3.5_ Open woodlands

Open woodland is composed of cleared or partially cleared lands and varies from scattered clumps/clusters of trees to continuous, but open woodland.

This distinctive landscape feature usually occurs within rural, rural residential and pasture development.

Along the highway, this landscape character offers travellers a sense of both enclosure and exposure. Open woodland also acts as a transitional zone between densely forested sections and floodplain, giving a way point to travellers of a changing landscape character.

01_ Open woodland, viewed along Wooli Road, Sandy Crossing

02_ Open woodland pasture

2.3.6_ Forest

Forest reflects a relatively undisturbed landscape composed of groundcovers, understory and canopy of vegetation, creating a strong sense of enclosure.

The landscape character unique to forested areas usually occurs in national parks, state forests, conservation areas, and nature reserves which are a dominant feature of the study area.

The enclosed nature of the forested areas gives a distinctive landscape character, and reinforces a constant theme of the highway in distinct areas from Woolgoolga to Ballina; forests are divided by floodplains with crop and pasture lands, river crossings, and small towns.

The nature of enclosed forested sections throughout the study area reinforces the presence of the mountains through view lines, the occasional glimpses of the ocean, small settlements and interspersed farmsteads along the highway.

01_ The existing Pacific Highway through Glenugie State Forest

02_ Halfway Creek duplication

02____Landscape character summary

2.3.7_ Littoral scrub

Littoral scrub is a distinctive landscape characteristic adjacent to water. The characteristics of this landscape are usually dominated by dense coastal Banksia scrub, pockets of wetland forest, and dense dry heath.

Littoral landscapes are predominately located within the northern zone of the study area. This dominant landscape feature is seen around the urban settlement of Broadwater, between the Richmond River and the Pacific Ocean, within the Broadwater National Park.

Although named the Pacific Highway, the highway at this location is characterised more by the mountains and rivers of the Great Dividing Range than by the coast and Pacific Ocean. This reinforces the importance of this landscape character within the study area as a reference to the proximity of the nearby Pacific Ocean.

01_ Broadwater National Park

02_ Bingal Creek dense banksia heath

2.3.8_ Ranges and hill tops

Ranges and hill tops are one of the common landscape character zones and are concentrated to the eastern edge of the study area south of the Clarence River, and to the western edge of the highway north of the Clarence River.

Ranges are characterised by steep gradients (15 per cent or greater) and a relatively high elevation. The steep topography of this terrain has seen the natural vegetation communities largely retained, usually in national parks, state forests, nature reserves, and conservation areas.

The vision for the Pacific Highway notes a 'green highway providing panoramic views to the Great Dividing Range'. Within this region there are some significant terrain elevations notably: Mount Elaine (316 m) near Glenugie, Pillar Rock (200 m) near Pillar Valley, McCraes Knob (260 m) near Tucabia, and Mount Double Duke (220 m) and The Devils Pulpit (220 m) within Bundjalung conservation area.

01_ Sugarcane fields north of Tyndale, with Shark Creek Range and Mount Clarence in background

02_ Intersection of Pacific Highway and Coldstream Road, with Bondi Hill in background

02____Landscape character summary

2.3.9_ Waterways

There are several significant waterways that define the landscape character within the study area, including rivers, creeks, swamps and canals.

There are a number of the key natural landmarks along the Pacific Highway noted within the *Pacific Highway Urban Design Framework* (RTA, 2005). Two of these natural landmarks fall within the study area: the Clarence and Richmond river crossings.

The two waterways add to constant and repeating patterns that occur within the landscape; namely the interplay of rolling hills, floodplains, forests, small towns, and river crossings.

01_ Richmond River

02_ Aerial view of ephemeral wetlands associated with the Coldstream River

2.3.10_ Urban settlement

Urban settlement within the study area can be loosely divided within three typical characters: rural and semi rural; rural residential; and townships.

Main townships within the study area include Corindi Beach, Tucabia, Tyndale, Gulmarrad, Maclean, Townsend, Harwood, Woodburn, Broadwater, and Wardell.

Other settlements of note include Arrawarra, Dirty Creek, Halfway Creek, Wells Crossing, Glenugie, Sandy Crossing, Pillar Valley, Chatsworth, James Creek, Jacky Bulbin Flat, Tabbimoble, New Italy, Trustums Hill, and Coolgardie.

Settlements contribute to the repeating patterns that occur within the landscape; namely the interplay of rolling hills, plains, forests, small towns, and river crossings.

01_ Aerial view of Harwood and the Clarence River floodplain, highlighting the rural township settlement patterns within the study area.

02_ Main street of Maclean

02____Landscape character assessment

2.4_ Sections and character precincts

The eleven sections identified for the project by the RMS (refer table 01 and figure 01) are also used as a convenient way to package the project into manageable areas for landscape character assessment.

A total of 54 landscape character precincts are identified over the entire project. For each character precinct an assessment has been made about its ability to visually absorb change based on its landscape character in accordance with the visual impact grading matrix (refer Table 03). Generally a pristine environment would have a lower absorption capacity than a highly modified landscape. Other factors that affect absorption capacity include the complexity of the landscape, patterns within the landscape (crops, plantations), structure and openness. Irregular patterns with complexity have a better absorption capacity. Character precincts are listed below from south to north in accordance with the 11 indicative project sections which are likely to be the basis for future staging of delivery.

Section 1_ Woolgoolga to Halfway Creek
01_ Arrawarra Headland and Corindi Beach
02_ Wedding Bells State Forest and Garby Nature Reserve
03_ Blackadder Gully
04_ Dirty Creek Forest
05_ Dirty Creek blueberry farm
06_ Halfway Creek Forest

Section 2_ Halfway Creek to Glenugie upgrade
07_ Halfway Creek
08_ Glenugie State Forest

Section 3_ Glenugie upgrade to Tyndale
08_ Glenugie State Forest
09_ Glenugie pasture
10_ Grafton Airport/Pheasant Creek
11_ Coldstream River/Sandy Crossing
12_ Pillar Valley
13_ Coldstream River Swamplands
14_ Tucabia township
15_ Upper Coldstream
16_ Pine Brush State Forest
17_ South Arm floodplain
18_ Tyndale township
19_ Bondi Hill

Section 4_ Tyndale to Maclean
17_ South Arm floodplain
18_ Tyndale township
19_ Bondi Hill
20_ Woodford Island
21_ Shark Creek
22_ Green Hill
23_ Gulmarrad township
24_ Maclean/Townsend township
25_ Maclean Pinnacle

Section 5_ Maclean to Iluka Road, Mororo
25_ Maclean Pinnacle
26_ Yaegl Nature Reserve
27_ Clarence River floodplain
28_ Ashby
29_ Harwood township
30_ Chatsworth Hill
31_ Mororo Creek Valley

Section 6_ Iluka Road to Devils Pulpit
31_ Mororo Creek Valley
32_ Bundjalung National Park
33_ Jacky Bulbin Flat

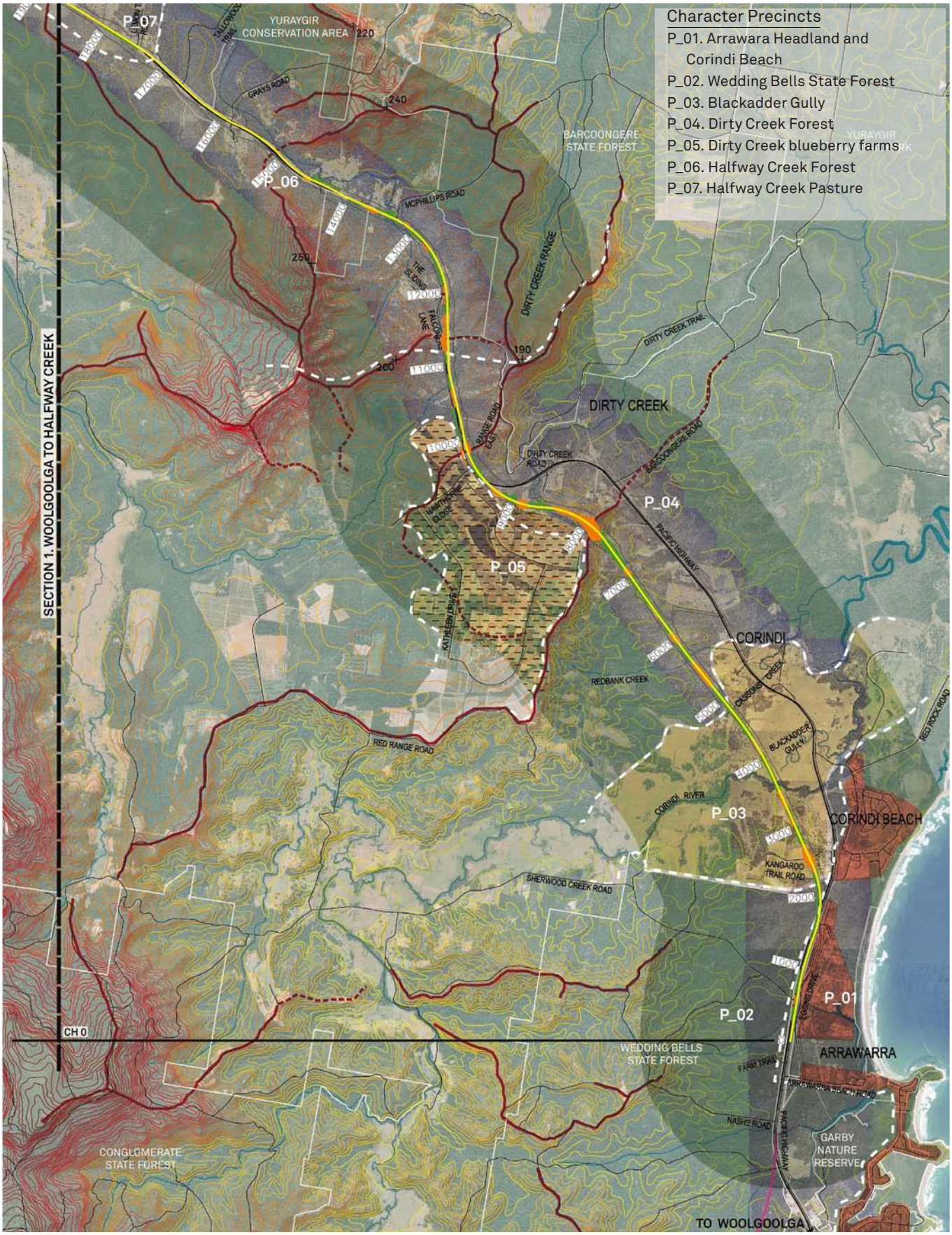
Section 7_ Devils Pulpit upgrade to Trustums Hill
32_ Bundjalung National Park
33_ Jacky Bulbin Flat
34_ Tabbimoble floodways
35_ Tabbimoble State Forest
36_ Tabbimoble Swamp Nature Reserve
37_ New Italy
38_ Rocky Mouth Creek and floodplain
39_ Trustums Hill

Section 8_ Trustums Hill to Broadwater National Park
40_ Tuckombil Canal
41_ East Woodburn
42_ Woodburn township
43_ Broadwater National Park and surrounds
44_ South Richmond River, floodplain & Langs Hill Water Reserve

Section 9_ Broadwater National Park to Richmond River
45_ East Broadwater & Cooks Hill
46_ Broadwater township
47_ Tuckean Broadwater

Section 10_ Richmond River to Coolgardie Road
47_ Tuckean Broadwater
48_ Cabbage Tree Island and floodplain
49_ Baggotville floodplain & Lumleys Hill
50_ Bingal Creek
51_ Wardell township
52_ Blackwell Range

Section 11_ Coolgardie Road to Ballina bypass
52_ Blackwell Range
53_ Pimlico
54_ Emigrant Creek



CP 01

Legend

- Alignment and boundary with chainages
- Areas of cut
- Areas of fill
- Existing Pacific Highway route
- Existing Pacific Highway Upgrade alignment
- Strong ridgelines
- Notional ridgelines
- Landscape precinct
- National Parks, State Forests, Nature Reserves, Conservation Areas
- Waterways
- Contours at 10m interval

Landscape Types

- Cleared land (pasture) Cultivated land (crops)
- Littoral scrub
- Floodplain
- Valley lands - foothills
- Open woodland
- Forest
- Ranges and hill tops
- Urban settlement

Landscape character assessment plan

02____Landscape character assessment

2.4.1_ Precinct 1: Arrawarra Headland and Corindi Beach
Section 1_ Woolgoolga to Halfway Creek
Landscape types: Urban settlement, forest
Ability to visually absorb change: High - due to heavily influenced and managed landscape.
Arrawarra Headland and Corindi Beach are located on the coastal plain between the project and the ocean. Corindi Beach is the largest settlement in the southern section of the study area with a population of 835, and while it is experiencing residential growth it remains visually separated from the existing highway alignment.

Topography
Coastal plain
Hydrology
Arrawarra Gully
Arrawarra Creek
Pipe Clay Lake

Ecology/Vegetation
Pastureland
Woodland
Residential landscaping
Land use
Primarily residential use, with two main caravan parks interspersed with forested reserves.

Settlement
Residential around Arrawarra and Corindi Beach
Caravan parks
Spatial qualities
Primarily suburban streets
Coastal beaches

2.4.2_ Precinct 2: Wedding Bells State Forest and Garby Nature Reserve
Section 1_ Woolgoolga to Halfway Creek
Landscape types: Forest
Ability to visually absorb change: Moderate - due to existing contiguous enclosed forest landscape..
The highway in this area is aligned in a long straight section (approximately two kilometres). It passes through Eucalypt woodland that transitions into Melaleuca forest/wetland in the vicinity of two caravan park/cabin developments which are located between the highway and the ocean.

Topography
Coastal plain
Hydrology
Arrawarra Gully catchment
Arrawarra Creek catchment
Corindi River catchment

Ecology/Vegetation
Eucalypt woodland
Melaleuca forest/wetland
Land use
Forest

Settlement
None apparent
Spatial qualities
Enclosed forest

02____Landscape character assessment

2.4.3_ Precinct 3: Blackadder Gully
Section 1_ Woolgoolga to Halfway Creek
Landscape types: Valley lands – foothills (pasture)
Ability to visually absorb change: Moderate - due to open low lying agricultural landscape.
North of Corindi Beach, the highway passes through the floodplain of the Corindi River, within which pastureland is the predominant land use. The small rural settlement of Corindi is located adjacent to both sides of the highway in this area. The highway then rises above this wetland area into a pastureland/woodland mosaic.

Topography
Coastal hinterland
Hydrology
Floodplain of the Corindi River

Ecology/Vegetation
Pastureland
Woodland
Land use
Pasture

Settlement
The small rural settlement of Corindi is located to the eastern side of the highway in this area.
Spatial qualities
Mixture of open and enclosed conditions relating to vegetation.

2.4.4_ Precinct 4: Dirty Creek Forest
Section 1_ Woolgoolga to Halfway Creek
Landscape types: Forest
Ability to visually absorb change: Moderate - due to existing contiguous enclosed forest landscape.
The highway enters a mainly forested landscape as it rises out of the Corindi River floodplain. The straightness of the highway allows some narrow longer distance views north to the Dirty Creek Range. At the end of this straight section, the highway rises more dramatically as it climbs the Dirty Creek Range.

Topography
Coastal hinterland
Dirty Creek Range
Hydrology
Redbank Creek catchment
Mullet Creek catchment
Corindi River catchment

Ecology/Vegetation
Tall Eucalypt forest
Pockets of open woodland
Land use
Forest
Pockets of agriculture

Settlement
Interspersed rural residential adjacent to current highway.
Spatial qualities
Enclosed forest
Pockets of open agricultural fields

2.4.5_ Precinct 5: Dirty Creek Blueberry Farm
Section 1_ Woolgoolga to Halfway Creek
Landscape types: Valley lands – foothills (crops)
Ability to visually absorb change: High - due to heavily influenced and managed landscape.
A blueberry farm complex west of current highway alignment, within a contained plateau along the Dirty Creek Range.

Topography
Dirty Creek plateau
Hydrology
Contained plateau
Agricultural dams
Dirty Creek catchment

Ecology/Vegetation
Agricultural fields
Sparse, drifts of tree cover
Agricultural dams
Land use
Blueberry farm

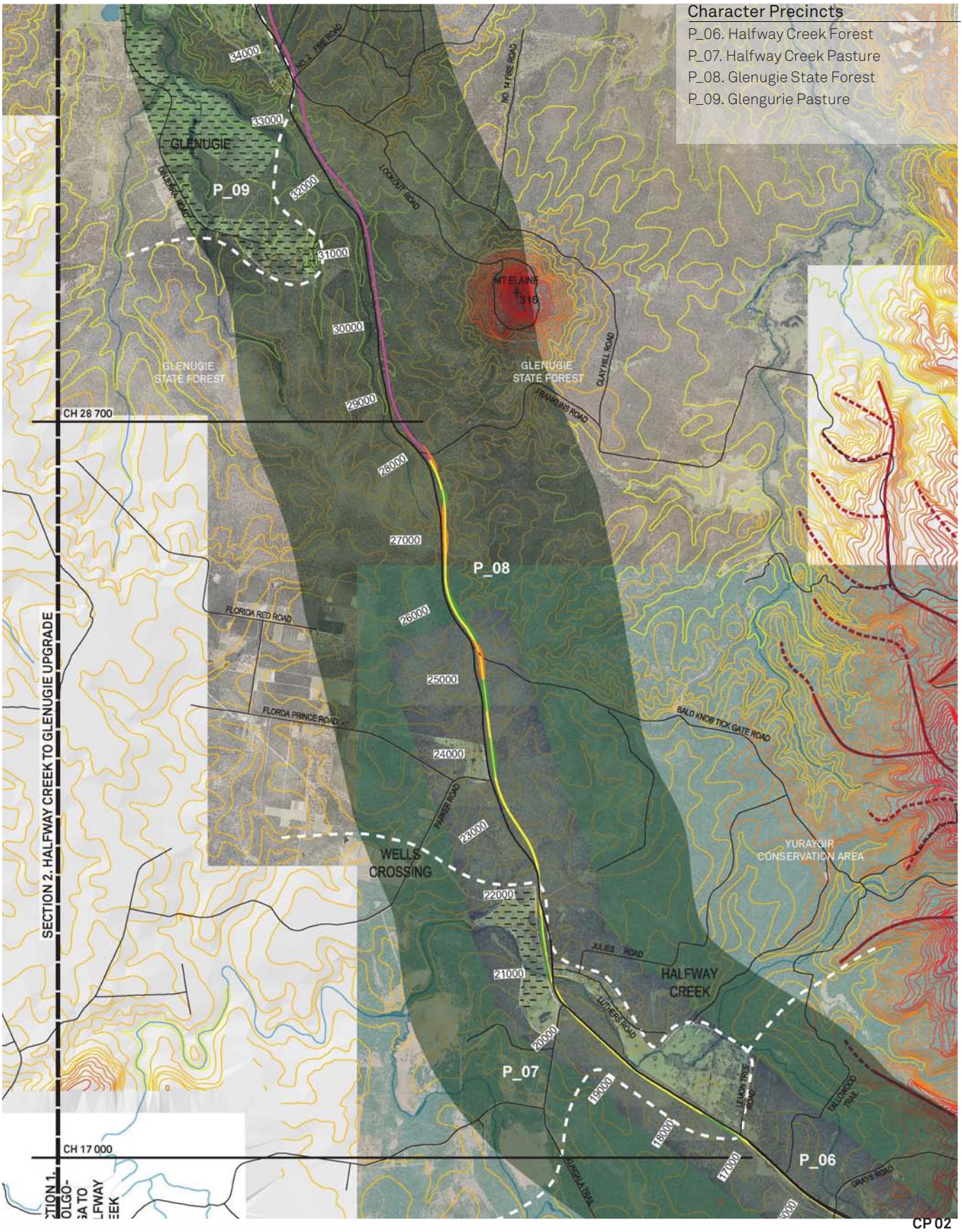
Settlement
Rural residential
Spatial qualities
Open agricultural fields with forested sections along edges.

2.4.6_ Precinct 6: Halfway Creek Forest
Section 1_ Woolgoolga to Halfway Creek
Landscape types: Forest
Ability to visually absorb change: Moderate - due to existing contiguous enclosed forest landscape.
Further steep and undulating forested country occurs along the highway as it traverses another ridge associated with the Dirty Creek Range, much of which is incorporated into the Yuraygir Conservation Area.

Topography
Dirty Creek Range
Hydrology
Halfway Creek catchment
Pigeon Gully catchment

Ecology/Vegetation
Tall Eucalypt forest
Land use
Forest
Pockets of pasture

Settlement
Pockets of rural residential south of Grays Road.
Spatial qualities
Enclosed forest with pockets of open woodland pasture.



CP 02

Legend

- Alignment and boundary with chainages
- Areas of cut
- Areas of fill
- Existing Pacific Highway route
- Existing Pacific Highway Upgrade alignment
- Strong ridgelines
- Notional ridgelines
- Landscape precinct
- National Parks, State Forests, Nature Reserves, Conservation Areas
- Waterways
- Contours at 10m interval

Landscape Types

- Cleared land (pasture) Cultivated land (crops)
- Littoral scrub
- Floodplain
- Valley lands - foothills
- Open woodland
- Forest
- Ranges and hill tops
- Urban settlement

Landscape character assessment plan

02____Landscape character assessment

2.4.7_ Precinct 7: Halfway Creek
Section 2_ Halfway Creek to Glenugie
Landscape types: Open woodland (pasture and crops), forest
Ability to visually absorb change: High - due to existing modified agricultural landscape.
This relatively flat and straight section of the highway is characterised by partially cleared pasture land with the view being relatively enclosed. This pattern of the highway running through an enclosed forested landscape continues through towards Wells Crossing.

Topography
Undulating within the small valley created by Halfway Creek.
Hydrology
Halfway Creek catchment

Ecology/Vegetation
Forest, with some partially cleared pastureland.
Land use
Open Woodland
Pockets of pasture

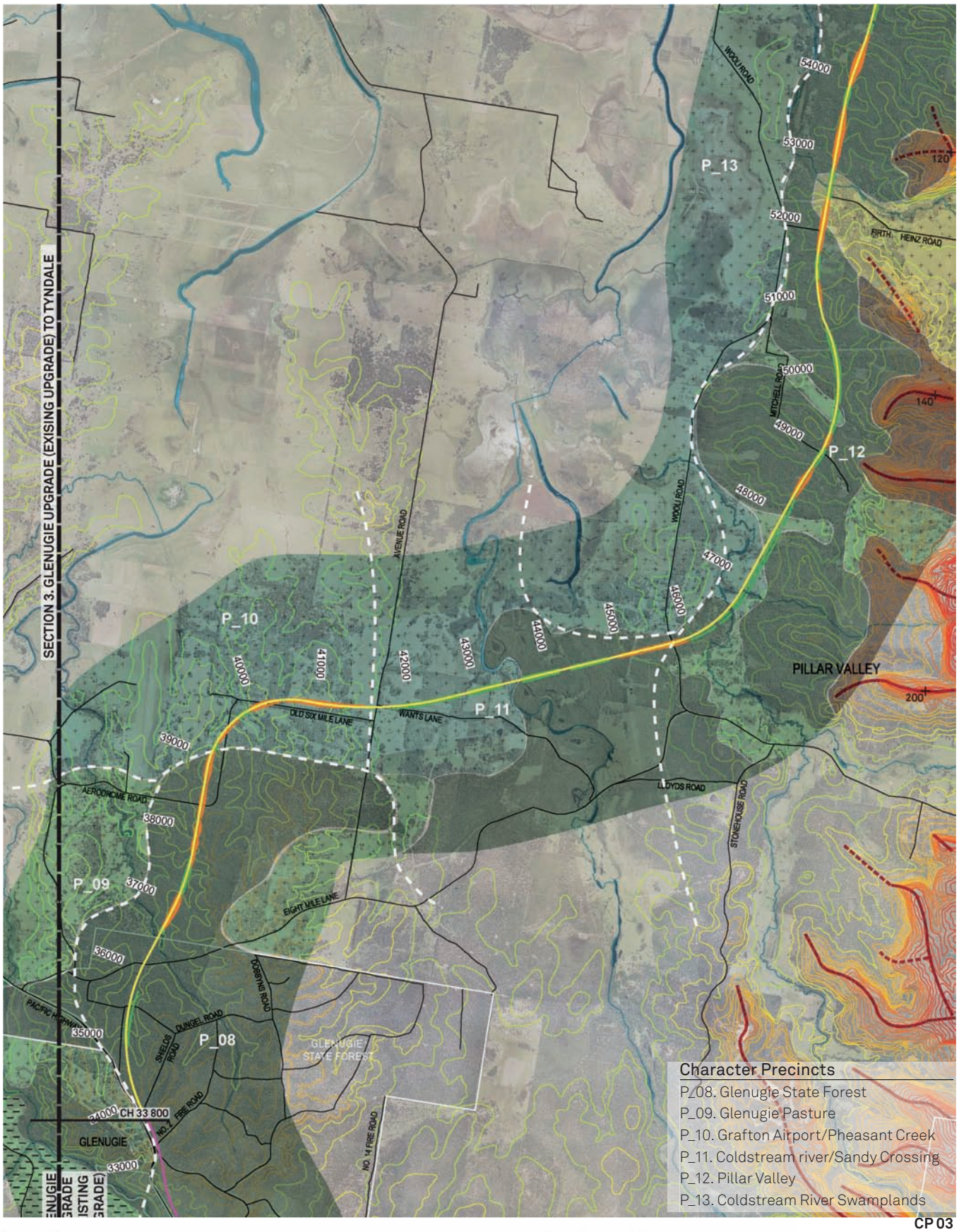
Settlement
Small collection of buildings (including the service station, motel and bush fire brigade shed) and the rest area at Halfway Creek.
Spatial qualities
Enclosed forest with pockets of open woodland pasture and small collection of buildings.

2.4.8_ Precinct 8: Glenugie State Forest
Section 2_ Halfway Creek to Glenugie, Section 3_ Glenugie to Tyndale
Landscape types: Forest
Ability to visually absorb change: Moderate - due to existing contiguous enclosed forest landscape.
The landscape type within this precinct is undulating, with transitional areas between the ridges and plains of the region, consisting of rolling hills of gentle gradient. The forest is composed of ground cover, under storey and canopy vegetation, creating a strong sense of enclosure.

Topography
Undulating
Hydrology
Halfway Creek catchment
Glenugie Creek catchment

Ecology/Vegetation
Tall eucalypt forest
Mixed floodplain forest
Land use
Forest
Pockets of pasture; beef and dairy farms

Settlement
Sparsely populated rural area
Spatial qualities
Enclosed forest with pockets of open woodland pasture .



CP 03

Legend

- Alignment and boundary with chainages
- Areas of cut
- Areas of fill
- Existing Pacific Highway route
- Existing Pacific Highway Upgrade alignment
- Strong ridgelines
- Notional ridgelines
- Landscape precinct
- National Parks, State Forests, Nature Reserves, Conservation Areas
- Waterways
- Contours at 10m interval

Landscape Types

- Cleared land (pasture) Cultivated land (crops)
- Littoral scrub
- Floodplain
- Valley lands - foothills
- Open woodland
- Forest
- Ranges and hill tops
- Urban settlement

Landscape character assessment plan

2.4.9_ Precinct 9: Glenugie pasture
Section 3_ Glenugie to Tyndale
Landscape types: Forest, open woodland (pasture)
Ability to visually absorb change: Moderate **- due to existing modified agricultural landscape.**
This precinct lies to the east of the highway, and is primarily characterised by partially cleared pasture and agricultural land. Dinjerra Road acts as a focal point for the precinct south of the existing Pacific Highway, whilst a large rural farm occupies the precinct north of the highway.

Topography
Undulating
Hydrology
Sawpit Creek catchment
Poison Creek catchment
Lake Arthur
Glenugie Creek catchment
Bom Bom Creek catchment

Ecology/Vegetation
Agricultural fields
Pasture land
Agricultural dams
Open woodland
Land use
Agriculture
Pasture
Settlement
Rural, rural residential

Spatial qualities
Open woodland, interspersed with agricultural fields, contained within forested sections.

2.4.10_ Precinct 10: Grafton Airport/Pheasant Creek
Section 3_ Glenugie to Tyndale
Landscape types: Floodplain (pasture)
Ability to visually absorb change: Moderate - due to existing modified agricultural landscape.
The precinct is defined by the cleared airstrip of Grafton Airport as a focal point, within a wetland and open woodland setting.

Topography
Slightly undulating
Hydrology
Glenugie Creek catchment
Pheasant Creek catchment

Ecology/Vegetation
Open woodland, with some partially cleared pastureland
Glenugie Creek wetland
Land use
Pockets of pasture
Airport

Settlement
Rural residential
Small collection of buildings including houses, hangar, and associated airport infrastructure at Grafton Airport
Spatial qualities
Open within airfield, with semi-enclosed woodland edges.

02____Landscape character assessment

2.4.11_ Precinct 11: Lower Coldstream/Sandy Crossing
Section 3_ Glenugie to Tyndale
Landscape types: Forest, open woodland (pasture), floodplain (pasture)
Ability to visually absorb change: Moderate – low - due to existing modified agricultural landscape.
This precinct sees the highway pass along the foothills of a spur, covered by a mix of open woodland and cleared pasture, before cutting across and entering the Clarence River flood plain where it crosses the lower Coldstream River.

Topography
Slightly undulating
Hydrology
Coldstream River catchment

Ecology/Vegetation
Open woodland
Mixed floodplain forest
Land use
Pockets of pasture
Agricultural holdings

Settlement
Mix of rural holdings
Spatial qualities
Enclosed within open woodland with pockets of open wetland.

2.4.12_Precinct 12: Pillar Valley
Section 3_ Glenugie to Tyndale
Landscape types: Floodplain, valley lands – foothills, and open woodland (pasture), forest, ranges and hill tops
Ability to visually absorb change: Moderate - due to existing modified agricultural landscape.
Within this precinct, the highway enters the Pillar Valley region, before entering the foothills of the Pillar Range. The topography of these foothills can accommodate the road formation and have a varied vegetation cover that allows views to be restricted or revealed.

Topography
Undulating within the Pillar Valley
Hydrology
Pillar Valley Creek catchment
Horseshoe waterhole
Chaffin Creek catchment

Ecology/Vegetation
Open woodland valleys with forested foothills
Land use
Open woodland
Strips of pasture within valleys

Settlement
Rural, rural residential
Spatial qualities
Mixture of enclosed forested sections with open views throughout valley lands.

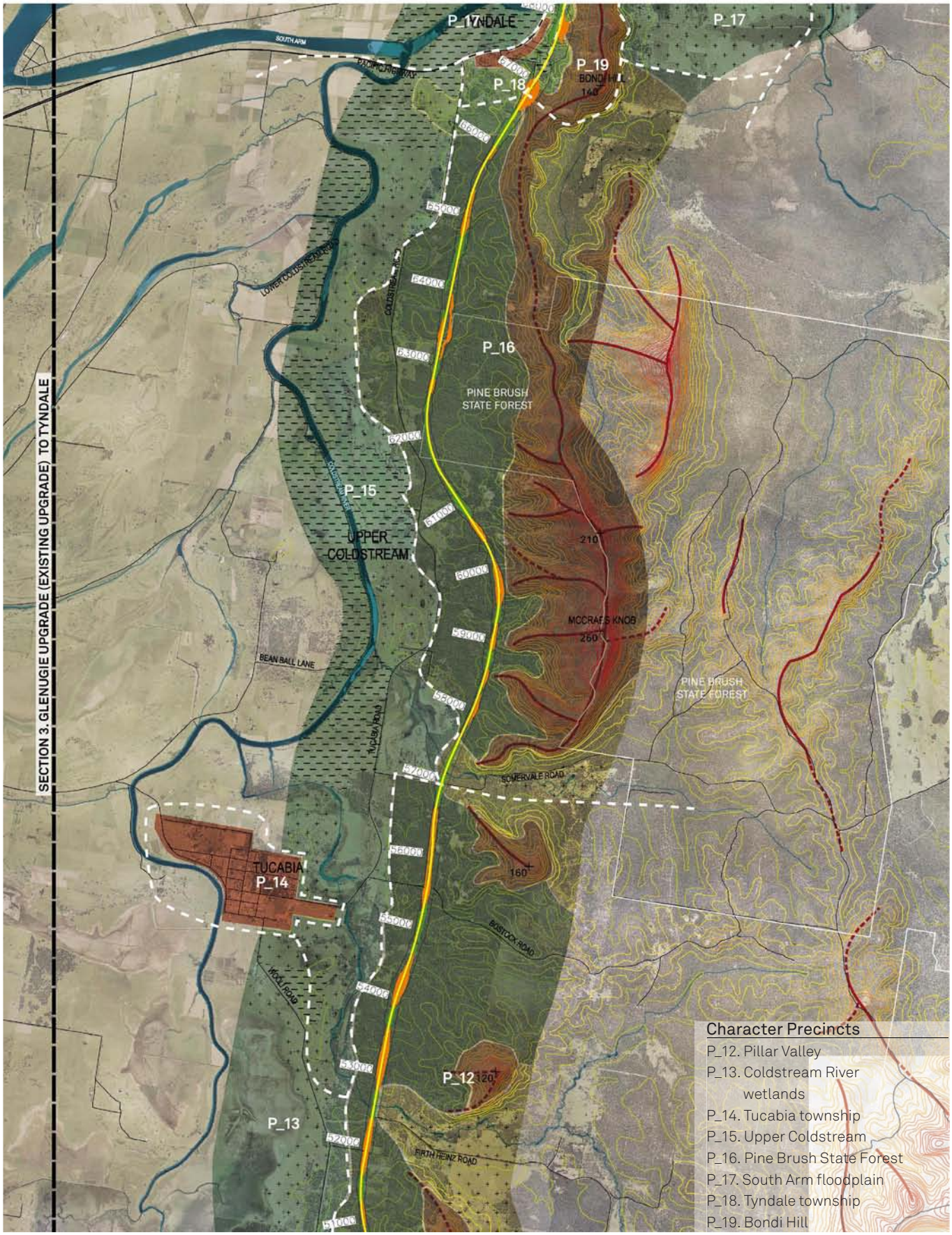
02____Landscape character assessment

2.4.13_ Precinct 13: Coldstream River swamplands
Section 3_ Glenugie to Tyndale
Landscape types: Floodplain (pasture)
Ability to visually absorb change: Low - due to existing ephemeral floodplain landscape.
The precinct is defined by the ephemeral swamplands of the lower Coldstream River, offering a unique landscape character within the study area.

Topography
Floodplain
Hydrology
Pillar Valley Creek catchment
Coldstream River catchment
Crowsnest Swamp
Walsh's Hole

Ecology/Vegetation
Mixed floodplain vegetation
Land use
Pasture
Small rural farm lots

Settlement
Sparsely populated rural area
Spatial qualities
Views within the flood plain are broad and only broken by scattered remnants of woodland.



CP 04

Legend

- Alignment and boundary with chainages
- Areas of cut
- Areas of fill
- Existing Pacific Highway route
- Existing Pacific Highway Upgrade alignment
- Strong ridgelines
- Notional ridgelines
- Landscape precinct
- National Parks, State Forests, Nature Reserves, Conservation Areas
- Waterways
- Contours at 10m interval

Landscape Types

- Cleared land (pasture)
- Cultivated land (crops)
- Littoral scrub
- Floodplain
- Valley lands - foothills
- Open woodland
- Forest
- Ranges and hill tops
- Urban settlement

Landscape character assessment plan

2.4.14_ Precinct 14: Tucabia township
Section 3_ Glenugie to Tyndale
Landscape types: Urban settlement (pasture)
Ability to visually absorb change: High - due to heavily influenced and managed landscape.
Tucabia is approximately halfway between Tyndale and Pillar Valley, and is a noted stop for travellers using an alternate route from the Pacific Highway. The rural village of Tucabia has a more subtle charm than larger township precincts, which adds visual variety to the setting of the study area.

Topography
Slight saddle between the Coldstream River and Chaffin Creek, within the surrounding flat floodplain
Hydrology
Coldstream River catchment
Chaffin Creek catchment

Ecology/Vegetation
Residential gardens within an overall open woodland setting
Land use
The Squatters Rest Museum
Shops
Public school
Thorley Sawmill

Settlement
Large residential blocks
Small township population
Spatial qualities
Open rural township with slight elevation overlooking the surrounding floodplain.

2.4.15_ Precinct 15: Upper Coldstream
Section 3_ Glenugie to Tyndale
Landscape types: Floodplain (pasture and crops), valley lands – foothills
Ability to visually absorb change: Low - due to existing ephemeral floodplain landscape.
The precinct is defined by the catchment of the upper Coldstream River and the foothills of nearby ranges, offering a unique landscape character within the study area with well defined edge conditions.

Topography
Extensive floodplain and foothills of the Pillar Valley and Pine Brush State Forest ridges
Hydrology
Coldstream River catchment
Chaffin Creek catchment
Champions Creek catchment
Macphees Swamp

Ecology/Vegetation
Mixed floodplain vegetation
Open woodland
Land use
Agriculture
Pasture land within less fertile soils

Settlement
Mix of rural holdings
Spatial qualities
Views within the flood plain are broad and only broken by scattered remnants of woodland.

02____Landscape character assessment

2.4.16_ Precinct 16: Pine Brush State Forest
Section 3_ Glenugie to Tyndale
Landscape types: Valley lands – foothills (pasture), forest, ranges and hill tops
Ability to visually absorb change: Moderate - due to undulating topography and existing enclosed forest landscape.
Within this precinct, the project enters the ranges associated with the Pine Brush State Forest. The topography of these foothills can accommodate the road formation and have a varied vegetation cover that allows views to be restricted or revealed.

Topography
Undulating with minor creek crossings and minor ridgelines
Shark Creek valley
Hydrology
Coldstream River catchment
Champions Creek catchment
South Arm catchment
Shark Creek catchment

Ecology/Vegetation
Tall eucalypt forest
Mixed floodplain forest
Land use
Sparsely populated rural area
Pockets of pasture

Settlement
Rural
Spatial qualities
Mixture of enclosed forested sections with open views throughout foothills.
Enclosed forest with pockets of open woodland pasture and small collection of buildings.

2.4.17_ Precinct 17: South Arm floodplain
Section 3_ Glenugie to Tyndale, Section 4_ Tyndale to Maclean
Landscape types: Floodplain (pasture and crops), open woodland (pasture)
Ability to visually absorb change: Low – moderate - due to existing open low lying agricultural landscape.
The Clarence River South Arm floodplain dominates the precinct. The uniform landscape of extensive sugarcane plantations sets off the river and its immediate surrounds. The slight rolls of the floodplain highlight the surrounding topography and the focal point of the South Arm.

Topography
South Arm floodplain with flat to moderate foothills and valley edges
Hydrology
South Arm catchment
Elbow Creek catchment
Camp Creek catchment

Ecology/Vegetation
Mixed floodplain vegetation
Scattered woodland in flats
Sugarcane on gentle slopes
Land use
Cattle grazing
Sugarcane plantations

Settlement
Small rural residential developments
Scattered rural farm housing and associated structures
Spatial qualities
Alternating open and closed views along the highway according to crop rotation, with backdrop of forested hills to the west.

02____Landscape character assessment

2.4.18_ Precinct 18: Tyndale township
Section 3_ Glenugie to Tyndale
Landscape types: Urban settlement, Open woodlands
Ability to visually absorb change: Moderate - due to open low lying agricultural landscape.
Tyndale is a small village nestled between the foothills of Bondi Hill and the floodplain of the South Arm. Tyndale precinct provides the first north bound view of the green fields of sugar cane plantations.

Topography
Rolling terrain associated with Bondi Hill and the flatness of the South Arm floodplain.
Hydrology
South Arm catchment

Ecology/Vegetation
Residential gardens within an overall open woodland setting associated with Bondi Hill.
Land use
Motel, caravan park and bed and breakfast

Settlement
Large residential blocks
Small township population
Spatial qualities
Generally open with views across the cane farms and the river to Woodford Island.

Google, Digital Globe, 2012

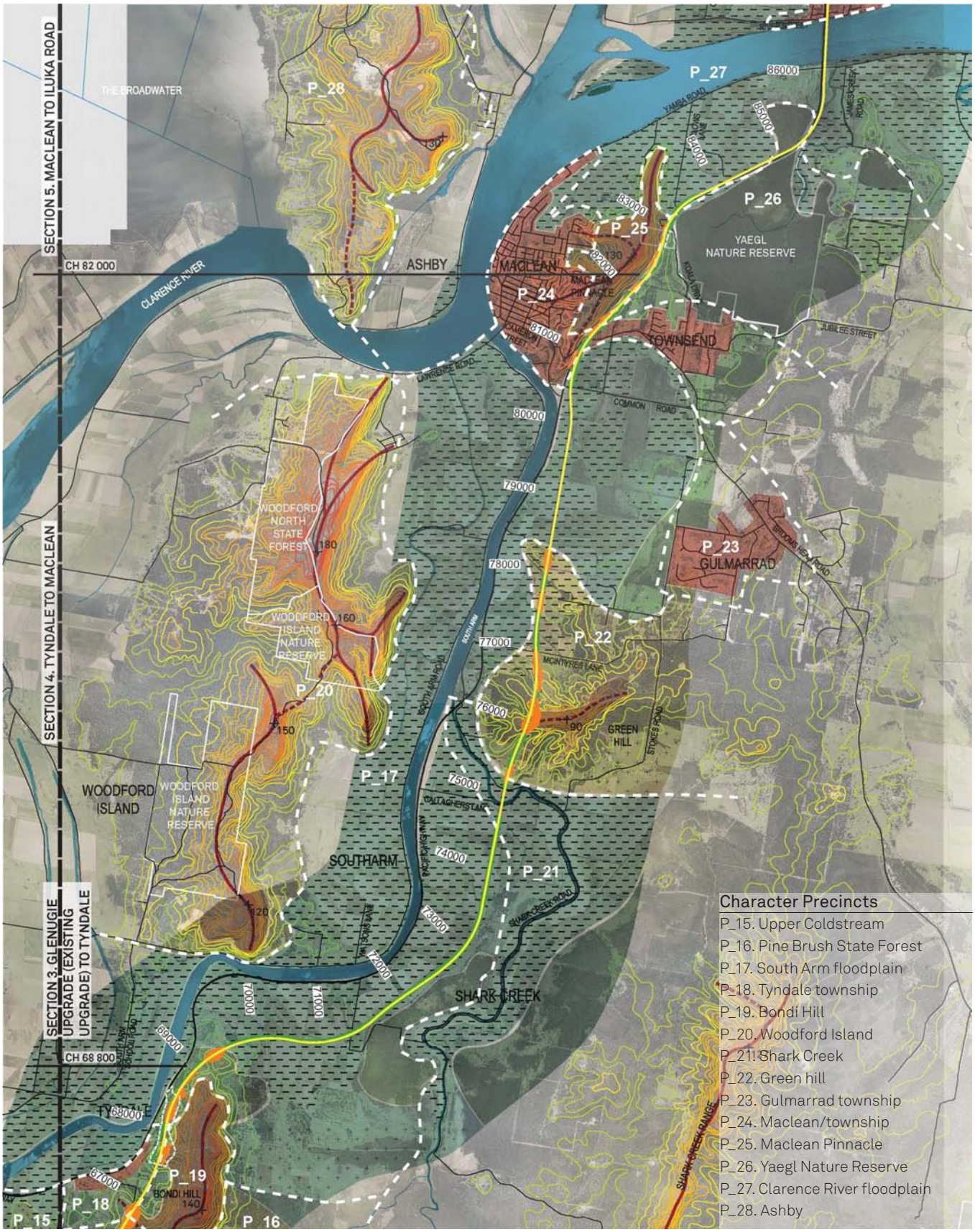
2.4.19_ Precinct 19: Bondi Hill
Section 3_ Glenugie to Tyndale
Landscape types: Forest, ranges and hill tops
Ability to visually absorb change: Low – moderate - due to undulating landform and enclosed landscape character.
The form and elevation of Bondi Hill make it a natural landmark. It rises from the floodplain landscape, in close proximity to the South Arm extension of the Clarence River. The existing Pacific Highway passes through a narrow corridor between the hill and the river, providing a memorable and attractive journey experience.

Topography
Steep to gentle rolling slopes of Bondi Hill
Hydrology
South Arm catchment

Ecology/Vegetation
Dense native forest
Open woodland at lower slopes closer to river
Land use
Woodland

Settlement
Undeveloped
Spatial qualities
There are extensive views of the South Arm floodplain, and the undulating topography creates an impression that this precinct is separated from other precincts by ridges and the river valley.

Google, Digital Globe, 2010



CP 05

Legend

- Alignment and boundary with chainages
- Areas of cut
- Areas of fill
- Existing Pacific Highway route
- Existing Pacific Highway Upgrade alignment
- Strong ridgelines
- Notional ridgelines
- Landscape precinct
- National Parks, State Forests, Nature Reserves, Conservation Areas
- Waterways
- Contours at 10m interval

Landscape Types

- Cleared land (pasture) Cultivated land (crops)
- Littoral scrub
- Floodplain
- Valley lands - foothills
- Open woodland
- Forest
- Ranges and hill tops
- Urban settlement

Landscape character assessment plan

02____Landscape character assessment

2.4.20_ Precinct 20: Woodford Island
Section 4_ Tyndale to Maclean
Landscape types: Forest, ranges and hill tops
Ability to visually absorb change: Moderate - due to undulating landform and enclosed forest landscape.
Woodford Island is defined by a range running through the centre of the largest non- delta river island in the southern hemisphere. It includes the Woodford Island Nature Reserve and the Woodford North State Forest. The size, form and elevation of Woodford Island makes it a striking natural landmark within the Clarence River floodplain.

Topography
Rolling mountain range throughout the centre of the island dominates
Hydrology
South Arm catchment
Clarence River catchment
Running Creek catchment

Ecology/Vegetation
Primarily shrubby dry sclerophyll forest
Land use
Forestry
Quarrying
Recreation
Communications
Agriculture

Settlement
Largely undeveloped
Rural residential housing
Spatial qualities
The undulating topography creates an impression that this precinct is separated from other precincts by ridges and the river valley.

2.4.21_ Precinct 21: Shark Creek
Section 4_ Tyndale to Maclean
Landscape types: Floodplain (pasture and crops)
Ability to visually absorb change: Low – moderate - due to existing ephemeral floodplain landscape.
Shark Creek precinct is defined by the Shark Creek valley and floodplain. A slight open woodland saddle separates Shark Creek from the South Arm floodplain for much of the length within the study area, and the precinct has a sense of enclosure for much of its length.

Topography
Shark Creek Ranges flow into the Shark Creek valley and floodplain before meeting the South Arm of the Clarence River.
Hydrology
Shark Creek catchment
Shark Swamp

Ecology/Vegetation
Mixed floodplain vegetation
Scattered woodland in flats
Sugarcane on gentle slopes
Land use
Agriculture – Cane fields
Pockets of pasture

Settlement
Scattered rural farm housing and associated structures.
Spatial qualities
Alternating cycle of open and closed views along the highway according to crop rotation, with backdrop of forested hills to the east and west.

02____Landscape character assessment

2.4.22_ Precinct 22: Green Hill
Section 4_ Tyndale to Maclean
Landscape types: Forest, ranges and hill tops
Ability to visually absorb change: Moderate - due to undulating landform and extensive woodland landscape.
Green Hill precinct is defined largely by an open woodland saddle within the South Arm floodplain, creating a pinch point within the floodplain, opposite Woodford Island. The precinct defines the edge of Shark Creek Valley and the township of Gulmarrad. The form and elevation of Green Hill makes it a natural landmark.

Topography
Moderate to gentle rolling slopes of Green Hill and associated foothills.
Hydrology
South Arm catchment
Shark Creek catchment

Ecology/Vegetation
Dense native forest
Open woodland at lower slopes closer to floodplain
Land use
Woodland
Agriculture
Pockets of pasture

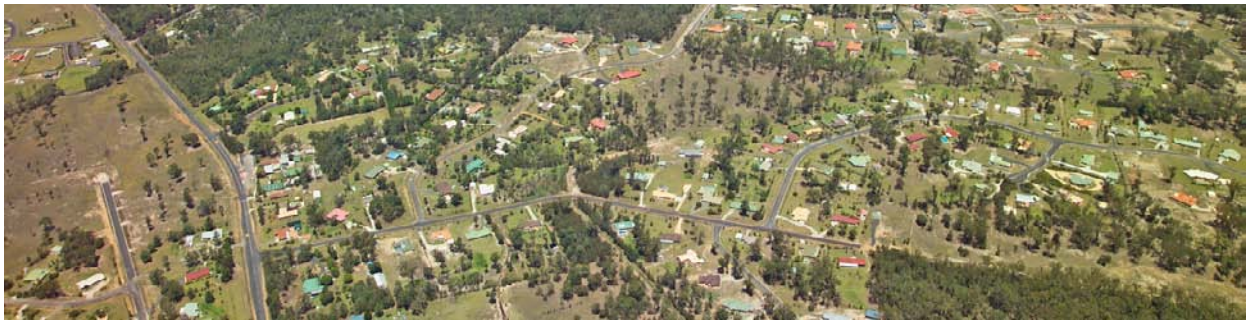
Settlement
Rural residential
Spatial qualities
The woodland covered saddle defines the edge of Shark Creek Valley and the township of Gulmarrad within the South Arm floodplain.

2.4.23_ Precinct 23: Gulmarrad township
Section 4_ Tyndale to Maclean
Landscape types: Urban settlement, open woodland (pasture)
Ability to visually absorb change: High - due to heavily influenced and managed landscape.
Gulmarrad is a small township located between the foothills of Green Hill and the South Arm floodplain. This part of the study area is characterised by cleared pasture lands and rural residential development in the vicinity of Gulmarrad.

Topography
Rolling terrain associated with Green Hill and the flatness of the South Arm floodplain.
Hydrology
South Arm catchment
Wooloweyah Lagoon catchment

Ecology/Vegetation
Residential gardens within an overall open woodland setting which permeates the township.
Land use
Residential
Public school
Rural fire brigade

Settlement
Large residential lots
Rural residential
Spatial qualities
Generally enclosed within the woodland edges, with filtered views towards the South Arm floodplain.



2.4.24_ Precinct 24: Maclean/Townsend township
Section 4_ Tyndale to Maclean
Landscape types: Urban settlement, open woodland (pasture)
Ability to visually absorb change: High - due to heavily influenced and managed landscape.
The precinct of Maclean/Townsend lies between the Clarence River and snakes its way around Maclean Pinnacle to include the township of Townsend. Much of the township of Maclean is not visible from the highway.

Topography
Flat floodplain east of Clarence River
Older parts of the town are in low-lying areas while newer buildings are on higher, flatter ground away from the river edge.
Hydrology
Clarence River catchment

Ecology/Vegetation
Mature trees within existing woodland.
Residential gardens
Land use
Agriculture
Tourism
Industrial
Commercial, retail and schools

Settlement
Large township with slightly larger lot sizes in Townsend.
Spatial qualities
Strong sense of town 'edge' with transition from urban to rural land use and character.

2.4.25_ Precinct 25: Maclean Pinnacle
Section 4_ Tyndale to Maclean, Section 5_ Maclean to Iluka Road
Landscape types: Ranges and hill tops
Ability to visually absorb change: Moderate - due to existing undulating landform and enclosed forest landscape.
Maclean Pinnacle rises to a height of 128 metres above the Clarence River floodplain, bisecting the townships of Maclean and Townsend. The undulating topography creates an impression that this precinct is separated from other precincts by the river valley. The sequence of slopes adds richness to the travel experience.

Topography
Steep to gentle rolling slopes of Maclean Pinnacle
Hydrology
Clarence River catchment
James Creek catchment

Ecology/Vegetation
Dense native forest
Open woodland at lower slopes closer to floodplain
Land use
Lookout
Residential lots

Settlement
Generally undeveloped
Some residential lots within the western slopes
Spatial qualities
Extensive views of the Clarence River floodplain. The form and elevation of Maclean Pinnacle makes it a striking natural landmark.

02____Landscape character assessment

2.4.26_ Precinct 26: Yaegl Nature Reserve
Section 5_ Maclean to Iluka Road
Landscape types: Forest, open woodland (pasture and crops)
Ability to visually absorb change: Moderate - due to existing contiguous enclosed forest landscape.
Yaegl Nature Reserve is situated on the Lower Clarence floodplain. It primarily consists of an estuarine back swamp which forms a large proportion of the catchment of James Creek. The reserve protects a large and important wetland, commonly known as Farlows Swamp or the Maclean Wetlands.

Topography
Majority of the reserve is less than five metres above sea level. A small sand ridge approximately 10 hectares in size and 15 metres high, occurs in the south east.
Hydrology
James Creek catchment
Palmers Channel catchment

Ecology/Vegetation
Farlows Swamp or the Maclean Wetlands
Remnant of floodplain paperbark forest
Land use
Surrounding land uses include agriculture, rural residential and industrial development

Settlement
Some areas adjacent to the reserve have been or are being developed for residential and rural residential purposes.
Spatial qualities
Enclosed woodland nature reserve with the western edge featuring open rural residential developments.

2.4.27_ Precinct 27: Clarence River floodplain
Section 5_ Maclean to Iluka Road
Landscape types: Floodplain (crops)
Ability to visually absorb change: Low – moderate - due to existing ephemeral floodplain landscape.
The wide flood plain of the Clarence River is one of the most recognisable precincts of the entire study area. The vast floodplain of the Clarence River and associated river islands make up the uniform landscape of extensive sugarcane plantations, setting off the river and its immediate surrounds.

Topography
Primarily consist of Clarence River floodplains, including Chatsworth, Harwood, Warregah, Coolah, and Yungum River islands.
Hydrology
Clarence River catchment
Nyrang Creek catchment
Serpentine Channel

Ecology/Vegetation
Primarily sugarcane fields, with sparse pockets of open woodland along creek and channel lines
Land use
Agriculture – sugarcane
Industry
Tourism

Settlement
Small rural residential developments
Scattered rural farm housing and associated structures.
Spatial qualities
Alternating cycle of open and closed views along the highway according to crop rotation.

2.4.28_ Precinct 28: Ashby
Section 5_ Maclean to Iluka Road
Landscape types: Ranges and hill tops
Ability to visually absorb change: Moderate - due to undulating landform and enclosed forest landscape.
The precinct of Ashby is defined by the extensive rolling mountain range that defines the western edge of the Clarence River floodplains and is an extension of Woodford Island ranges.

Topography
Rolling mountain range throughout
Steep to moderate slopes
Valleylands
Hydrology
Mangrove Creek catchment
Back Channel catchment
Ashby Channel catchment
Shoal Gully catchment

Ecology/Vegetation
Dense forested ridgelines with dense woodland slopes and foothills
Fingers of vegetation reaching down the steep slopes to the floodplain
Land use
Forestry
Quarrying
Residential developments

Settlement
Largely undeveloped
Rural residential housing
Spatial qualities
The undulating topography creates an impression that this precinct is separated from other precincts by ridges and dissecting creeklines.

CP 06

Legend

- Alignment and boundary with chainages
- Areas of cut
- Areas of fill
- Existing Pacific Highway route
- Existing Pacific Highway Upgrade alignment
- Strong ridgelines
- Notional ridgelines
- Landscape precinct
- National Parks, State Forests, Nature Reserves, Conservation Areas
- Waterways
- Contours at 10m interval

Landscape Types

- Cleared land (pasture) Cultivated land (crops)
- Littoral scrub
- Floodplain
- Valley lands - foothills
- Open woodland
- Forest
- Ranges and hill tops
- Urban settlement

Landscape character assessment plan

02____Landscape character assessment

2.4.29_ Precinct 29: Harwood township
Section 5_ Maclean to Iluka Road
Landscape types: Urban settlement, floodplain (crops)
Ability to visually absorb change: Low – moderate - due to scenic Clarence River landscape.
The precinct is defined by the extent of the urban development of Harwood. The edges of the precinct are defined by a strong sense of township 'edge' with transition from urban to rural land use and character. The Clarence River crossing is also a dominant feature of the precinct, with the Harwood Bridge dominating the horizon. Thias are contains the Harwood Heritage Conservation area and other locally listed heritage itrems.

Topography
Flat floodplain
Hydrology
Clarence River catchment
Nyrang Creek catchment

Ecology/Vegetation
Residential front gardens
Cultural plantings and scattered clusters of mangroves.
Land use
Public School
Agriculture
Tourism
Industrial

Settlement
Small township
Industrial
Commercial and retail
Harwood Heritage Conservation area
Spatial qualities
Strong sense of town 'edge': sudden transition from urban to rural land use and character.

2.4.30_ Precinct 30: Chatsworth Hill
Section 5_ Maclean to Iluka Road
Landscape types: Ranges and hill tops
Ability to visually absorb change: Low - due to prominent landform and scenic agricultural and forested landscape.
The precinct of Chatsworth Hill is concerned with the extensive rolling mountain range that defines the western edge of the Clarence River floodplains and to the north, merges into the Mororo Creek Nature Reserve.

Topography
Rolling mountain range throughout with high point of Chatsworth Hill
Steep to moderate slopes
Valleylands
Hydrology
Mangrove Creek catchment
Back Channel catchment
Mororo Creek catchment

Ecology/Vegetation
Dense forested ridge tops with dense woodland slopes and foothills.
Fingers of vegetation reaching down the steep slopes to the floodplain.
Land use
Undeveloped
Pockets of Agriculture within Mororo Creek area.

Settlement
Largely undeveloped
Rural residential housing along Mororo Creek.
Spatial qualities
The undulating topography creates an impression that this precinct is separated from other precincts by ridges and dissecting creek lines.

02____Landscape character assessment

2.4.31_ Precinct 31: Mororo Creek Valley
Section 5_ Maclean to Iluka Road, Section 6_ Iluka Road to Devils Pulpit upgrade
Landscape types: Forest, valley lands – foothills (pasture and crops)
Ability to visually absorb change: Moderate - due to undulating landform and modified agricultural landscape.
Mororo Creek Valley is defined by a valley bowl of agricultural fields within an open woodland valley, marking a transition between the Clarence River floodplain and the long stretch of forested highway north. The character of rolling sugarcane and the backdrop of forested slopes offers a unique landscape character.

Topography
Low lying, relatively flat topography with slight undulations to the east
Hydrology
Mororo Creek catchment
Garrets Gully catchment

Ecology/Vegetation
Riverine vegetation defines the alignment of Mororo Creek in the open landscape beyond the sugarcane fields.
Land use
Agriculture
Pockets of pasture

Settlement
Rural residential farm lots
Spatial qualities
Views to the east are contained vegetation or rolling sugarcane; to the west the view is open, over low lying land textured with sugarcane fields, with the significant backdrop / landmark of Chatsworth Hill.

2.4.32_ Precinct 32: Bundjalung National Park
Section 6_ Iluka Road to Devils Pulpit upgrade, Section 7_ Devils Pulpit upgrade to Trustums Hill
Landscape types: Forest, ranges and hill tops
Ability to visually absorb change: Moderate - due to existing contiguous enclosed forest landscape.
Gently undulating forested land with creek crossings and minor ridge lines. Majority of the zone is densely forested with enclosed visual catchments. Views westward to Mount Doubleduke and Richmond Range are obscured by the forested vegetation. There are distant views to a mountain range in the north.

Topography
Undulating with creek crossings and minor ridge lines.
Hydrology
Tabbimoble Creek catchment

Ecology/Vegetation
Densely forested
Enclosed eucalypt forest
Land use
Undeveloped forest
National park

Settlement
Primarily undeveloped
Isolated rural properties
Spatial qualities
Predominately enclosed forested corridor, with some opportunities for long range views.

Google, Digital Globe, 2010

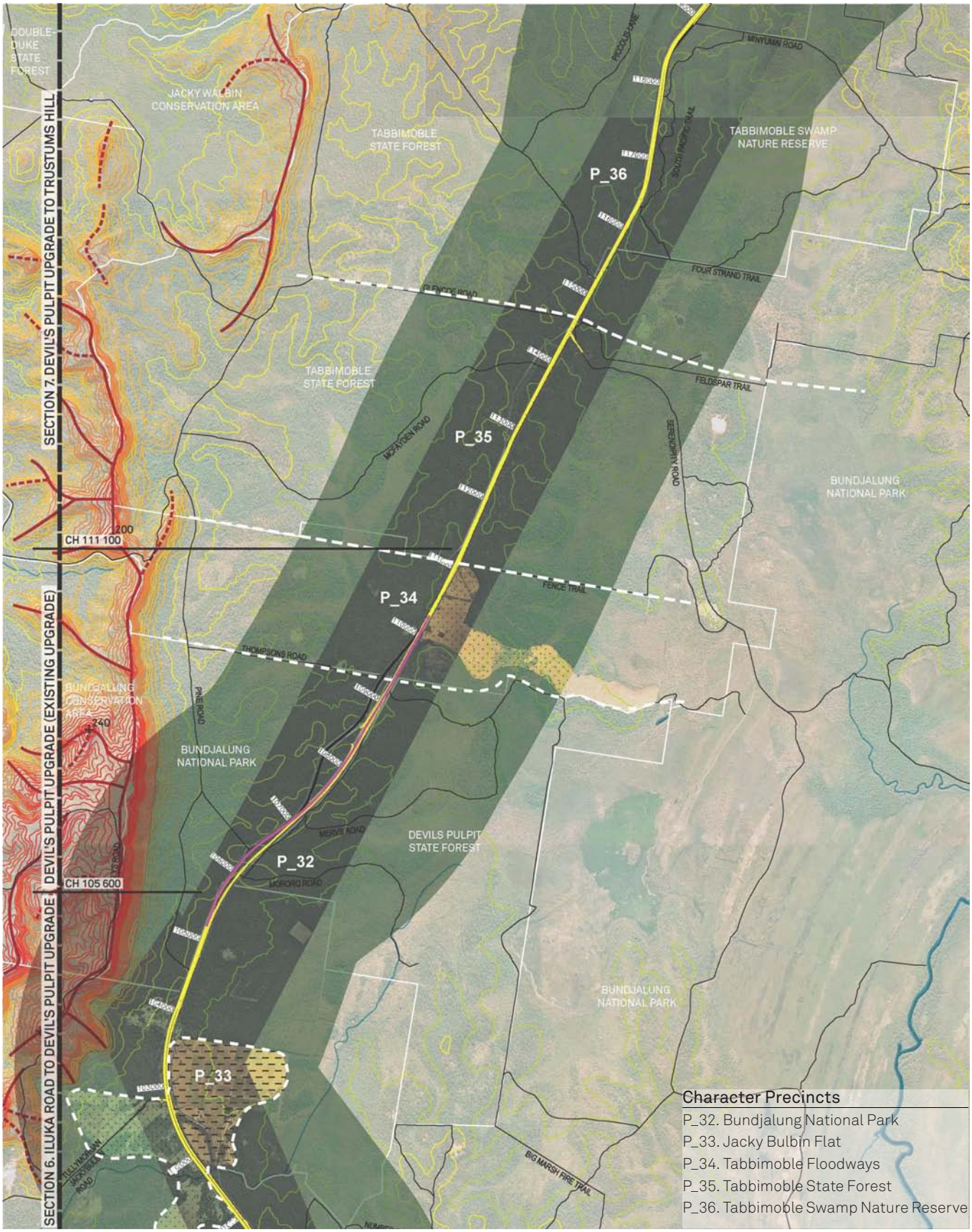
2.4.33_ Precinct 33: Jacky Bulbin Flat
Section 6_ Iluka Road to Devils Pulpit upgrade
Landscape types: Forest, valley lands - foothills, open woodland (pasture and crops)
Ability to visually absorb change: High - due to existing modified agricultural landscape.
The precinct is defined by a large pocket of agricultural and pasture land within the extensive forested section of the study area, offering travellers variety and change within the visual landscape. The precinct also offers opportunities for filtered distant mountain views within the open woodland vegetation.

Topography
Undulating
Hydrology
Tabbimoble Creek catchment

Ecology/Vegetation
Open woodland
Agricultural fields
Land use
Pastureland
Agricultural crops

Settlement
Scattered rural properties
Spatial qualities
Generally filtered views through open woodland with defined, dense forested edges.

Google, Digital Globe, 2010



CP 07

Legend

- Alignment and boundary with chainages
- Areas of cut
- Areas of fill
- Existing Pacific Highway route
- Existing Pacific Highway Upgrade alignment
- Strong ridgelines
- Notional ridgelines
- Landscape precinct
- National Parks, State Forests, Nature Reserves, Conservation Areas
- Waterways
- Contours at 10m interval

Landscape Types

- Cleared land (pasture) Cultivated land (crops)
- Littoral scrub
- Floodplain
- Valley lands - foothills
- Open woodland
- Forest
- Ranges and hill tops
- Urban settlement

Landscape character assessment plan

02____Landscape character assessment

2.4.34_ Precinct 34: Tabbimoble floodways
Section 7_ Devils Pulpit upgrade to Trustums Hill
Landscape types: Forest, valley lands – foothills (pasture and crops)
Ability to visually absorb change: Moderate - due to existing modified agricultural landscape.
The presence of the Tabbimoble Floodways offers the traveller a point of difference, with the repetition of floodway bridges providing a way finding opportunity.

Topography
Low lying floodplain area within a forested stretch of highway
Hydrology
Tabbimoble Floodways and catchments

Melaleuca dominant vegetation
Pockets of pasture land
Land use
Forested to the west
Pasture strip to the east

Settlement
Scattered rural properties to the west, and open rural pasture properties to the east.
Spatial qualities
Open to the east and enclosed through forested vegetation to the west.

Ecology/Vegetation

Google, Digital Globe, 2010

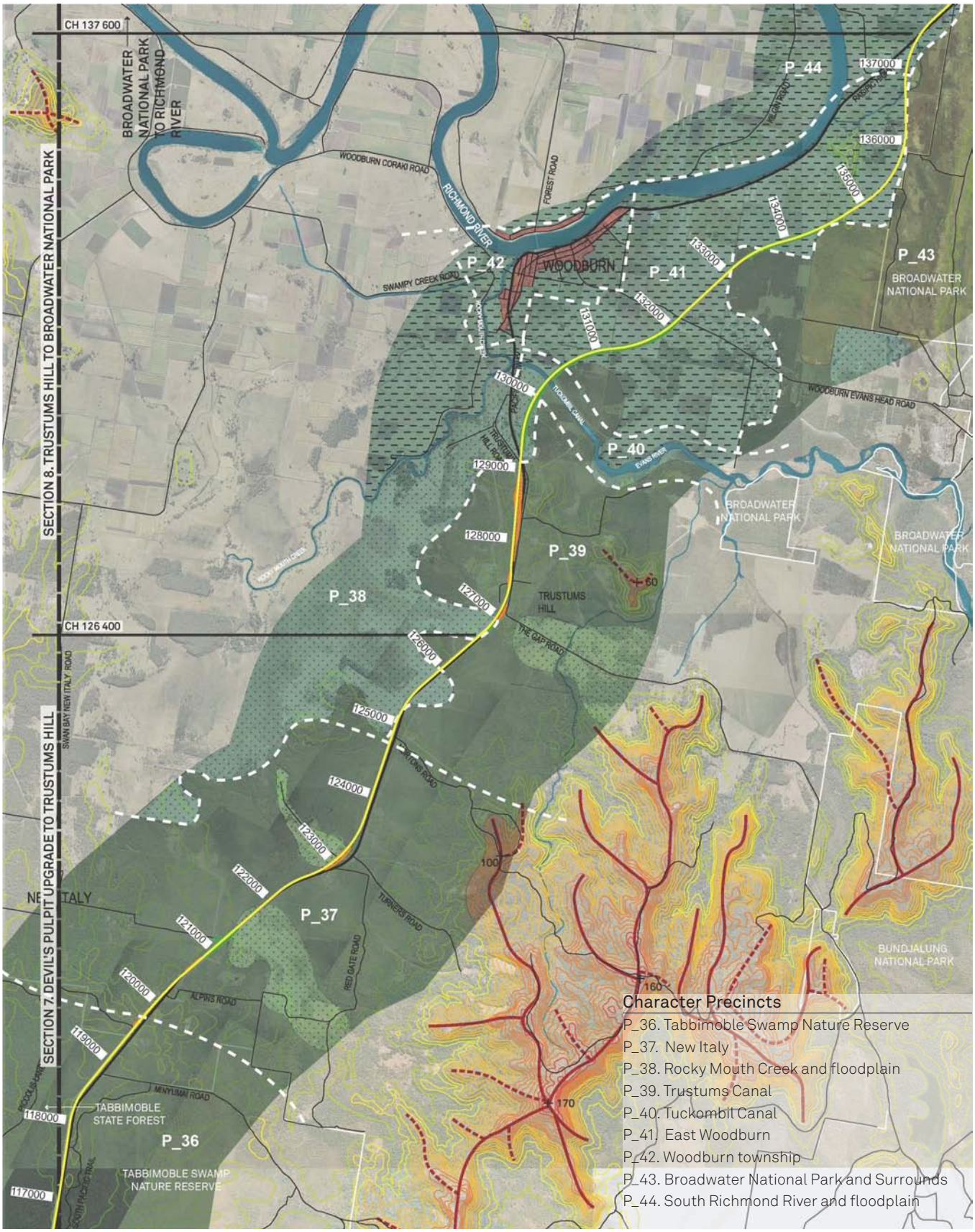
2.4.35_ Precinct 35: Tabbimoble State Forest
Section 7_ Devils Pulpit upgrade to Trustums Hill
Landscape types: Forest
Ability to visually absorb change: Moderate - due to existing contiguous enclosed forest landscape.
Densely forested topography, through higher country. Current highway alignment is contained within enclosed green corridor.

Topography
Undulating, slightly higher elevation
Hydrology
Tabbimoble Swamp catchment

Ecology/Vegetation
Spotted gum forest
Vegetation to west of the existing road alignment south of Glencoe Road is of poorer quality to that on the east.
Land use
Sparsely dotted small pockets of pasture.

Settlement
Isolated rural lots
Spatial qualities
Generally enclosed, with opportunity for framed views to distant mountains south.

Google, Digital Globe, 2010



Character Precincts

P_36. Tabbimoble Swamp Nature Reserve
P_37. New Italy
P_38. Rocky Mouth Creek and floodplain
P_39. Trustums Canal
P_40. Tuckombil Canal
P_41. East Woodburn
P_42. Woodburn township
P_43. Broadwater National Park and Surrounds
P_44. South Richmond River and floodplain

CP 08

Legend

- Alignment and boundary with chainages
- Areas of cut
- Areas of fill
- Existing Pacific Highway route
- Existing Pacific Highway Upgrade alignment
- Strong ridgelines
- Notional ridgelines
- Landscape precinct
- National Parks, State Forests, Nature Reserves, Conservation Areas
- Waterways
- Contours at 10m interval

Landscape Types

- Cleared land (pasture) Cultivated land (crops)
- Littoral scrub
- Floodplain
- Valley lands - foothills
- Open woodland
- Forest
- Ranges and hill tops
- Urban settlement

Landscape character assessment plan

2.4.36_ Precinct 36: Tabbimoble Swamp Nature Reserve
Section 7_ Devils Pulpit upgrade to Trustums Hill
Landscape types: Forest
Ability to visually absorb change: Moderate due to existing contiguous enclosed forest landscape.
This precinct has densely vegetated topography through higher country. In the context of the region, corridors like this provide an important link between the eastern-occurring coastal plains (Bundjalung National Park and Iluka Nature Reserve) and western-occurring coastal ranges and floodplain forest in the Bungawalbin Catchment.

Topography
Precinct is contained by primary ridge at Cypress Road to the north, and ridgeline of Serendipity Road to the south.
Hydrology
Tabbimoble Swamp catchment

Ecology/Vegetation
Melaleuca forest
Spotted gum forest
Melaleuca swamp vegetation
Land use
Generally undeveloped
Small pockets of pasture

Settlement
Isolated rural lots
Spatial qualities
Visually enclosed corridor

Google, Digital Globe, 2010

2.4.37_ Precinct 37: New Italy
Section 7_ Devils Pulpit upgrade to Trustums Hill
Landscape types: Forest, open woodland (pasture), ridges and hill tops
Ability to visually absorb change: High - due to existing modified agricultural landscape.
The precinct is dominated by dense casuarina/melaleuca forest. It is defined by a primary ridge to the south and minor ridge north of New Italy. The highway is predominantly enclosed, with some filtered views to open vegetation in the east, and dense floodplain vegetation to the west. New Italy provides regional cultural landscape interest. The New Italy Settlement landscape and Vineyard Haven are both state listed heritage items.

Topography
Gently undulating
Defined by primary ridge to the south and minor ridge north of New Italy.
Hydrology
Rocky Mouth Creek catchment

Ecology/Vegetation
Casuarina/melaleuca forest
Large casuarinas and eucalypts beside highway in areas
Land use
Pockets of pasture and agriculture

Settlement
New Italy museum and cafe
Scattered rural
Spatial qualities
Predominantly enclosed with filtered views to more open vegetated sections in the east to the north, and west in the south of the precinct.

Google, Digital Globe, 2010

02____Landscape character assessment

2.4.38_ Precinct 38: Rocky Mouth Creek and floodplain
Section 7_ Devils Pulpit upgrade to Trustums Hill
Landscape types: Floodplain (pasture and crops)
Ability to visually absorb change: Moderate - due to open low lying flood plain landscape.
The precinct is defined by the Rocky Mouth Creek catchment and floodplain. This is a transitional landscape from dense woodland to agricultural land associated with the Richmond River floodplain. Isolated pockets of remnant vegetation create a visual layering effect from the dense woodland to the open pasture.

Topography
Generally flat floodplain
Hydrology
Rocky Mouth Creek catchment
Rocky Mouth Creek wetland

Ecology/Vegetation
Wetland
Isolated pockets of remnant vegetation in low-lying areas subject to frequent flooding.
Land use
Agriculture north of Rocky Mouth Creek
Pastureland

Settlement
Rural residential housing around Trustums Hill Road and Williams Road.
Spatial qualities
Generally open within floodplain with patches of remnant vegetation and dense woodland edges.

Google, Digital Globe, 2010

2.4.39_ Precinct 39: Trustums Hill
Section 7_ Devils Pulpit upgrade to Trustums Hill, Section 8 _ Trustums Hill to Broadwater National Park
Landscape types: Forest, open woodland (pasture), ridges and hill tops
Ability to visually absorb change: Moderate - due to existing contiguous areas of enclosed forest landscape.
This precinct centres around the locality of Trustums Hill, and is a transitional precinct between the heavily forested areas to the south and the open floodplain precincts to the north. To the north the disused highway alignment is horizontally and vertically split from the existing road, with green wedges created in between.

Topography
The southern end is relatively flat, whereas to the north the landscape becomes more undulating
Hydrology
Sawpit Creek catchment
Rocky Mouth Creek catchment

Ecology/Vegetation
Dense melaleuca vegetation to the east
Cleared, rural lands to the west
Cut batters seeded with acacias
Land use
Pockets of agriculture and pasture land, particularly around Trustums Hill and The Gap Road.

Settlement
Rural residential
Spatial qualities
Generally enclosed within forested sections. Views across pasture clearings and to distant mountain ranges are possible .

Google, Digital Globe, 2010

02____Landscape character assessment

2.4.40_ Precinct 40: Tuckombil Canal
Section 8 _ Trustums Hill to Broadwater National Park
Landscape types: Floodplain (pasture and crops), forest
Ability to visually absorb change: Low – moderate - due to existing low lying riparian corridor landscape.
Flat landscape, rural lands, with the focal point of the Tuckombil Canal as the entrance to Woodburn. The canal also acts as a transition point between dense woodland and agricultural land of the Richmond River floodplain.

Topography
Tuckombil Canal
Flat with slight batter towards road and bridge.
Hydrology
Junction of Rocky Mouth Creek and Tuckombil Canal
Junction of Evans River and Tuckombil Canal

Ecology/Vegetation
Riverine vegetation
Land use
Agriculture
Cattle grazing

Settlement
Widely scattered rural residential housing.
Agricultural land
Spatial qualities
Transitional. Pockets of vegetation create a layering effect from the dense woodland to the open pasture.

Google, Digital Globe, 2010

2.4.41_ Precinct 41: East Woodburn
Section 8 _ Trustums Hill to Broadwater National Park
Landscape types: Floodplain (pasture and crops), forest
Ability to visually absorb change: Moderate - due to highly modified but scenic landscape associated with the Richmond River.
Precinct has been highly modified for agricultural use and its landscape quality is highly variable. The majority of land is used for cattle grazing, with sugarcane restricted to pockets of more fertile soil. A contrast between sugarcane characterised by well maintained fields, buildings and equipment, and other more 'patchy' areas.

Topography
Floodplain and southern edge of Richmond River.
Slight undulation with some marshy areas at low points and rolling terrain at forest edge, away from river.
Hydrology
Richmond River catchment
Evans River catchment

Ecology/Vegetation
Dense woodland edge associated with Broadwater National Park.
Open woodland and scattered stands of possible remnant woodland species.
Land use
Mostly cattle grazing with pockets of sugarcane on more fertile ground.

Settlement
Scattered rural residential housing
Spatial qualities
The transition from woodland to agriculture to the east is abrupt, with a 'stepped' pattern resulting from clearing and the overlay of shaped fields onto the landscape and creates a well-defined edge.

Google, Digital Globe, 2010

02____Landscape character assessment

2.4.42_ Precinct 42: Woodburn township
Section 8 _ Trustums Hill to Broadwater National Park
Landscape types: Urban settlement, floodplain (crops)
Ability to visually absorb change: High - due to heavily influenced and managed landscape.
This precinct is defined by the extent of urban development. At the core of Woodburn is the commercial and retail strip concentrated along the existing Pacific Highway and southern bank of the Richmond River, between Woodburn Bridge and the turnoff to Evans Head. There are good visual connections between the town and the Richmond River.

Topography
Township on a knoll, with gentle undulating landscape flattening at the edge of town to river floodplain.
Hydrology
Water systems meet immediately to the west of the town: Swampy Creek, Rocky Mouth Creek, Tuckombil Canal and Richmond River.

Ecology/Vegetation
Residential front gardens
Cultural plantings and scattered clusters of mangroves.
Land use
Commercial, retail, light industry
Local primary and high school
Agriculture – cane and crop farming
Tourism

Settlement
Population concentrated around town facilities.
Spatial qualities
Strong sense of town 'edge': sudden transition from urban to rural land use and character.

Google, Digital Globe, 2010

2.4.43_ Precinct 43: Broadwater National Park and surrounds
Section 8 _ Trustums Hill to Broadwater National Park, Section 9_ Broadwater National Park to Richmond River
Landscape types: Littoral scrub, floodplain (pasture)
Ability to visually absorb change: Moderate - due to existing modified landscape.
The Broadwater National Park covers 4231 hectares. While mostly coastal banksia scrub, the vegetation also includes wetlands and eucalypt forests. From a distance the visual strength of this precinct is its visual harmony – its uniform quality over a large area.

Topography
Gentle undulating floodplain
Sand dune system with elevated freshwater ponds
Moderately rolling terrain associated with Rileys Hill
Hydrology
Evans River catchment

Ecology/Vegetation
Dense Banksia scrub
Pockets of wetland forest associated with freshwater ponds
Land use
Flora and fauna conservation
Recreation
Abandoned sand mining
National park

Settlement
Undeveloped
Spatial qualities
While the existing highway severs Broadwater National Park, it provides the opportunity to experience the landscape character whilst travelling through it.

Google, Digital Globe, 2010

02____Landscape character assessment

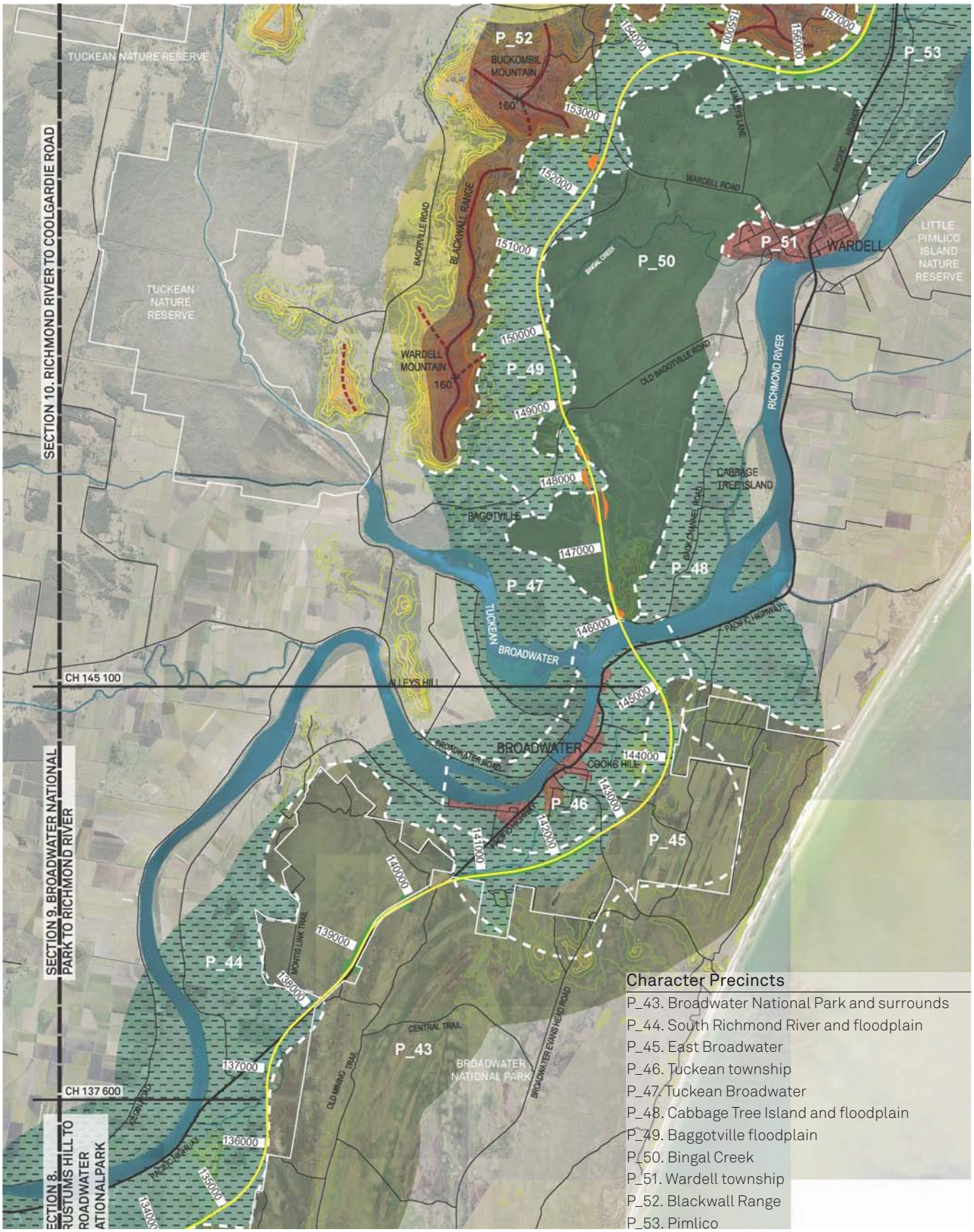
2.4.44_ Precinct 44: South Richmond River, floodplain & Langs Hill Water Reserve
Section 8 _ Trustums Hill to Broadwater National Park, Section 9_ Broadwater National Park to Richmond River
Landscape types: Floodplain (crops)
Ability to visually absorb change: Low – moderate - due to modified but highly scenic landscape associated with the Richmond River.
The Richmond River and floodplain dominate the precinct. The uniform landscape of extensive sugarcane plantations sets off the river and its immediate surrounds. Where mangroves grow very densely, views to the river are obscured. Where mangroves have been cleared or do not exist, a strong visual connection to the river is gained.

Topography
Richmond River
Floodplain
Lang Hill
Rileys Hill
Alleys Hill
Hydrology
Richmond River catchment

Ecology/Vegetation
Scattered pockets of open woodland
Woodland edge of Broadwater National Park.
Mangroves at river edge interspersed with scattered exotic plantings.
Land use
Sugarcane
Isolated pockets of cattle grazing
Transmission tower

Settlement
Isolated farm houses near river
Spatial qualities
Contrast given by the change in vegetation conditions at the river edge creates moments of discovery. The rising topography and vegetated slopes of Rileys Hill, Alleys Hill and Lang Hill create a striking backdrop.

Google, Digital Globe, 2010



Character Precincts

P_43. Broadwater National Park and surrounds
P_44. South Richmond River and floodplain
P_45. East Broadwater
P_46. Tuckean township
P_47. Tuckean Broadwater
P_48. Cabbage Tree Island and floodplain
P_49. Baggotville floodplain
P_50. Bingal Creek
P_51. Wardell township
P_52. Blackwall Range
P_53. Pimlico

CP 09

Legend

- Alignment and boundary with chainages
- Areas of cut
- Areas of fill
- Existing Pacific Highway route
- Existing Pacific Highway Upgrade alignment
- Strong ridgelines
- Notional ridgelines
- Landscape precinct
- National Parks, State Forests, Nature Reserves, Conservation Areas
- Waterways
- Contours at 10m interval

Landscape Types

- Cleared land (pasture) Cultivated land (crops)
- Littoral scrub
- Floodplain
- Valley lands - foothills
- Open woodland
- Forest
- Ranges and hill tops
- Urban settlement

Landscape character assessment plan

02____Landscape character assessment

2.4.45_ Precinct 45: East Broadwater 7 Cooks Hill
Section 9_ Broadwater National Park to Richmond River
Landscape types: Littoral scrub, floodplain (crops)
Ability to visually absorb change: Moderate - due to existing low lying agricultural landscape and areas of coastal scrub vegetation.
The steep eastern slopes of Cooks Hill and forested hilltops visually dominate this precinct. Cooks Hill is a visually impressive natural landmark, rising steeply out of the flat landscape of the floodplain. The landscape of this precinct has been highly modified. The quarry is mostly hidden, except from select points to the north and south.

Topography
Hilltops
Steep to moderate slopes
Rolling hills
Hydrology
Richmond River catchment
Montis Gully catchment
Eversons Creek catchment

Ecology/Vegetation
Native open woodland
Pasture land with small area of sugarcane to the north of the precinct.
Woodland on steep slopes and hilltops.
Land use
Cattle grazing
Quarry

Settlement
Farms and isolated farm houses
Spatial qualities
There is an abrupt transition from the cleared farmland to the dense coastal Banksia scrub of Broadwater National Park.

Google, Digital Globe, 2010

2.4.46_ Precinct 46: Broadwater township
Section 9_ Broadwater National Park to Richmond River
Landscape types: Urban settlement, floodplain (crops)
Ability to visually absorb change: High - due to heavily influenced and managed landscape.
This precinct of Broadwater township lies between the Richmond River and the western slopes of Cooks Hill. The Broadwater Sugar Mill lies at the centre of the township. Most of the residential lots are to the east between the existing Princes Highway and Reservoir Hill with some housing along the edge of the Richmond River.

Topography
Flat floodplain
Moderate slope towards Cooks and Reservoir Hill
Hydrology
Richmond River catchment

Ecology/Vegetation
Residential front gardens
Mangroves at waters edge
Land use
Sugar mill and associated storage
Mix commercial and retail
Sugarcane plantations
Tourism (water related)
Local primary school

Settlement
Small township
Industrial
Commercial, retail and institutional
Spatial qualities
The hilly terrain visually blurs the distinction between the 'urban' eastern edge of the township and the 'rural' cane field landscape.

Google, Digital Globe, 2010

02____Landscape character assessment

2.4.47_ Precinct 47: Tuckean Broadwater
Section 9_ Broadwater National Park to Richmond River, Section 10_ Richmond River to Coolgardie Road
Landscape types: Floodplain (crops)
Ability to visually absorb change: Low - due to highly scenic river floodplain and mangrove landscape.
This precinct is visually contained by three very dominant hills of different heights, including part of the Blackwall Mountain Range and Alleys Hill. Dense mangroves along the water's edge also constrain views beyond the immediate vicinity.

Topography
Short foothills with quick transition from steep slopes to floodplain
Floodplain
Junction of Richmond River and Tuckean Broadwater
Hydrology
Tuckean Broadwater catchment
Richmond River catchment

Ecology/Vegetation
Woodland on step slopes right down to junction with floodplains
Large area of mangroves at junction of Tuckean Broadwater and Richmond River
Land use
Sugarcane plantations
Cattle grazing at foothills

Settlement
Isolated farm houses on elevated terrain
Spatial qualities
Natural 'bowl' experience within surrounding hills.
Enclosed forest with pockets of open woodland pasture and small collection of buildings.

Google, Digital Globe, 2010

2.4.48_ Precinct 48: Cabbage Tree Island and floodplain
Section 10_ Richmond River to Coolgardie Road
Landscape types: Floodplain (crops)
Ability to visually absorb change: Low – moderate - due to highly scenic river floodplain and mangrove landscape.
While this precinct is physically divided into two halves by the Richmond River, the river is not the visually dominant element. This is largely due to limited views of the river from within the precinct: on the western side dense mangroves screen the water; on the eastern side intermittent views are soon lost inland to views of sugarcane.

Topography
Richmond River
Island in the river
Floodplain
Hydrology
Richmond River
Richmond River catchment

Ecology/Vegetation
Sugarcane, tea tree and soybean farming
Scattered Araucaria vegetation
Heathland
Mangroves at river edge
Land use
Agriculture (cane farming and crops)
Tourism (water related)

Settlement
Isolated farm houses
Aboriginal community on Cabbage Tree Island
Spatial qualities
There is an abrupt and strong edge between the sugarcane fields to the west and the heathland vegetation of the Bingal Creek Woodland precinct.

Google, Digital Globe, 2010

02____Landscape character assessment

2.4.49_ Precinct 49: Bagotville floodplain & Lumleys Hill
Section 10_ Richmond River to Coolgardie Road
Landscape types: Floodplain (crops)
Ability to visually absorb change: Moderate - due to modified but scenic undulating landform and enclosed landscape character.
This precinct combines elements of the lower foothills of the Blackwall Mountain Range and the agrarian floodplains west of Bingal Creek Woodland. The rolling terrain emphasises the transition from the mountains to the floodplain. The dense woodland of the hills is offset by the lush cane fields and creates an attractive, high quality landscape.

Topography
Rolling floodplain terrain with a backdrop of hills and ridges
Flat to moderate foothills and valleys
Hydrology
Bingal Creek catchment
Tuckean Broadwater catchment

Ecology/Vegetation
Scattered woodland in flats
Pasture/cattle grazing on foothills and rolling hills
Sugarcane on gentle slopes
Land use
Cattle grazing
Sugarcane plantations
Quarry

Settlement
Small rural residential developments
Scattered rural farm housing and associated structures
Spatial qualities
Enclosed views between the Blackwall Range and Bingal Creek Woodland, with interplay of crop rotation.

Google, Digital Globe, 2010

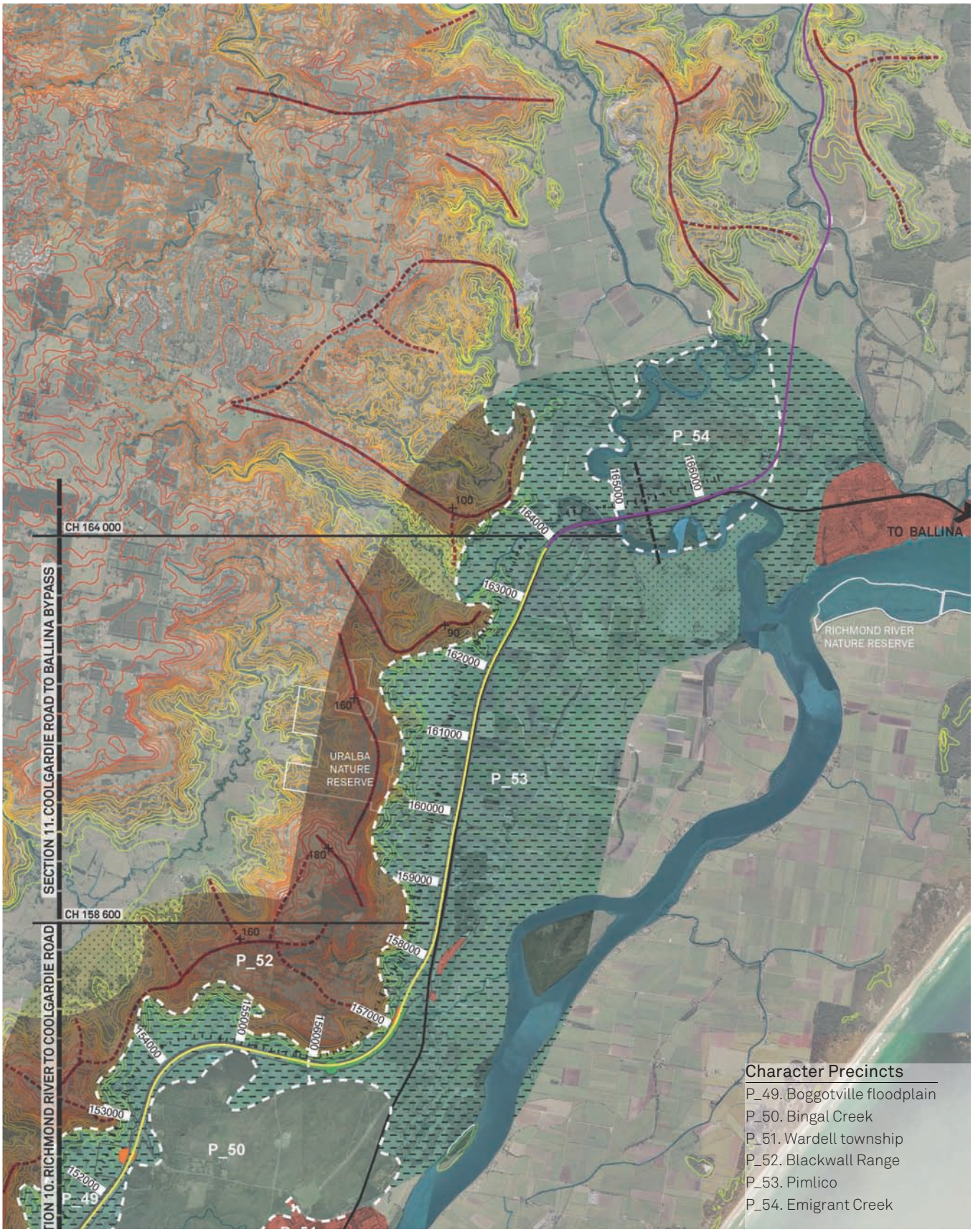
2.4.50_ Precinct 50: Bingal Creek
Section 10_ Richmond River to Coolgardie Road
Landscape types: Forest
Ability to visually absorb change: Low – moderate **- due to scenic undulating landform and enclosed landscape character.**
This precinct is predominantly dense mature forest and Banksia heath forest with limited disturbance. There is consistency/uniformity in the robust growth of the plants, which is highly sensitive to visual intrusion. It appears to constitute ancient floodplain with remnant sand dunes.

Topography
Flat
Sand
Hydrology
Bingal Creek catchment
Richmond River catchment

Ecology/Vegetation
Woodland
Dense Banksia heath
Land use
Woodland

Settlement
Undeveloped
Spatial qualities
Enclosed views throughout heath forest, some distant views to Blackwell Range.

Google, Digital Globe, 2010



CP 10

Legend

- Alignment and boundary with chainages
- Areas of cut
- Areas of fill
- Existing Pacific Highway route
- Existing Pacific Highway Upgrade alignment
- Strong ridgelines
- Notional ridgelines
- Landscape precinct
- National Parks, State Forests, Nature Reserves, Conservation Areas
- Waterways
- Contours at 10m interval

Landscape Types

- Cleared land (pasture) Cultivated land (crops)
- Littoral scrub
- Floodplain
- Valley lands - foothills
- Open woodland
- Forest
- Ranges and hill tops
- Urban settlement

Landscape character assessment plan

02____Landscape character assessment

2.4.51_ Precinct 51: Wardell township
Section 10_ Richmond River to Coolgardie Road
Landscape types: Urban settlement
Ability to visually absorb change: High - due to heavily influenced and managed but scenic landscape.
The precinct is defined by the extent of urban development of Wardell. The town is divided by the Richmond River running east to west. Perhaps because of this historic division there is no one central core to the township. The post office, police station and other emergency services are separate from shops and other commercial/retail outlets.

Topography
Flat floodplain east and west of Richmond River.
Older parts of the town are in low-lying areas while newer buildings are on higher, flatter ground away from the river edge.
Hydrology
Richmond River catchment

Ecology/Vegetation
Mature trees onto the existing woodland.
Residential front gardens
Land use
Mix of commercial and retail
Residential
Tourism (boat ramps, crafts, picnic facilities, bed and breakfast).

Settlement
Small township population
Commercial, retail and institutional
Rural residential edge
Spatial qualities
Southern part of town is visually exposed within sugarcane plantations.
Northern section is enclosed within forested surrounds.

Google, Digital Globe, 2010

2.4.52_ Precinct 52: Blackwall Range
Section 10_ Richmond River to Coolgardie Road, Section 11_ Coolgardie Road to Ballina Bypass
Landscape types: Forest, valley lands – foothills, ranges and hill tops
Ability to visually absorb change: Moderate-low - due to prominent landform and scenic agricultural and forested landscape.
This precinct is defined by the Blackwall Range. The rolling terrain emphasises the transition from the mountains to the floodplain. The dense woodland of the hills is offset by the lush cane fields and creates an attractive, high quality landscape.

Topography
Steep slopes and hill tops
Valleylands
Hydrology
Bingal Creek catchment

Ecology/Vegetation
Dense woodland
Scattered pockets of pasture and open woodland.
Land use
Limited and isolated pockets of agriculture.
Rural residential
Woodland

Settlement
Scattered small rural lots with farm houses.
Spatial qualities
Precinct is generally described as the experience of transition between valley systems, with predominately open views from ridgetops.

Google, Digital Globe, 2010

02____Landscape character assessment

2.4.53_ Precinct 53: Pimlico
Section 11_ Coolgardie Road to Ballina Bypass
Landscape types: Floodplain (crops)
Ability to visually absorb change: Low – moderate - due to modified but scenic agricultural landscape associated with the Richmond River.
Pimlico is a precinct that primarily includes the agrarian floodplains east to the Richmond River. The lifting and rolling terrain emphasises the steep change in topography from the mountain range to the floodplains. The dense woodland of the hills is offset by the lush cane fields and creates an attractive, high quality landscape.

Topography
Dramatic continuous folding of ridges and valleys.
Flat to moderate foothills and valleys extending east.
Hydrology
Emigrant Creek catchment
Richmond River catchment

Ecology/Vegetation
Open woodland
Grassland
Agriculture
Land use
Woodland
Cattle grazing
Agriculture (cane farms)
Isolated farm houses

Settlement
Isolated rural housing
Spatial qualities
Alternating cycle of open and closed views along the highway according to crop rotation, with backdrop of forested hills to the north-west.

Google, Digital Globe, 2010

2.4.54_ Precinct 54: Emigrant Creek
Section 11_ Coolgardie Road to Ballina Bypass
Landscape types: Floodplain (crops)
Ability to visually absorb change: Low – moderate - due to modified but scenic agricultural landscape associated with the Richmond River.
Emigrant Creek is characterised by winding path of the creek, which feeds into the Richmond River. The precinct is defined by the heavily vegetated edges of the Creek, which form a transitional landscape between the extensive floodplain of the Richmond River and the township of Ballina.

Topography
Generally flat floodplain with slight undulations.
Hydrology
Emigrant Creek catchment
Duck Creek catchment
Chillcotts Creek catchment
Maguires Creek catchment

Ecology/Vegetation
Riverine and wetland vegetation, with pockets of pastureland.
Land use
Wetlands
Golf driving range
Church
Caravan park

Settlement
Scattered rural residential properties and scattered recreation, commercial industrial developments.
Spatial qualities
Visually enclosed within the bend of Emigrant Creek by riverine vegetation.

Google, Digital Globe, 2010

02____Landscape character impacts

2.5_ Introduction

Further landscape character assessment has been undertaken to determine the typical landscape character impact for each of the 11 nominated project sections. Assessment of magnitude, sensitivity and impact for each character precinct in each project section is determined in the following pages. These provide the basis of the overall character impacts for each project section. The findings are summarised in 2.16.13.

2.5.1_ Magnitude

In character assessment magnitude refers to the nature of the project and its compatibility with existing landscape character types. All anticipated elements of the project including bridges, embankments, cuttings and alignment are considered. For the character assessment the height and length of embankments as well as the location (on floodplain, near townships, within woodland) all have a bearing on the magnitude of the physical presence of the project. Generally an embankment up to four metres is considered of low magnitude, an embankment with one bench – moderate, anything higher considered high magnitude. The scale, form and character of the project helps to determine the magnitude of the change.

2.5.2_ Sensitivity

Sensitivity is also assessed based on perceived value judgements. A judgement is made as to the quality of the landscape, as well as the coherence (variety, patterns), frequency of residences, dwellings viewers and scenic quality. The following sensitivity judgements have been used as the basis for this character assessment:

_Water and natural environments more highly valued than urban, modified landscapes
_Industrial areas have least sensitivity
_Areas of unique scenic quality have higher sensitivity
_Contrast and variety within the landscape will assist in absorption of new elements within a landscape: a mixture of woodland and grassland would enable greater integration than cleared low lying floodplain
_A pristine environment would have a greater sensitivity with less ability to absorb new structures
_Frequency of viewing would affect sensitivity with residential dwellings creating a higher sensitivity

Sensitivity is also influenced by settlement patterns, topography, vegetation, and circulation

2.5.3_ Impact

Impact is a function of the magnitude and sensitivity rating in accordance with the RTA Guide Note EIA-N04.

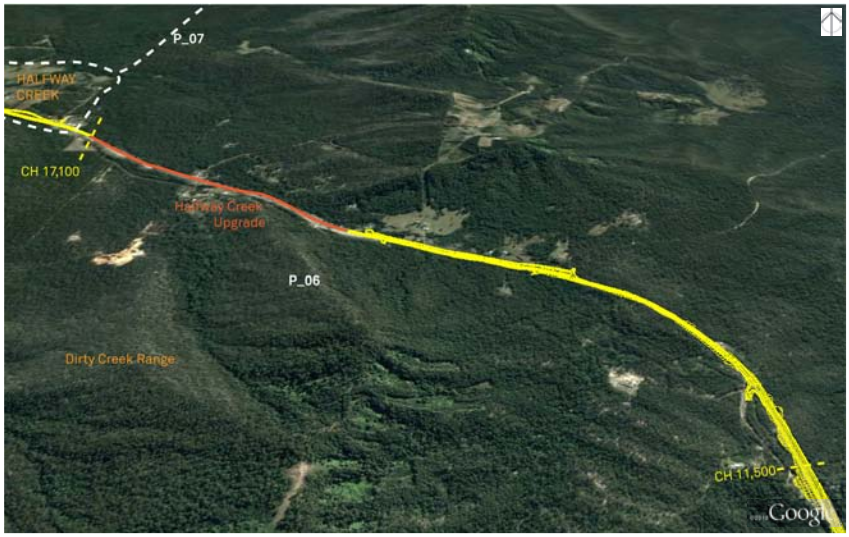
Table 03_ Landscape character and visual impact grading matrix

MAGNITUDE

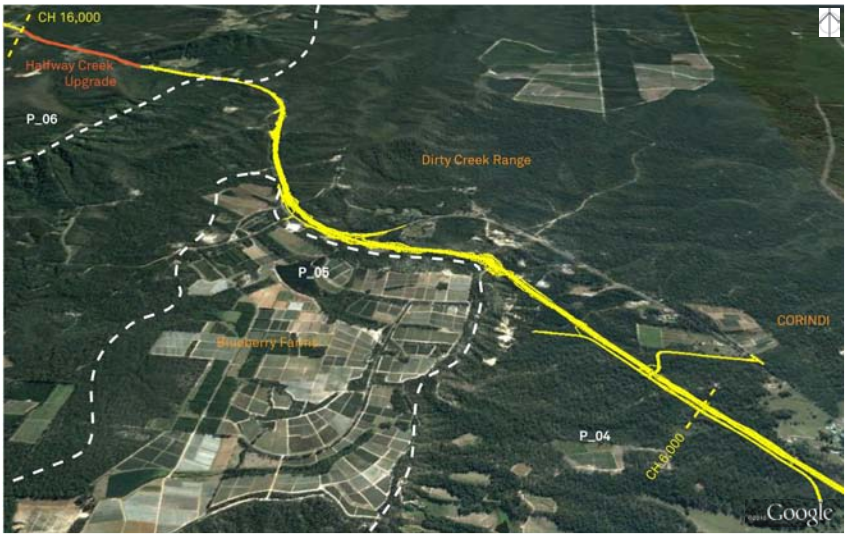
SENSITIVITY

	High	High to Moderate	Moderate	Moderate to low	Low	Negligible
High	High Impact	High Impact	Moderate - high	Moderate - high	Moderate	Negligible
High to Moderate	High Impact	Moderate - high	Moderate - high	Moderate	Moderate	Negligible
Moderate	Moderate - high	Moderate - high	Moderate	Moderate	Moderate - low	Negligible
Moderate to low	Moderate - high	Moderate	Moderate	Moderate - low	Moderate - low	Negligible
Low	Moderate	Moderate	Moderate - low	Moderate - low	Low impact	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

02____Landscape character impacts



Chainage 11,500 -17,100



Chainage 6,000 -16,000

Section 1_ Woolgoolga to Halfway Creek

Chainage 0-10,500

All base terrain images copyright Google, Digital Globe, 2010

02____Landscape character impacts

2.6_ Concept design landscape character impacts

2.6.1_ Section 01: Woolgoolga to Halfway Creek, CH0-17,000 (17 km)

Precincts:
P_01 Arrawarra Headland and Corindi Beach
P_02 Wedding Bells State Forest
P_03 Blackadder Gully
P_04 Dirty Creek blueberry farms
P_05 Dirty Creek Forest
P_06 Halfway Creek Forest

Magnitude

Key bridges

Corindi Creek: 90 m long twin bridge over Corindi Creek.
Corindi floodplain bridge: 300 m long.
Cassons Creek bridge:
Over bridges at Sherwood Creek, Kangaroo Trail Road.
Underpasses at Corindi Road and Range Road.

Key embankments

Generally between 0-5 m. Highest embankment 14.22 m at CH9,500 . Within Precinct 3 the highway is in embankment apart from the cutting under Kangaroo Trail Road. Embankments across the floodplain increase the magnitude.

Key cuttings

Generally between 2.5-6 m. The largest cutting is at the Dirty Creek Range. This cutting is approximately 42 m at the deepest point. The width of the cutting is around 100 m from top of the cutting to the centre line of the project. Widened median from chainage 4950 -6900.

Sensitivity

The landscape is highly modified with small rural and agricultural holdings and the quality of the land use is varied. There is a mosaic of woodland and pastureland. Some vegetation clearance would be required. The project is located west of Corindi Beach township, limiting the impact on the town. There are limited residences along the route, which follows the eastern edge of the blueberry farms. Beyond this the landscape is a mosaic of agricultural lands and woodland and has the capacity to absorb the introduction of a new road.

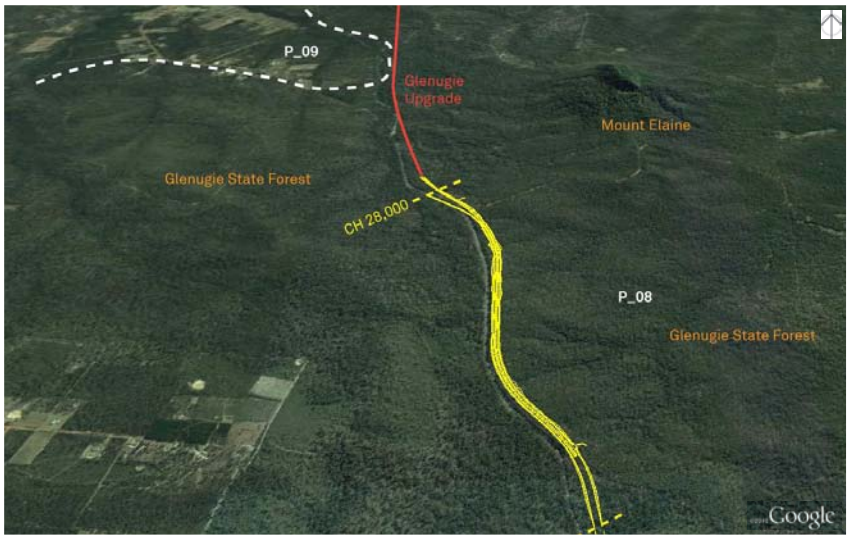
Impact: Moderate

The project deviates significantly from the existing route creating a new disturbance within the landscape. The cutting through the Dirty Creek Range would be visually prominent, primarily viewed by motorists, with a small number of rural residences. The project connects with the existing highway adjacent to Precinct 5. The project follows the existing road through the Dirty Creek plateau. Cuttings and embankments are small to low in this area.

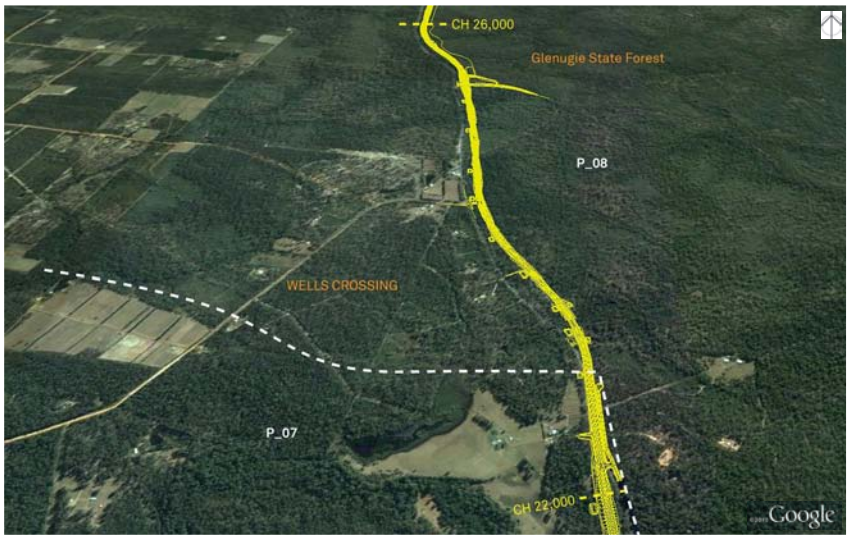
Table 04_ Section 1 landscape character impacts

Precinct	Magnitude	Sensitivity	Impact
P_01	**Low** The highway would remain within the existing road corridor within P_01.	**Low** The highway is within a low cutting with limited views in or out.	**Low**
P_02	**Low** The highway would remain within the existing road corridor within P_02.	**Low** The highway is within a low cutting with limited views in or out	**Low**
P_03	**Moderate** Bridges and embankments over the Corindi Creek and its floodplain.	**Moderate** Modified landscape with small rural and agricultural holdings.	**Moderate**
P_04	**High** Large cutting up to 42 m through the Dirty Creek Range and smaller areas of low embankment.	**Moderate** New road through bushland. Limited residences.	**Moderate-high**
P_05	**Low** Upgrade to the existing highway. Low embankments.	**Low** The project is substantially screened from the blueberry farms by roadside vegetation.	**Low**
P_06	**Low** Upgrade to the existing highway. Low embankments.	**Low** Upgrade to existing highway through bushland with pockets of pasture. Limited residences, good absorption capacity.	**Low**

02____Landscape character impacts

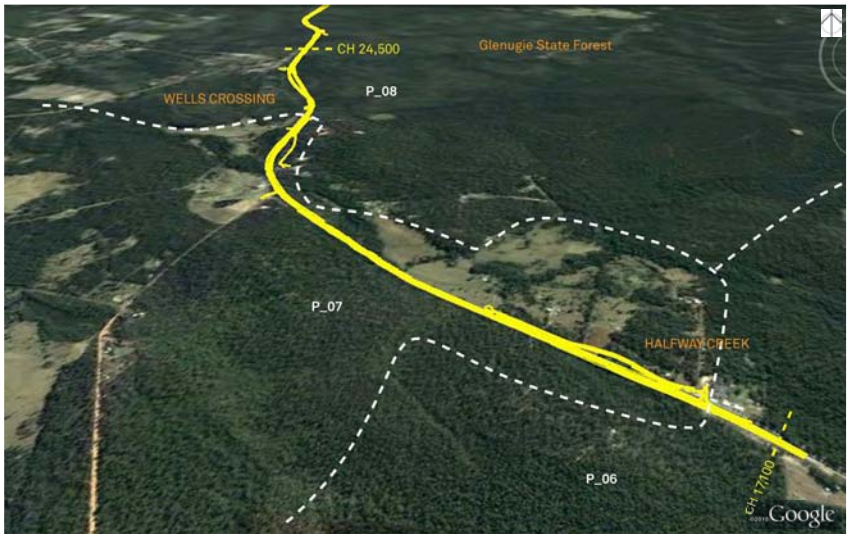


Chainage 25,500 - 28,000



Chainage 22,000 - 26,000

Section 2_ Halfway Creek to Glenugie Upgrade



Chainage 17,100 -24,500

All base terrain images copyright Google, Digital Globe, 2010

02____Landscape character impacts

2.6.2_ Section 02: Halfway Creek to Glenugie Upgrade CH17000-CH28700 (11.7 km)

Precincts:
P_07: Halfway Creek
P_08: Glenugie State Forest

Magnitude
Key bridges
Small twin bridge over Halfway Creek (22800)
Small twin bridge over Wells Crossing (24440)
Overpass a Bald Knob Tick Gate Road.
Underpass at Halfway Creek.
Key embankments
The highway contains embankments within this section generally between 0-3.5 m. The highest embankment (approximately 7 m) is located north of the bridge over Halfway Creek.
Key cuttings
There are a small number of low cuttings within this section, generally between 0-1.5 m. The largest cutting is 5 m at the northern end of the section where it connects with the Glenugie upgrade.
Ancillary Items
Truck weigh station at 19500

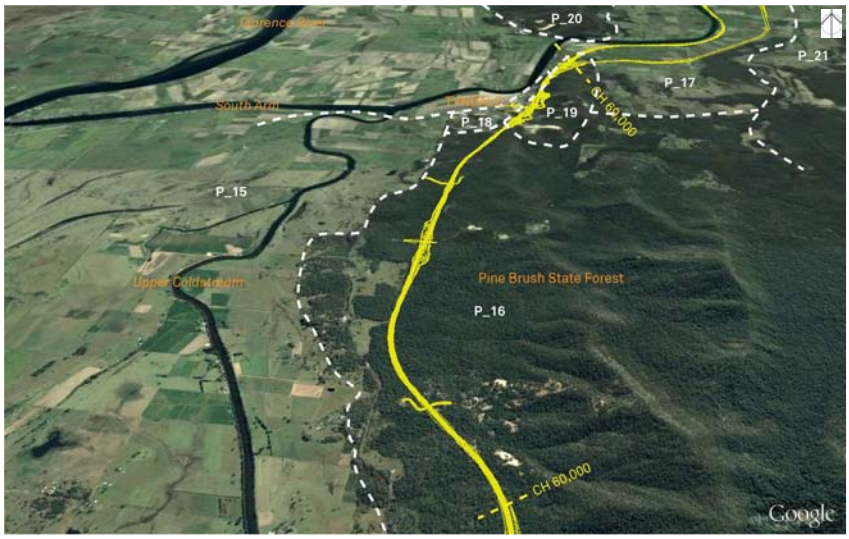
Sensitivity
The landscape contains woodland with cleared pockets. The existing highway would be widened with some deviations. There are limited dwellings or residences within this area.

Impact: Low
The impact is considered low as the existing highway would be adjusted to include the project.

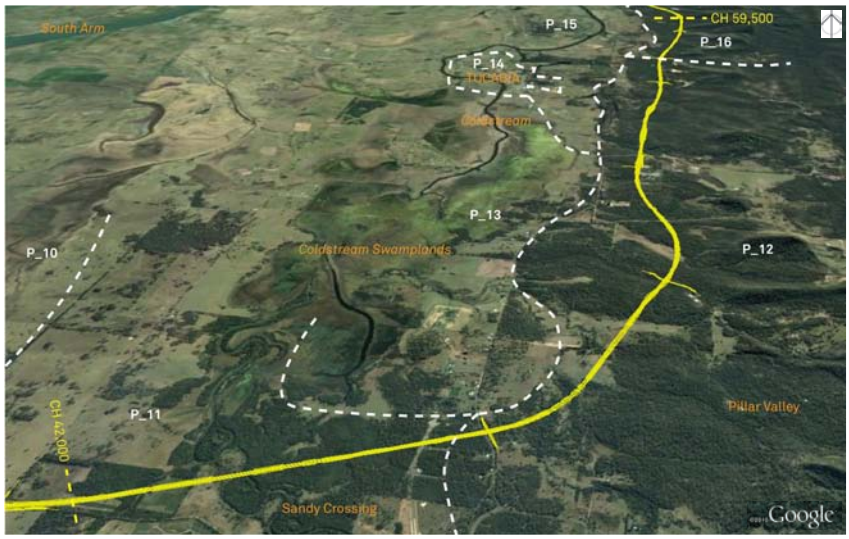
Table 05_ Section 2 landscape character impacts

Precinct	Magnitude	Sensitivity	Impact
P_07	**Low** Low embankments and low cuttings, with two small bridges within existing road corridor.	**Low** Partially cleared pastureland with roadside vegetation and enclosed character.	**Low**
P_08	**Low** Low embankments and low cuttings within existing road corridor.	**Low** Undulating plateau, limited residences gentle gradients with roadside vegetation.	**Low**

02____Landscape character impacts

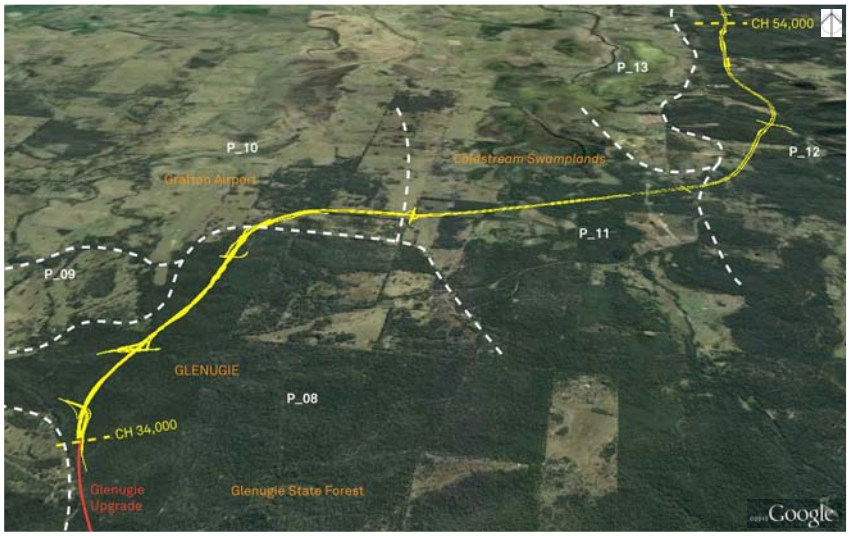


Chainage 60,000 - 69,000



Chainage 42,000 - 59,500

Section 3_ Glenugie Upgrade to Tyndale



Chainage 34,000 -54,000

All base terrain images copyright Google, Digital Globe, 2010

02____Landscape character impacts

2.6.3_ Section 03: Glenugie Upgrade to Tyndale CH33,800-CH68,800 (35.0 km)

Magnitude

Key bridges

Numerous bridges are required within the section. The most significant bridges include:

Approximately 690 m of bridging across 1.4 km over the Coldstream River.

Approximately 400 m of bridging over the Pillar Valley Creek.

Key embankments

Embankments are generally between 0-8 m. The largest embankments are located near the township of Tyndale. These are 10-11 m.

Extensive areas of embankment are required over the Coldstream River

Key cuttings

Some cuttings are 9-22 m deep. The most significant is a cutting east of the township of Tyndale.

Precincts:
P_08: Glenugie State Forest
P_09: Glenugie Pasture
P_10: Grafton Airport/Pheasant Creek
P_11: Coldstream River/Sandy Crossing
P_12: Pillar Valley
P_13: Coldstream River swamplands
P_14: Tucabia township
P_15: Upper Coldstream
P_16: Pine Brush State Forest
P_17: South Arm floodplain
P_18: Tyndale township
P_19: Bondi Hill

Sensitivity

There are areas of unique scenic quality including the Pillar Valley, Somerville Flat, Coldstream River valley, and the Clarence River. The new alignment would be located within woodland of the foothills of the Pine Brush State forest enclosing the road and limiting views from the west. The alignment passes close to the Tyndale township precinct in the north of the section. The existing Pacific Highway is located to the north of the town, the project would be located to the east, with a new interchange requiring significant cuttings through Bondi Hill.

Impact: Moderate-High

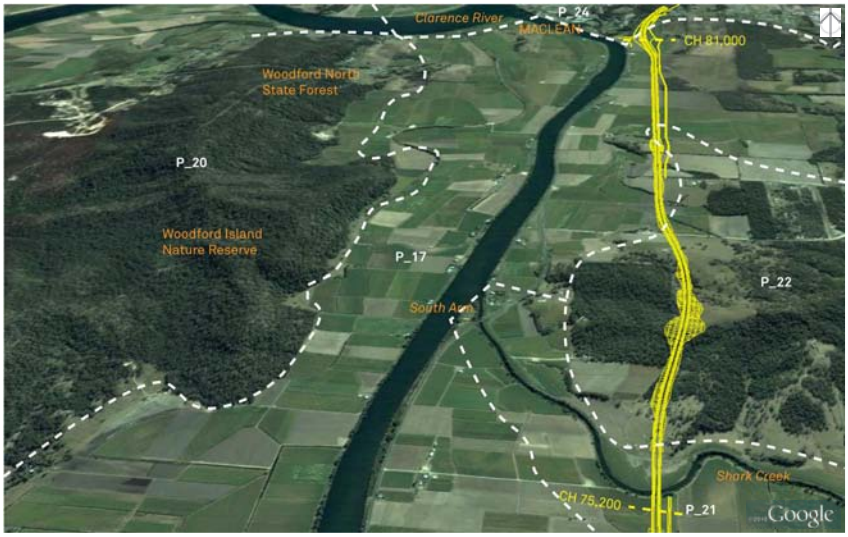
The alignment leaves the existing highway at Eight Mile Lane and creates a new corridor until it rejoins the existing highway at Tyndale. There are several areas considered to be of unique scenic quality including rivers that would be subject to extensive embankments.

Table 06_ Section 3 landscape character impacts

Precinct	Magnitude	Sensitivity	Impact
P_08	**Low** New corridor through foothills of State Forest. Low embankments and low cuttings within existing corridor.	**Low** Woodland and grazing. Limited residences, good absorption capacity.	**Low**
P_09	**Negligible** P_09 is outside the road corridor.	**Negligible** Views limited by vegetation and landform.	**Negligible**
P_10	**Moderate** New road corridor generally along existing local roads. Some areas of embankment required.	**Low** Woodland with pastureland. Limited residences. Good absorption capacity.	**Moderate-Low**
P_11	**Moderate/High** There are a number of large bridge structures crossing the Coldstream River and Pillar Valley Creek.	**Moderate** This is an area of high landscape quality. Extensive views towards the north and south.	**Moderate-High**
P_12	**Moderate** Moderate embankments and cuttings within a new road corridor.	**Moderate** The foothills of the Pillar Valley are wooded and have absorption capacity.	**Moderate**
P_13	**Negligible** P_13 is outside the road corridor.	**Low** Scenic views toward swamplands from corridor.	**Negligible**
P_14	**Negligible** P_14 (Tucabia) is outside the road corridor.	**Negligible** The project would not be visible from the township of Tucabia.	**Negligible**
P_15	**Negligible** P_15 is outside the road corridor.	**Moderate** Some views to Coldstream River Valley possible.	**Negligible**
P_16	**Moderate** Cuttings and embankments hidden in the foothills.	**Moderate** Woodland foothills with scattered cleared areas.	**Moderate**
P_17	**Negligible** P_17 is outside the road corridor.	**Low** Mosaic of cane plantations and farmland.	**Negligible**
P_18	**High** Large cuttings up to 22 m of significant length.	**High** Cutting would be visible from Tyndale.	**High**
P_19	**High** Large cuttings up to 22 m of significant length.	**High** Cutting would be visible from Tyndale.	**High**

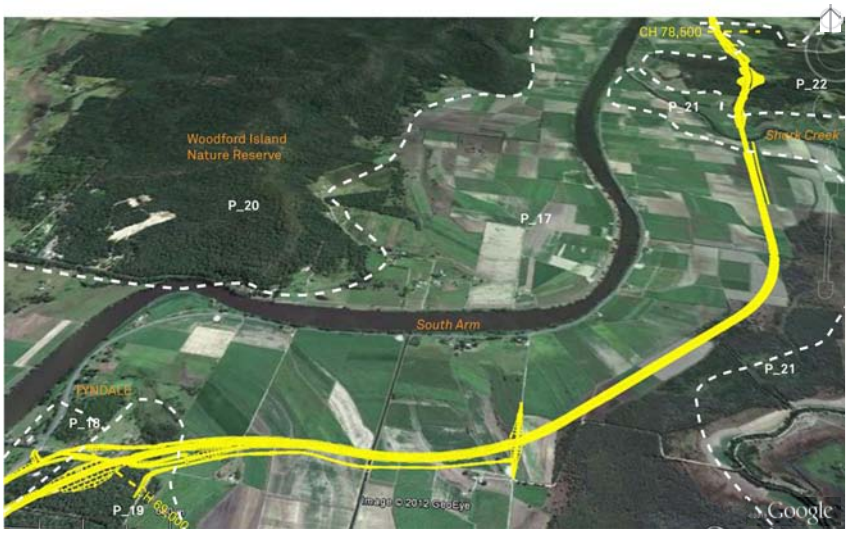
02____Landscape character impacts

Chainage 80,000 - 82,400



Chainage 75,200 - 81,000

Section 4_ Tyndale to Maclean



Chainage 69,000 -78,500

All base terrain images copyright Google, Digital Globe, 2010

02____Landscape character impacts

2.6.4_ Section 04: Tyndale to Maclean CH 68,800-CH82,000 (13.2 km)

Precincts:
P_17: South Arm floodplain
P_20: Woodford Island
P_21: Shark Creek
P_22: Green Hill
P_23: Gulmarrad township
P_24: Maclean/Townsend township
P_25: Maclean Pinnacle

Magnitude
Key bridges
Largest bridge is located over Shark Creek, approximately 800 m long within an area of textured agricultural quality.
There is a bridge associated with the interchange at Maclean.
Key embankments
Generally embankments range from 0-6 m. The most extensive embankment is associated with the Shark Creek crossing.
Key cuttings
Up to 24m cutting through Green Hill adjacent to McIntyres Lane.

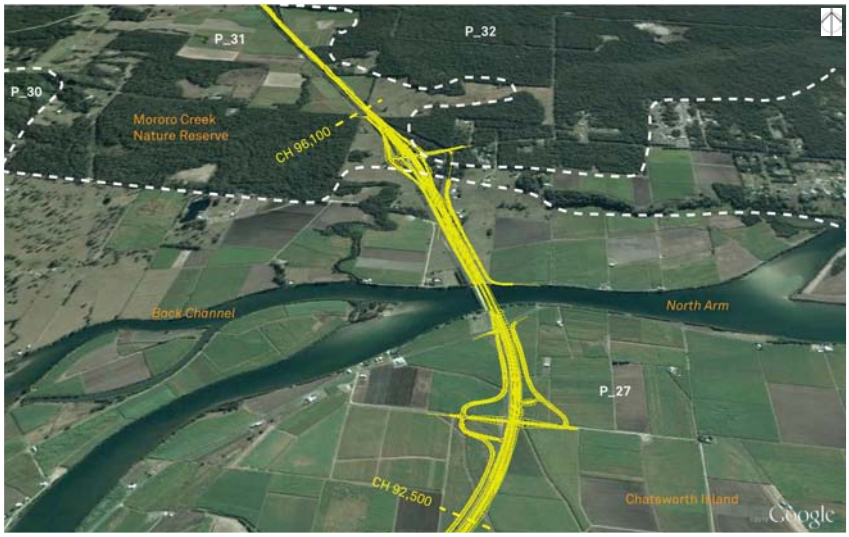
Sensitivity
The mosaic of sugarcane plantations would be disrupted however the alignment of the road appears to follow the pattern of the plantations. The seasonal nature of the sugarcane creates a changeable amount of screening for the road.

Impact: Moderate
The road would create new infrastructure within the landscape however the impact would be minimised by the obstruction of views from sugarcane plantations. Where the road is in cutting through Green Hill near McIntyres Lane the impact would be greatest as the cutting would be visible from the floodplain.

Table 07_ Section 4 (Shark Creek) landscape character impacts

Precinct	Magnitude	Sensitivity	Impact
P_17	**Moderate** Embankments across the floodplain up to 6 m.	**Moderate** Interruption of existing pattern of sugarcane plantations and ownership patterns.	**Moderate**
P_18	**High** Large cuttings up to 24 m of significant length.	**High** Cutting would be visible from Tyndale.	**High**
P_19	**High** Large cuttings up to 24 m of significant length.	**High** Cutting would be visible from Tyndale.	**High**
P_20	**Negligible** P_17 is outside the road corridor.	**Moderate** Woodford Island is an elevated area with views over the road corridor.	**Negligible**
P_21	**Moderate** Large bridge (800 m) across Shark Creek with large approach embankments.	**Low** Shark Creek is generally cleared with limited riparian vegetation. Sugarcane plantations up to the edge of the creekline.	**Moderate-Low**
P_22	**Moderate** Large cutting through Green Hill.	**Moderate** Green Hill is an elevated area within flat floodplain and is visible from a distance.	**Moderate**
P_23	**Low** Embankments across the floodplain up to approximately 3m.	**Low** Gulmarrad township is disconnected from the road works through vegetation, distance and topography.	**Low**
P_24	**Moderate** A new interchange would be required at Maclean however this would be within close proximity to the existing road corridor.	**Moderate-Low** Upgrade of existing road infrastructure.	**Moderate**
P_25	**Low** Limited infrastructure required. Small embankments within the existing road corridor.	**Low** Upgrade of existing road infrastructure.	**Low**

02____Landscape character impacts



Chainage 92,500 - 96,100

Chainage 88,000 - 92,500

Section 5_ Maclean to Iluka Road

Chainage 82,400 - 89,500

All base terrain images copyright Google, Digital Globe, 2010

02____Landscape character impacts

2.6.6_ Section 05: Maclean to Iluka Road CH82,000 - CH96,400 (13.2 km)

Precincts:
P_25: Maclean Pinnacle
P_26: Yaegl Nature Reserve
P_27: Clarence River floodplain
P_28: Ashby
P_29: Harwood township
P_30: Chatsworth Hill
P_31: Mororo Creek Valley

Magnitude
Key bridges
Approximately 1.3 kilometre long bridge spanning the Clarence River at Harwood.
Approximately 200 m long bridge spanning North Arm
New overpasses at Watts Lane, Chatsworth Road, Carrolls Lane and Iluka Road.
Key embankments
Generally the project is on an embankment between the Clarence River and North Arm. The embankment is up to three metres.
Key cuttings
Nil

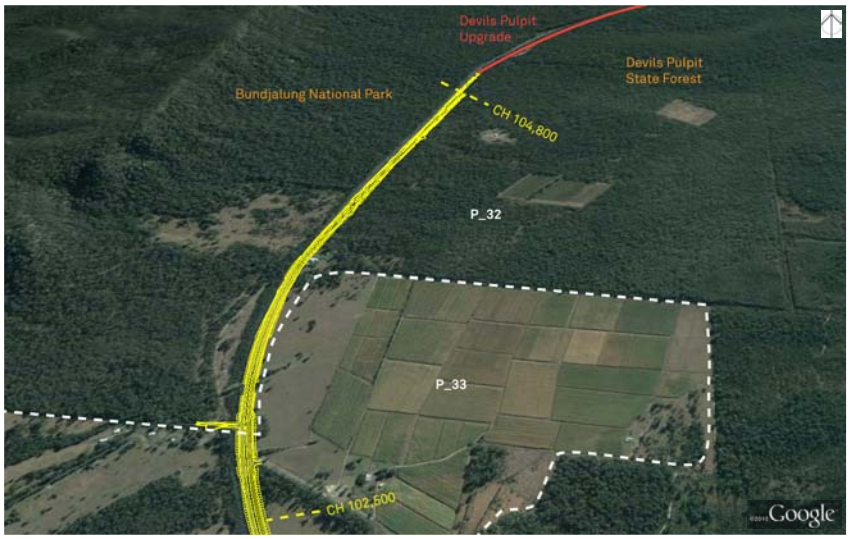
Sensitivity
The landscape has absorption capacity. The project would widen the existing highway corridor which is located along the edges of landscape units. The project would have limited impact on the Yaegl Nature Reserve. There is a mixture of woodland, grassland and cropland.

Impact: Moderate
Largest impact would be the embankment between the Clarence River and the North Arm extension. This embankment is up to three metres and is within or parallel to the existing road corridor.

Table 09_ Section 5 landscape character impacts

Precinct	Magnitude	Sensitivity	Impact
P_25	**Low** Limited infrastructure required. Small embankments within the existing road corridor.	**Low** Upgrade of existing road infrastructure.	**Low**
P_26	**Low** Low embankments required up to 3 m.	**Moderate** Upgrade of existing road infrastructure along edge between Yaegl Nature Reserve and sugarcane plantations.	**Moderate-Low**
P_27	**High** Generally embankment up to 3 m within existing road corridor across floodplain. Bridge crossing over Clarence River and new overpasses with associated embankments.	**Moderate** Floodplain with extensive sugarcane plantations. Highly agricultural with variations throughout the year with an existing highway character.	**Moderate - High**
P_28	**Negligible** P_28 is outside the road corridor.	**High** Wooded ridges and foothills with views across the floodplain.	**Negligible**
P_29	**High** Bridge Crossing over Clarence River with associated embankments.	**High** Small township. Works within existing road corridor. Residential area. Sensitive heritage items.	**High**
P_30	**Negligible** P_30 is outside the road corridor.	**High** Wooded ridges and foothills with views across the floodplain.	**Negligible**
P_31	**Low** Low embankments required up to 3 m.	**Low** Upgrade of existing road infrastructure.	**Moderate-Low**

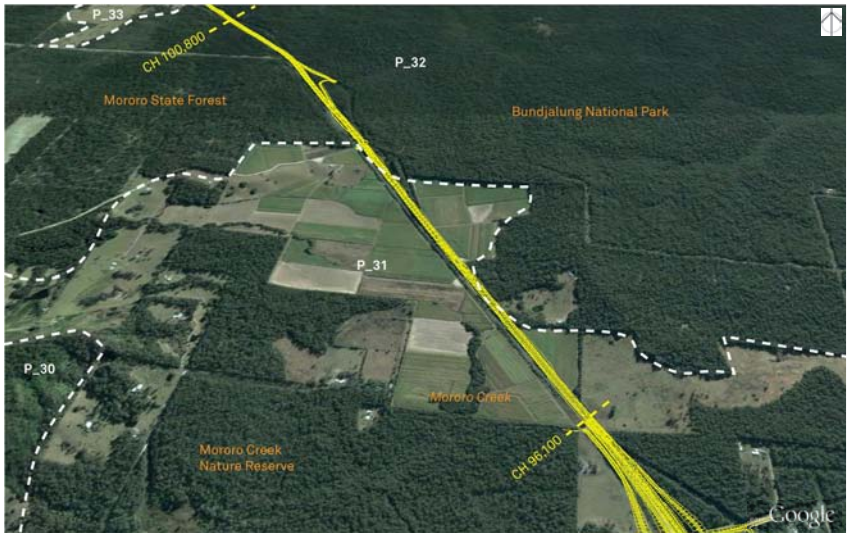
02____Landscape character impacts



Chainage 102,500 - 104,800

Chainage 98,500 - 104,000

Section 6_ Iluka Road to Devils Pulpit upgrade



All base terrain images copyright Google, Digital Globe, 2010

Chainage 96,100 - 100,800

02____Landscape character impacts

2.6.7_ Section 06: Iluka Road to Devils Pulpit upgrade CH96,400-105,600 (9.2 km)

Precincts:
P_31: Mororo Creek Valley
P_32: Bundjalung National Park
P_33: Jacky Bulbin Flat

Magnitude
Key bridges
Duplication of existing bridge over Tabbimoble Creek approximately 140 m long.
Duplication of existing bridge over Tabbimoble Trail overpass approximately 70 m long.
Key embankments
The road is generally on an embankment up to 3.5 m
Key cuttings
Minimal.

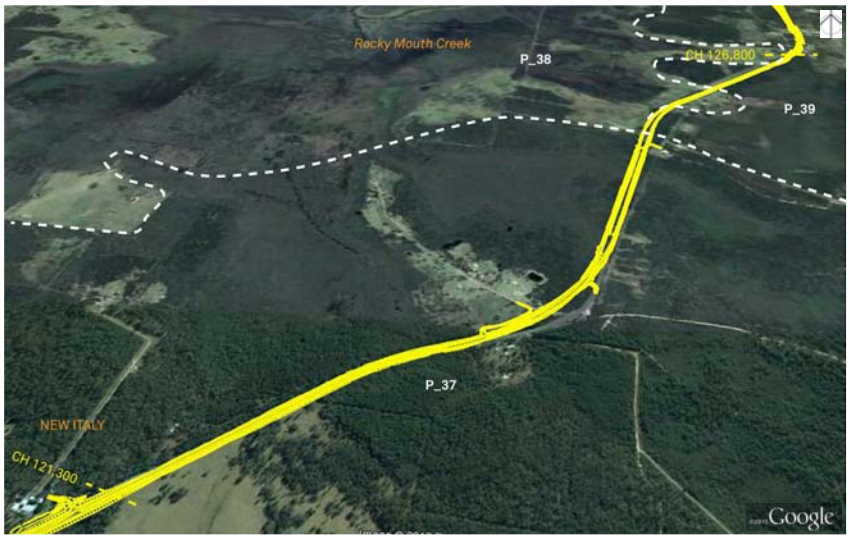
Sensitivity
The road passes through a variety of landscape units. A mixture of woodland and grassland along undulating landform enables screening from surrounding areas.

Impact: Low
The project would require a widening of the existing corridor. The mosaic of woodland, pasture land and cleared areas gives the landscape good absorption capacity.

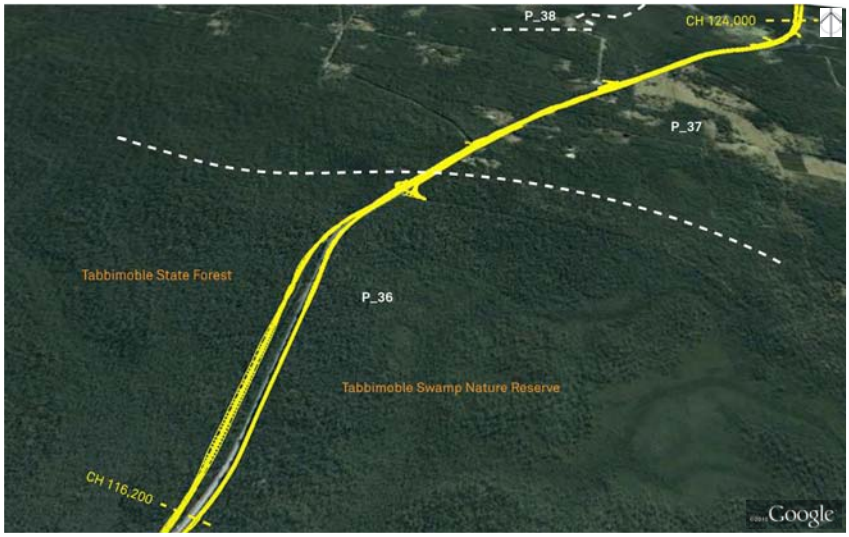
Table 10_ Section 6 landscape character impacts

Precinct	Magnitude	Sensitivity	Impact
P_31	**Low** Low embankments required up to 3 m.	**Low** Upgrade of existing road infrastructure within agricultural area with roadside vegetation.	**Low**
P_32	**Low** Low embankments required up to 3 m.	**Low** A variety of landscape units with good absorption capacity.	**Low**
P_33	**Low** Upgrade of existing road infrastructure with areas of small cut and embankments.	**Low** A variety of landscape units with good absorption capacity.	**Low**

02____Landscape character impacts

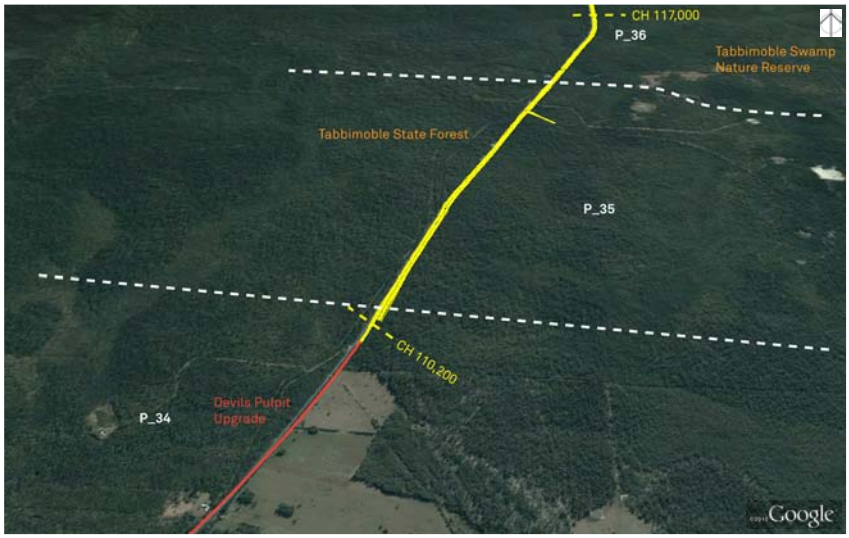


Chainage 121,300 - 126,800



Chainage 116,200 - 124,000

Section 7_ Devils Pulpit upgrade to Trustums Hill



Chainage 110,200 - 117,000

02____Landscape character impacts

2.6.8_ Section 07: Devils Pulpit upgrade to Trustums Hill CH111,100-CH126,400 (15.3 km)

Magnitude

Key bridges

Bridge duplications over the Tabbimoble floodways

Key embankments

The roadway is generally on an embankment up to 3.5 m

Key cuttings

Some cuttings required up to 8.5 m deep, generally associated with intersection with existing roads.

Features

Widened median between chainage's 114,100 and 121,100

Sensitivity

The landscape has a large capacity to absorb the upgrade of the existing road corridor. The landform is generally flat with some undulations. The vegetation is varied, containing some areas of cleared grazing land within woodland. There are limited residences within this stage. The state listed heritage items at New Italy are assessed separately in Section 3.

Impact: Low

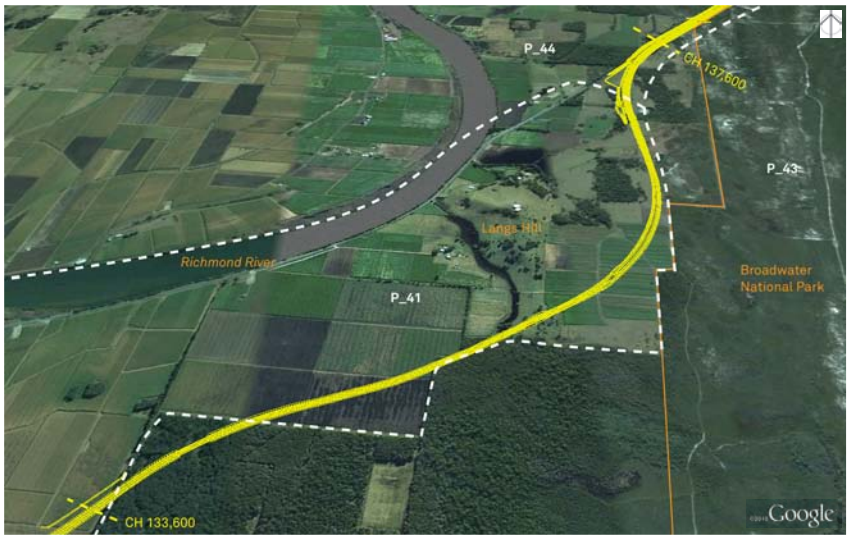
The impact is considered low as the project is an upgrade to the existing road corridor within an area that contains a variety of landscape units capable of absorbing the proposed changes.

Precincts:
P_32: Bundjalung National Park
P_34: Tabbimoble floodways
P_35: Tabbimoble State Forest
P_36: Tabbimoble Swamp Nature Reserve
P_37: New Italy
P_38: Rocky Mouth Creek and floodplain
P_39: Trustums Hill

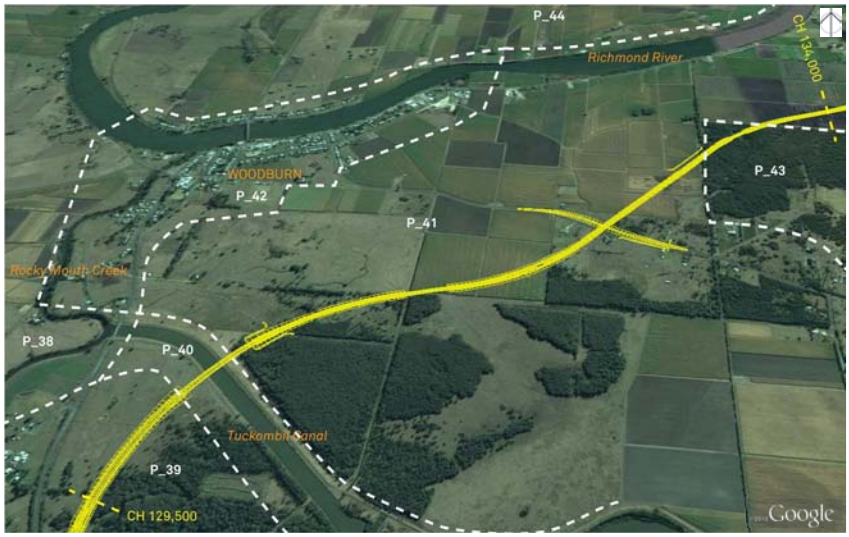
Table 11_ Section 7 landscape character impacts

Precinct	Magnitude	Sensitivity	Impact
P_32	**Low** Low embankments required up to 3 m.	**Low** A variety of landscape units with good absorption capacity.	**Low**
P_34	**Moderate** Low embankments required up to 3 m as well as bridge structures over the Tabbimoble floodways.	**Low** Upgrade of enclosed vegetated road corridor.	**Moderate-low**
P_35	**Low** Low embankments required up to 3 m within existing road corridor.	**Low** Upgrade of enclosed vegetated road corridor.	**Low**
P_36	**Low** Low embankments required up to 3 m within existing road corridor.	**Low** Upgrade of enclosed vegetated road corridor.	**Low**
P_37	**Low** Low embankments required up to 3 m within existing road corridor.	**Low** A variety of landscape units with good absorption capacity.	**Low**
P_38	**Low** Upgrade of existing road corridor.	**Low** A variety of landscape units with good absorption capacity.	**Low**
P_39	**Moderate** Some cuttings required up to 8.5 m deep.	**Low** A variety of landscape units with good absorption capacity.	**Moderate-Low**

02____Landscape character impacts

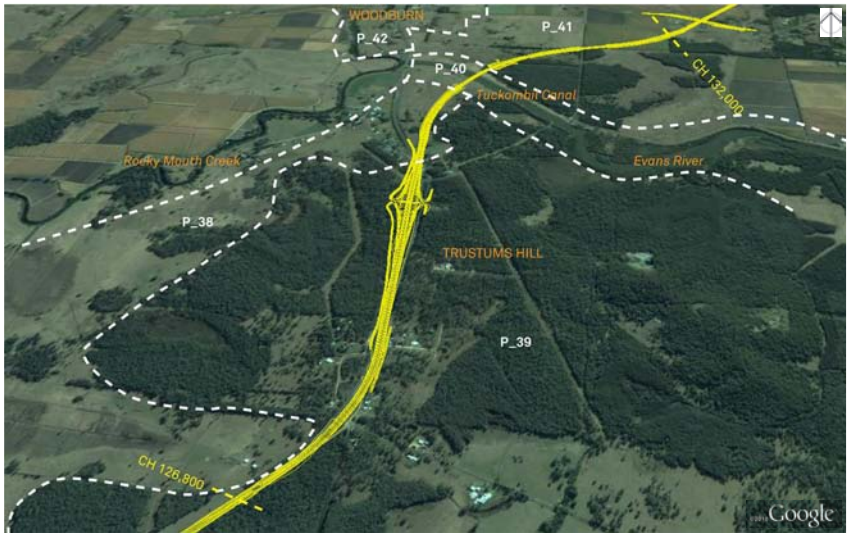


Chainage 133,200 - 137,600



Chainage 129,500 - 134,000

Section 8_ Trustums Hill to Broadwater National Park.



All base terrain images copyright Google, Digital Globe, 2010

Chainage 126,800 - 132,000

02____Landscape character impacts

2.6.9_ Section 08: Trustums Hill to Broadwater National Park CH126,400-137,600 (11.2 km)

Magnitude

Key bridges

There are a number of bridges within this section.

Tuckombil Canal bridges (350 m)

Bridge over Woodburn drain (200 m)

McDonalds Creek Bridge (small).

Key embankments

The road is generally in embankment within this section.

Key cuttings

Large area of cut at Lang Hill fro fill acquisition.

Precincts:
P_39: Trustums Hill
P_40: Tuckombil Canal
P_41: East Woodburn
P_42: Woodburn township
P_43: Broadwater National Park
P_44: South Richmond River and floodplain

Sensitivity

The upgrade would create a new road corridor through varied and highly modified landscapes. North of the Tuckombil Canal the new corridor would have an impact on the existing agricultural pattern. This section of road has limited vegetation and the road would be on an embankment.

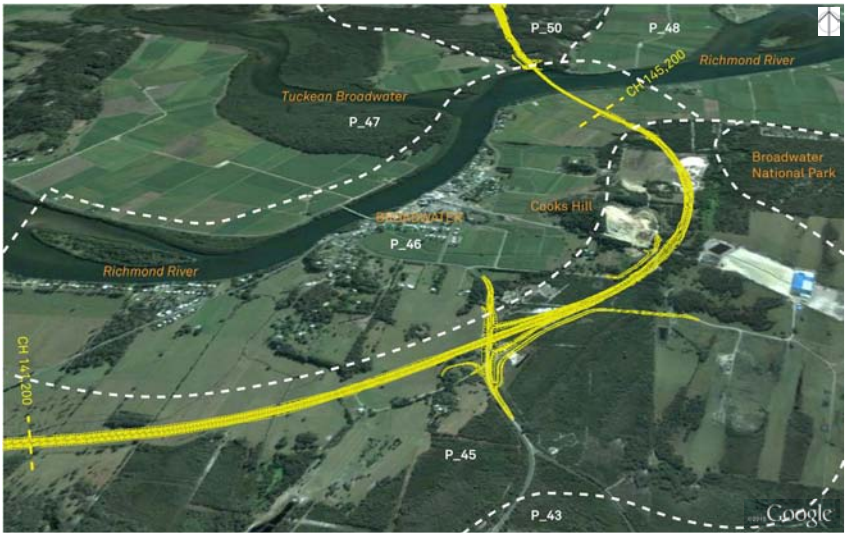
Impact: Moderate

Pockets of remnant vegetation within low lying areas provide areas of screening for the modification within the landscape.

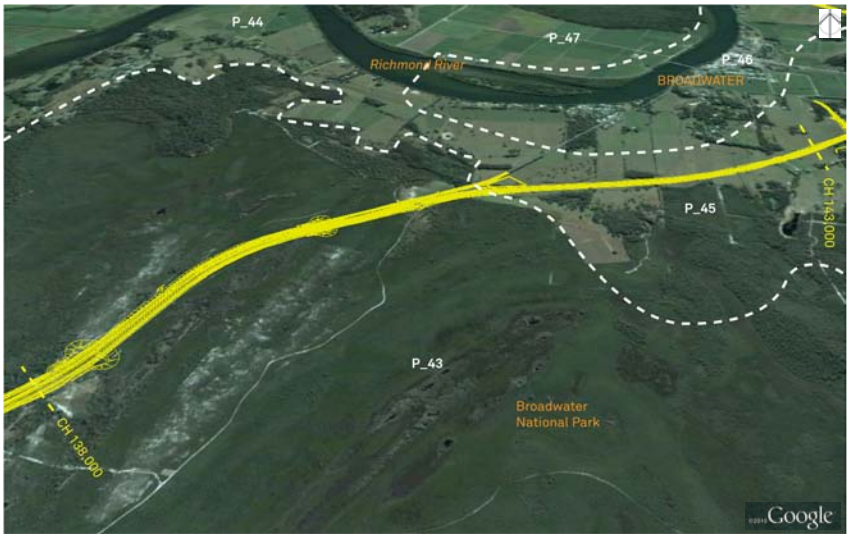
Table 12_ Section 8 landscape character impacts

Precinct	Magnitude	Sensitivity	Impact
P_39	**Moderate** Some cuttings required up to 8.5 m deep.	**Low** A variety of landscape units with good absorption capacity.	**Moderate-Low**
P_40	**Moderate** New bridge over Tuckombil Canal, new road alignment.	**Moderate-Low** Agricultural land, floodplain with some woodland. Good absorption capacity.	**Moderate**
P_41	**High-moderate** New road alignment. Low embankments within floodplain. Large area of cut around Lang Hill for fill acquisition.	**Moderate** Variable agricultural land, floodplain with some woodland. Good absorption capacity.	**Moderate**
P_42	**Negligible** P_42 (Woodburn) is outside the road corridor.	**Moderate** Reduced traffic volumes within Woodburn township.	**Negligible**
P_43	**Low** Road on small embankments within existing highway corridor.	**Moderate** Broadwater National Park woodland as well as cane fields. Wide existing road corridor .	**Moderate-Low**
P_44	**Low** Road on small embankments within existing highway corridor as well as a small area of new road alignment.	**Low** Variable agricultural land, floodplain with some woodland. Good absorption capacity.	**Low**

02____Landscape character impacts

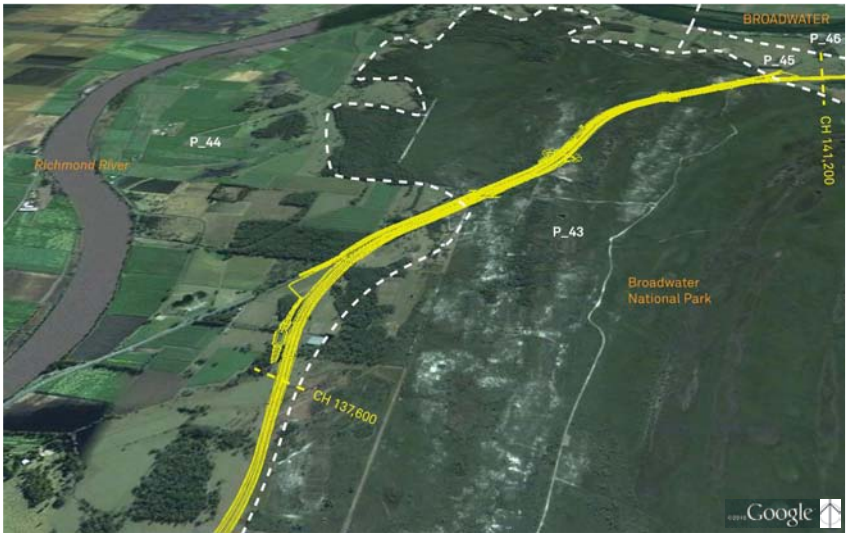


Chainage 141,000 - 145,200



Chainage 138,000 - 143,000

Section 9_ Broadwater National Park. to
Richmond River



Chainage 137,600 - 141,200

02____Landscape character impacts

2.6.10_ Section 9: Broadwater National Park to Richmond River CH137,600-145,100 (7.5 km)

Precincts:
P_43: Broadwater National Park and Surrounds
P_44: South Richmond River and floodplain
P_45: East Broadwater
P_46: Broadwater township
P_47: Tuckean Broadwater

Magnitude
Key bridges
Nil. (Richmond River bridge is covered in section 10).
Key embankments
Road is almost entirely on an embankment within this section. The embankment averages 2.4 m. The road follows the terrain with areas of embankment generally 1-2 m with some areas above 3 m.
Key cuttings
There is one area of cutting of approximately 1.1 m for 200 m. There are small areas of cut, max. 4 m, generally 1-3 m

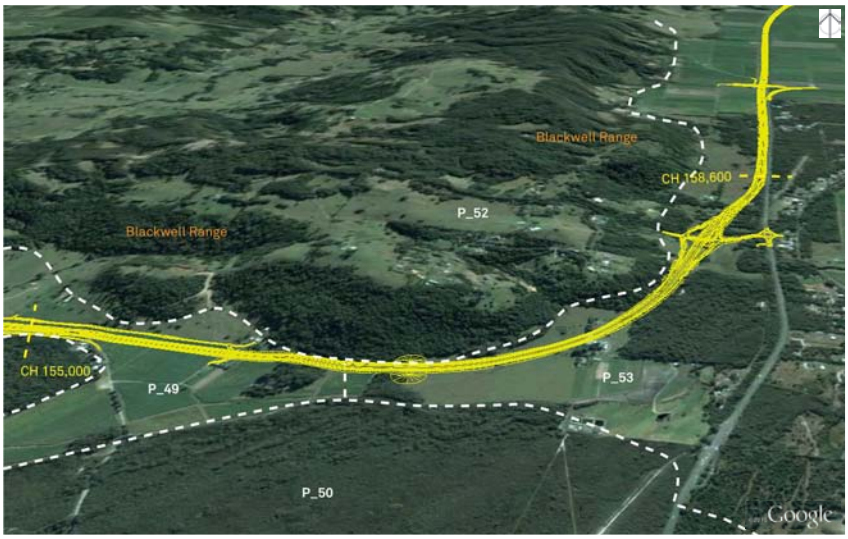
Sensitivity
Within the Broadwater National Park section, the project runs through the north west section of the park, minimising impact. The landscape contains areas of woodland capable of absorbing the new infrastructure.
The new road corridor would be largely hidden from the Broadwater township. There would be a new interchange at Broadwater Evans Head Road within an area of woodland with some cleared grazing areas. Impact on existing residential dwellings is limited. The roadside sugar cane is a mosaic of paddocks at differing stages of cultivation. Views from the existing highway, township and dwellings would change constantly.

Impact: Low
The project would be within the existing road corridor within this section of road. The road would cut through some cropping areas but generally it sits along the edges of woodland or is within woodland which creates screening to the township.

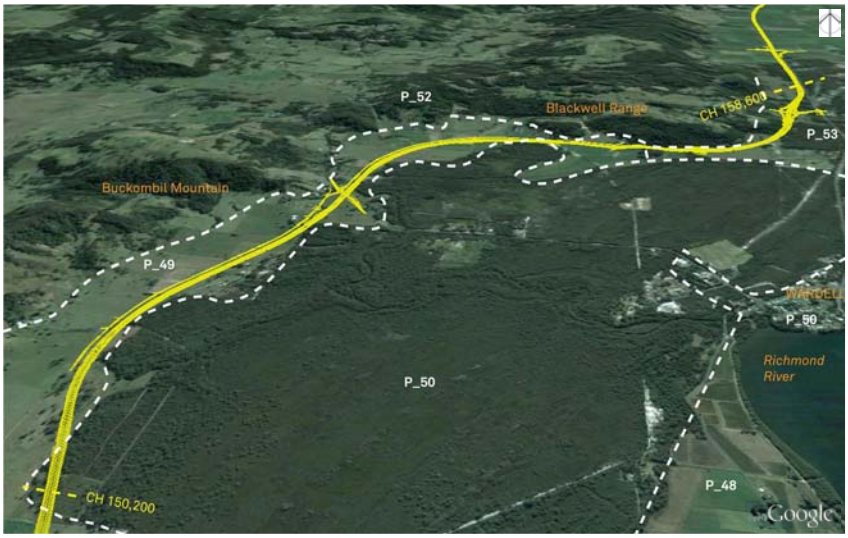
Table 13_ Section 9 landscape character impacts

Precinct	Magnitude	Sensitivity	Impact
P_43	**Low** Upgrade of existing corridor.	**Low** Mix of woodland, wetland, and pasture land with a wide existing road corridor.	**Moderate-Low**
P_44	**Low**	**Low**	**Low**
P_45	**Moderate**	**Moderate**	**Moderate**
P_46	**High** New road leading to the bridge across the Richmond River with associated embankments.	**High** Limited residences.	**High**
P_47	**Negligible** P_47 is outside the road corridor.	**Moderate**	**Negligible**

02____Landscape character impacts



Chainage 155,000 - 158,600



Chainage 150,200 - 158,600

Section 10_ Richmond River to Coolgardie Road

All base terrain images copyright Google, Digital Globe, 2010

Chainage 145,200 - 151,500

02____Landscape character impacts

2.6.11_ Section 10: Richmond River to Coolgardie Road, CH145,100-158,600 (13.5 km)

Magnitude

Key bridges

New bridge over the Richmond River
New overpass over Old Bagotville Road
New overpass over Wardell Road
Laws Access underpass
Coolgardie interchange bridge

Key embankments

The majority of the road within this stage is located on an embankment.
These embankments are generally uniform within a range of 1-3 m

Key cuttings

Moderate cuttings (7-8 m) north of the Richmond River bridge.
Smaller, short cuttings required intermittently.

Precincts:
P_46: Broadwater township
P_47: Tuckean Broadwater
P_48: Cabbage Tree Island and floodplain
P_49: Bagotville floodplain
P_50: Bingal Creek
P_51: Wardell township
P_52: Blackwall Range

Sensitivity

This is new road infrastructure within woodland, pasture and cropland. The road would interrupt the pattern of cropping in parts, but would in general follow the boundaries between cleared and forested areas.
A number of rural residential properties are located close to the new road near the Wardell Road overpass.

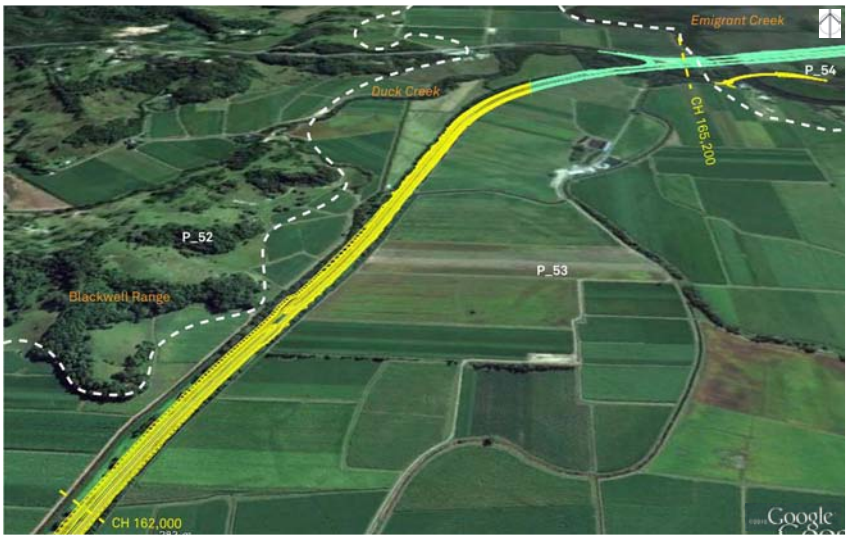
Impact: Moderate – high

While the road would pass through a variety of landscape types, and would generally skirt around the edges, this is new infrastructure within a scenic rural landscape with a visual impact on adjacent properties.

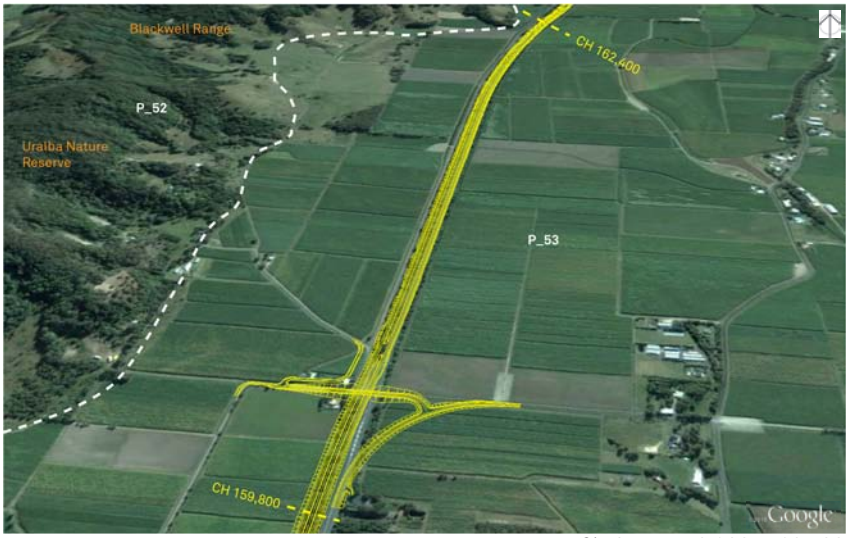
Table 14_ Section 10 landscape character impacts

Precinct	Magnitude	Sensitivity	Impact
P_46	**High** New bridge across the Richmond River with associated embankments.	**Moderate-High** Limited residences. Northern side of bridge located within high quality bush land.	**High**
P_47	**Negligible** P_47 is outside the road corridor.	**Moderate** Blackwall Range is of unique scenic quality.	**Negligible**
P_48	**Negligible** P_48 is outside the road corridor.	**Low** Area generally unaffected by the upgrade.	**Negligible**
P_49	**Moderate** Embankments generally between 1-3 m.	**Moderate** Open agricultural land. The road corridor generally follows edges between landscape character units.	**Moderate**
P_50	**Moderate-High** New road corridor on embankment between 1-3 m. Some areas of cutting.	**Moderate** Mixed woodland, forest and agricultural land. Has capacity to absorb new infrastructure. Road corridor generally follows edges between landscape character units.	**Moderate-High**
P_51	**Negligible** P_51 is outside the road corridor.	**Moderate** Wardell township would have reduced traffic volumes.	**Negligible**
P_52	**Negligible** P_52 is outside the road corridor.	**High** Blackwall Range is of unique scenic quality.	**Negligible**

02____Landscape character impacts

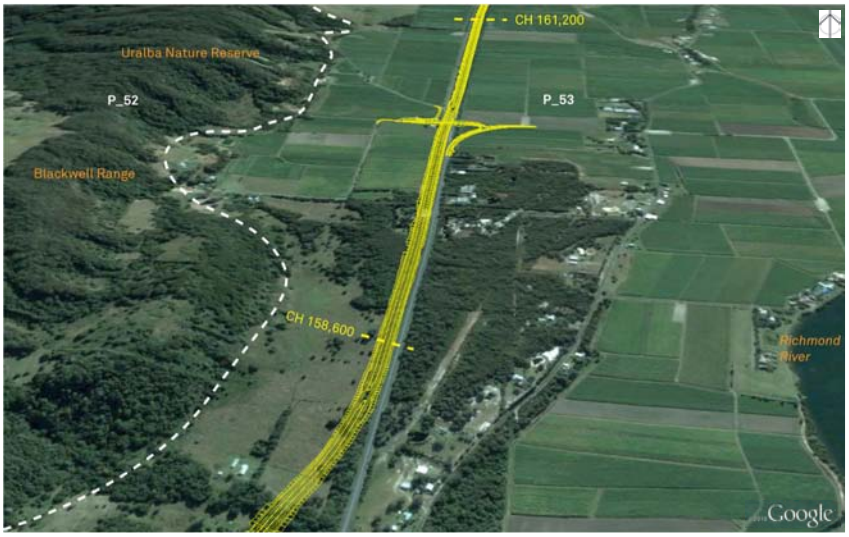


Chainage 162,000 - 165,200



Chainage 159,800 - 162,400

Section 11_ Coolgardie Road to Ballina Bypass



Chainage 159,600 - 161,200

All base terrain images copyright Google, Digital Globe, 2010

02____Landscape character impacts

2.6.12_ Section 11: Coolgardie Road to Ballina Bypass, 6.6 km CH158,600-163,900 (5.4 km)

Precincts:
P_52: Blackwall Range
P_53: Pimlico
P_54: Emigrant Creek

Magnitude
Key bridges
Whytes Lane overpass.
Key embankments
The road is generally on an embankment within this stage.
The embankments range between 1-2.5 m
Key cuttings
Nil

Sensitivity
Roadworks would widen the existing corridor. There are limited residences within this stage, which is predominantly sugarcane plantations with pockets of roadside vegetation.

Impact: Low
Sugarcane plantations adjacent to the road provide a constantly changing backdrop.

Table 15_ Section 11 landscape character impacts

Precinct	Magnitude	Sensitivity	Impact
P_52	**Negligible** P_52 is outside the road corridor.	**High** Blackwall Range is of unique scenic quality.	**Negligible**
P_53	**Moderate** Generally on embankment 1-2.5 m high. Bridge over Duck Creek.	**Moderate** Widening and elevating existing road corridor. Limited residences within sugarcane plantations.	**Moderate**

02____Landscape character assessment

2.6.13_ Overall landscape character assessment summary

Landscape character assessment determines the impact of a development on the aggregate of an area's built, natural and cultural character or sense of place. The project is a very large development passing through numerous landscape types on its 155 km journey between Woolgoolga and Ballina. The landscape character assessment identifies nine landscape character types in the study area and 54 character precinct areas illustrating the wide range of settings through which the project passes.

The majority of impact ratings across the project are in the low to moderate range, resulting primarily from the extent of the upgrade that occurs within or adjacent to the existing highway corridor, or where it runs through existing modified landscape settings. Six of the eleven sections are rated as low impact, four (including the Tyndale to Maclean Shark Creek option) are rated as moderate and two are rated as having a moderate–high impact.

Overall the Project can be considered to have a low to moderate overall landscape character impact, as the Project generally follows the existing highway corridor or travels through an existing modified landscape setting with a lower character impact. There are areas where the project will create a new road corridor and travel through undeveloped natural landscapes of floodplains and forested sections, where the overall impact is therefore considered as more moderate. A small number of moderate to high and high character impact locations are located throughout the Project, which form a low percentage of impacts throughout the entire Project. These locations occur at:
_Section 02: Cutting through Dirty Creek Range
_Section 03: Number of large bridge structures crossing the Coldstream River and floodplain
_Section 04: Cutting through Bondi Hill, near Tyndale
_Section 05: Bridge over Clarence River
_Section 10: Bridge over Richmond River
_Section 10: Alignment through Bingal Creek vegetated region

Table 16_ Overall landscape character impact summary

Section number	Location	Overall assessment
01	Woolgoolga to Halfway Creek	Moderate
02	Halfway Creek to Glenugie upgrade	Low
03	Glenugie upgrade to Tyndale	Moderate–high
04	Tyndale to Maclean	Moderate
05	Maclean to Iluka Road, Mororo	Moderate
06	Iluka Road to Devils Pulpit upgrade	Low
07	Devils Pulpit upgrade to Trustums Hill	Low
08	Trustums Hill to Broadwater National Park	Moderate
09	Broadwater National Park to Richmond River	Low
10	Richmond River to Coolgardie Road	Moderate–high
11	Coolgardie Road to Ballina bypass	Low