

Flora and Vegetation Assessment

Styx Coal
Yeats Consulting Engineers



Contents

Executive Summary.....	1
1 Introduction.....	2
1.1 Project Overview	2
1.2 Study Area.....	2
1.3 Objectives.....	2
2 Methods.....	3
2.1 Background Searches	3
2.2 Field Survey	3
2.2.1 Timing of Field Surveys.....	4
2.2.2 Field Survey Constraints	4
2.2.3 Site Selection	4
2.2.4 Field Survey Methods.....	4
2.3 Nomenclature.....	5
2.4 Coordinate System and Map Datum	5
3 Existing Environmental Values.....	7
3.1 Climate.....	7
3.2 Geology and Geomorphology	7
3.3 Soils.....	8
3.4 Desktop Assessment.....	10
3.4.1 Regional Ecosystems	10
3.4.2 Regulated Regrowth Vegetation	27
3.4.3 Threatened Ecological Communities	28
3.4.4 Essential Habitat.....	28
3.4.5 Threatened Species.....	28
<i>EPBC Protected Matters</i>	28
<i>Wildlife Online</i>	29
<i>HERBRECS Retrieval</i>	29
3.4.6 Marine Plants	32
3.4.7 Weeds	32
3.5 Field Survey Results.....	33
3.5.1 Vegetation Communities	33

3.5.2	Inaccuracies in Certified RE Mapping	38
3.5.3	Flora	38
3.5.4	Weeds	38
4	Environmentally Significant Areas	43
4.1	Ecological processes	43
4.2	Significant vegetation.....	43
5	References	44

Table Index

Table 1	Major geologies occurring in the study area.	7
Table 2	Major soils occurring in the study area.	8
Table 3	Land zones and associated geologies occurring in the study area.....	12
Table 4	Remnant REs mapped from EPC1029. Descriptions as per the Regional EcosystemDescription Database (Queensland Herbarium, 2011).	17
Table 5	Threatened flora previously recorded or predicted to occur within the study area ..	30
Table 6	Categories of declared plants in Queensland.....	33
Table 7	Summary of inconsistencies between site survey results and certified RE mapping.....	39

Figure Index

Figure 1	General location of EPC1029.....	6
Figure 2	Certified RE (v6.0b) and High Value Regrowth mapping covering the study area	14
Figure 3	Vegetation communities: Sedgeland on estuarine plain (left) and <i>Melaleuca leucadendra</i> and/or <i>Eucalyptus tereticornis</i> fringing open forest (right).....	34
Figure 4	Vegetation communities: <i>Eucalyptus tereticornis</i> / <i>Corymbia tessellaris</i> +/- <i>E. crebra</i> woodland on alluvial plains (left) and semi-evergreen vine thicket on alluvial soils (right)	35
Figure 5	Vegetation community: Brigalow (<i>Acacia harpophylla</i>) shrubby woodland remnant (left) and regrowth (right)	36
Figure 6	Mixed eucalypt woodland on clay plains (left) and <i>Corymbia intermedia</i> and/or <i>Eucalyptus crebra</i> , +/- <i>E. platyphylla</i> , +/- <i>E. exserta</i> , +/- <i>Melaleuca viridiflora</i> shrubby woodland (right)	37
Figure 7	<i>Eucalyptus crebra</i> and/or <i>Eucalyptus melanophloia</i> woodland with <i>Acacia rhodoxylon</i> (left) and <i>Eucalyptus crebra</i> , +/- <i>E. platyphylla</i> , +/- <i>E. populnea</i> grassy woodland (right)	38

Executive Summary

The Styx Coal Project is a joint venture project between Waratah Coal and Queensland Nickel. The project is currently planning small-scale open-cut coal extraction from a number of ore deposits within the area covered by Exploration Permit (Coal) 1029. EPC1029 is located approximately 140 km north of Rockhampton, central Queensland. Six potential extraction areas are proposed totalling some 34.6 km² in area. Associated with the open-cut areas are coal processing facilities and rail infrastructure. A baseline terrestrial vegetation and botanical assessment was undertaken to assess the ecological attributes and values of the environment within the EPC1029 area. This assessment included desktop analysis and literature review of existing information as well as a wet season field survey.

The wet season field survey was undertaken using methods that comply with the Department of Environment and Resource Management (DERM) guidelines for mapping Regional Ecosystems (RE) and vegetation communities, including CORVEG sampling, floristic surveys and random meander transects to verify the results of the desktop analysis.

Key Findings

The study area contains a mixture of vegetation communities that have low to high ecological value including eucalypt open forest, brigalow woodlands, sedgelands, and riparian communities as well as regrowth and cleared areas. A large proportion (approximately 74%) of the study area landscape has been historically cleared and converted to pasture. The condition of the remnant vegetation of the study area varies substantially according to historical land management practices including grazing.

Eighteen REs occur within the study area, comprising two REs classed as Endangered, four classed as Of Concern and the remainder classed as Least Concern under the provisions of the *Vegetation Management Act 1999* (VMA). Brigalow communities REs 11.3.1 and 11.4.9 are classed as Endangered under the VMA and are included in the description of the threatened ecological community Brigalow (*Acacia harpophylla* dominant and co-dominant) listed as endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). These REs are distributed across the study area as discreet, non-continuous patches. Approximately 11.8 ha of RE 11.4.9 occur within the proposed extraction areas. Advanced regrowth of brigalow has been mapped as High Value Regrowth containing Endangered RE. Approximately 28 ha of brigalow regrowth occur within the proposed extraction areas.

No conservation significant flora species were recorded during the field survey. However, one species (*Solanum elaeagnifolium*), listed as endangered under the *Nature Conservation Act 1992* (NCA), has the potential to occur in brigalow communities of the study area.

1 Introduction

1.1 Project Overview

Oberonia Botanical Assessment was engaged by Yeats Consulting Engineers to conduct a baseline botanical and terrestrial vegetation assessment of the area covered by Exploration Permit (Coal) 1029 herein referred to as the “study area”. The Styx Coal Project is a joint venture project between Waratah Coal and Queensland Nickel. The project is currently planning small-scale open-cut coal extraction from a number of ore deposits within the study area. Associated with the open-cut areas are coal processing facilities and rail infrastructure. This technical report provides a preliminary botanical assessment of the flora and vegetation communities located within the study area. The information contained within this technical report can be used to partly address the requirements of an Environmental Impact Statement (EIS) if one is required.

1.2 Study Area

The study area refers to the 342 km² area covered by Exploration Permit (Coal) (EPC) 1029 in the Styx Basin, central Queensland. EPC1029 falls between the population centres of Marlborough and Saint Lawrence and is approximately centred on the township of Ogmoo, approximately 140 km north-west of Rockhampton (Figure 1). The land use within the study area is predominantly pastoral in nature and associated with cattle grazing. The North Coast rail line and the Bruce Highway bisect the study area.

1.3 Objectives

The objectives of this study are to:

- Describe the flora values and vegetation communities from the area covered by EPC1029;
- Investigate, prepare and compile a description of the terrestrial flora and vegetation communities of the study area, including the compilation of records of threatened species listed under the Nature Conservation (Wildlife) Regulation 2006 (NCWR) and the Commonwealth’s *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- Identify the presence or likely presence of any threatened species or species’ habitats within the study area, their regional status and abundance and broad distribution patterns species;
- Identify populations of significant weed/pest species;
- Confirm the extent and attribution of the Department of Environment and Resource Management’s (DERM) remnant vegetation and certified Regional Ecosystems (RE) mapping within the study area; and
- Confirm the extent of DERM’s high value regrowth (HVR) mapped within the study area.

The approach in undertaking the botanical assessment included:

- Desktop assessment and literature review of available information relating to the flora and vegetation of the region; and
- Field survey to confirm and provide additional data to the desktop information collected.

The report is structured as follows:

- Section 2 - Description of the methods used to assess the existing environmental values;
- Section 3 - Description of existing environmental values of the study area; and
- Section 4 - Description of environmentally significant areas.

2 Methods

This section outlines the methods undertaken to describe the existing environmental values of the study area. A combination of desktop assessments and a wet season field survey were conducted as part of this study. The desktop assessments included a review of relevant literature and mapping, database searches and previously prepared technical reports. A wet season flora field survey was conducted to obtain specific ecological information relevant to the study area and to ground-truth results from desktop assessments. This section also outlines the terminology and nomenclature used in this technical report and describes the procedures and guidelines used for assessing the vegetation and flora values of the study area.

2.1 Background Searches

Desktop assessments of State and Commonwealth databases were undertaken prior to the commencement of the field survey to identify records or potential occurrences of conservation significant flora species and threatened ecological communities for the study area. The desktop assessment of the flora and vegetation of the study area utilised the following databases and literature sources:

- The Commonwealth Department of Sustainability, Environment, Water, Population and Communities Protected Matters search tool was used to identify species listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) that are predicted to occur within the search area. The Protected Matters search tool is a predictive database that identifies EPBC Act listed flora species that may occur in a given search area based on bioclimatic modelling.
- The Queensland Department of Environment and Resource Management (DERM) certified Regional Ecosystem (RE) mapping (Version 6.0b, 2009). This mapping database is administered by the DERM and identifies areas of mapped remnant vegetation and describes the REs within the study area. Additionally it outlines areas designated as essential habitat for endangered, vulnerable or near threatened species (both flora and fauna). This database was examined to determine the type and extent of REs present and whether any essential habitat is present;
- DERM's regulated regrowth vegetation mapping (version 2.0, 2009) to determine if any areas within the study area support high-value regrowth vegetation protected under the *Vegetation Management Act 1999*.
- DERM's Wildlife Online database provided a catalogue of flora species that have been historically recorded from or surrounding the study area. This database is derived from numerous sources including the DERM, consultants, academic facilities and community groups. Records were returned for a search area including a one kilometre buffer of the edge of the EPC 1029 area; and
- Queensland Herbarium HERBRECS specimen database to identify any previously recorded flora species located within the study area.

2.2 Field Survey

Field surveys were conducted to identify species and vegetation within the study area and to verify the certified RE and HVR mapping. Field surveys also aimed to determine the likelihood of occurrence of EPBC Act and/or NCA listed flora species or threatened ecological communities considered to have the potential to occur in the study area, as identified by desktop searches. Verification was based on direct observations of flora and vegetation, including soils, geology and landforms.

2.2.1 Timing of Field Surveys

Flora surveys were undertaken in the period between and inclusive of the 21st and 25th of March 2011. This period coincides with the optimal period for vegetative vigour and inflorescence set, particularly for herbaceous and grass species.

2.2.2 Field Survey Constraints

As a consequence of a prolonged and extensive wet season many sites within the study area were inaccessible. Field survey sites were largely confined to areas near gazetted roads or all-weather tracks with a few sites accessed by foot.

2.2.3 Site Selection

Flora surveys were undertaken in representative vegetation communities across the study area. Sites were selected on the basis of:

- Aerial photography interpretation of site characteristics;
- Presence of remnant vegetation;
- Verification of certified RE mapping extent and attribution;
- Verification of high-value regrowth mapping;
- Targeted threatened flora species and ecological communities and their habitats identified from database searches; and
- Location of the proposed coal extraction areas.

2.2.4 Field Survey Methods

Targeted floristic surveys were conducted using methods defined by the Queensland Herbarium (DERM) for mapping REs and vegetation communities (Neldner *et al.*, 2005). Flora surveys were conducted in areas of remnant vegetation including mapped REs and within high-value regrowth and non-remnant vegetation. Flora sampling methods included:

- CORVEG sampling (Neldner *et al.*, 2005);
- Site species lists; and
- Traverses.

CORVEG Sampling

A total of 31 sites were surveyed across the study area in verifying the extent and attribution of the certified RE and high-value regrowth mapping and to assist with determining remnant status. Sites were surveyed by a combination of secondary, tertiary or enhanced quaternary level CORVEG plots. The lower levels of sampling (tertiary and quaternary assessment) were performed to provide information relating to the vegetative structure and to assist in verifying the certified RE and high-value regrowth mapping within the study area. Flora survey site locations are shown in Figures 2a-c.

The remnant/non-remnant status of native vegetation is determined by comparing the existing predominant canopy of a site with that in a normal or undisturbed state. The predominant canopy is defined by the Queensland Herbarium as the ecologically dominant layer (EDL) or that layer of the vegetation which contains the most above ground biomass. The EDL can be defined in terms of growth form, height, cover density and species. In the majority of cases, the EDL is equivalent to the upper stratum of Walker and Hopkins (1990).

Site species lists

At each of the sampling sites, a comprehensive species inventory was prepared together with any ecologically significant characteristics, including the presence of threatened species or vegetation communities (or potential habitats) and threatening processes (such as significant weed infestations).

Plant species were either identified in situ or collected for later identification. For those species for which identification or confirmation was required, a specimen was sent to the Queensland Herbarium for verification.

Traverses

In addition to the CORVEG assessment sites, specific areas of vegetation in the study area were traversed on foot and the random meander technique (Cropper 1993) applied. The random meander technique is a widely accepted method to survey for threatened flora species that may not occur in surveyed plots. It involves traversing sections of the study area and recording vegetation type and vascular flora species along each traverse. The purpose of this type of assessment was to ensure adequate site coverage and to establish a comprehensive floral species list for the study area.

2.3 Nomenclature

Scientific names for terrestrial flora are consistent with those used in the Census of the Queensland Flora (Bostock and Holland, 2010) and botanical binomials presently accepted by the Queensland Herbarium, DERM. An asterisk (*) preceding a species name indicates a non-native exotic species and a plus sign (+) indicates a non-indigenous native species. The description of REs follows that of the Regional Ecosystem Description Database (REDD, Version 6.0b (Queensland Herbarium, 2011)).

2.4 Coordinate System and Map Datum

Positional data was collected with a handheld Garmin eTrex Geographic Positioning System (GPS), with accuracy between 4 and 8 m. Locations were recorded using the UTM coordinate system with a GDA94 datum. All locations presented in this report are within zone 55K.

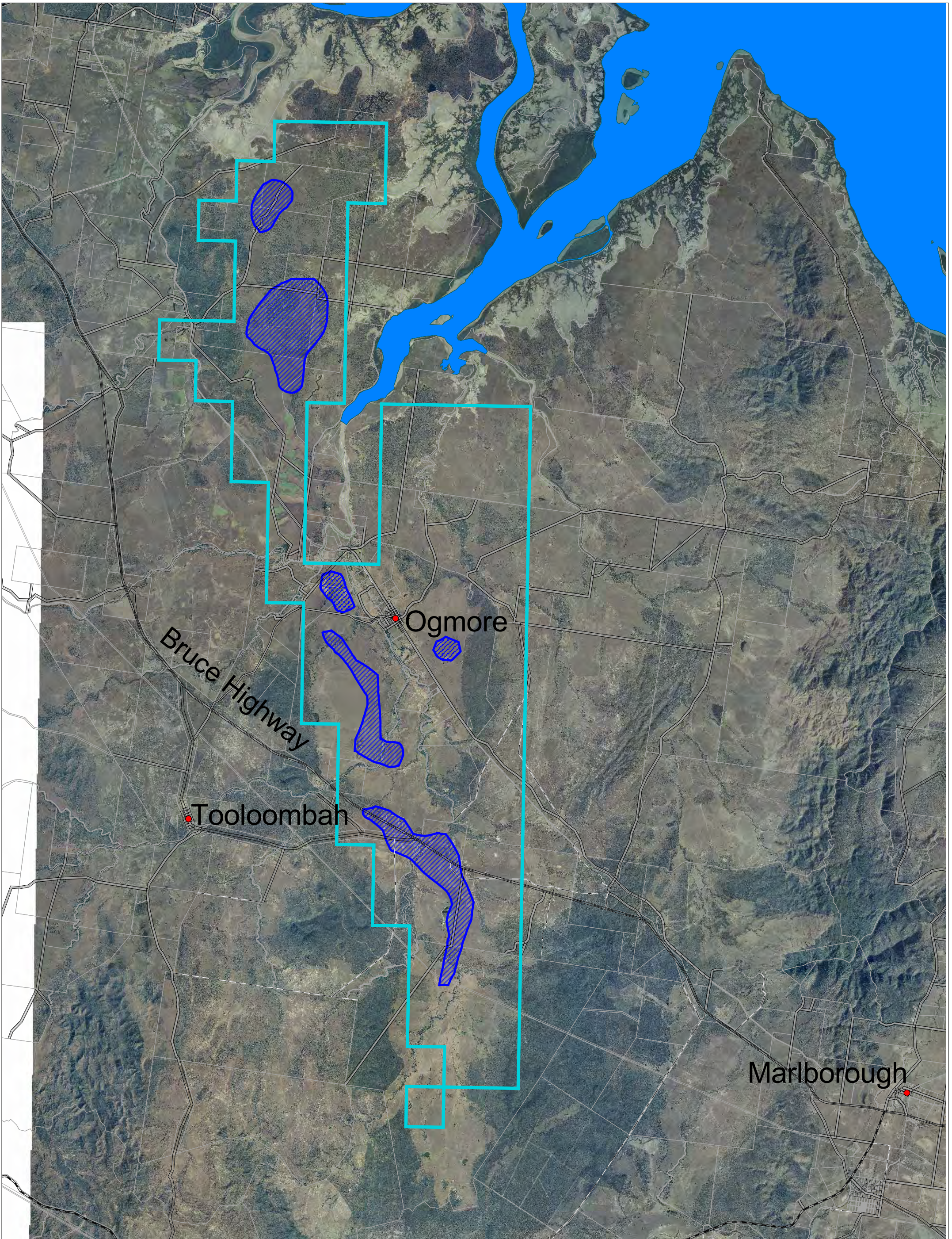
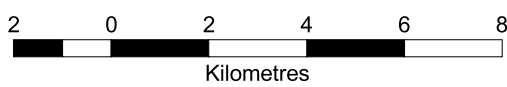


Figure 1
Location of EPC1029

Styx Coal Project
Flora and Vegetation Survey



Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 55

Legend

- Town
- Extraction Areas
- EPC1029

3 Existing Environmental Values

The study area falls between the population centres of Marlborough and Saint Lawrence and is centred on the township of Ogmoo, approximately 140 km north-west of Rockhampton. The study area falls in both the Rockhampton and Isaac Regional Council local government areas. Six potential extraction areas are proposed totalling some 34.6 km² in area.

3.1 Climate

The climate of the general area can be described as dry tropical. The study area generally falls between the 800 mm and 1000 mm rainfall isohyets. Climate records for the closest Bureau of Meteorology station to the study area (St Lawrence Post Office – 33065) indicates a mean annual rainfall of 1016.7 mm, 83% of which falls in the summer half year of October through to March.

3.2 Geology and Geomorphology

Geology mapping covering the EPC1029 area (Marlborough and St Lawrence 1:100,000 sheets) indicates that eleven distinct geologies occur across the study area (Table 1).

Table 1 Major geologies occurring in the study area.

Map Code	Age	Description	Area (ha)
Qa	Quaternary	Alluvium comprising clay, silt, sand and gravel, floodplain alluvium associated with active stream channels and terraces	7748.58
Qr,Qf>Kx	Quaternary	Clay, silt, sand, gravel and soil: colluvial and residual deposits	398.37
Qhe/m	Holocene	Mud, sandy mud, muddy sand and minor gravel on estuarine channels and banks, supratidal flats and coastal grasslands	1037.48
Qhe/s	Holocene	Sand, muddy sand, mud and minor gravel; estuarine channels and intertidal sand banks and flats	58.76
Qpa	Pleistocene	Clay, silt, sand and gravel, floodplain alluvium on high terraces	12223.18
TQr>Kx	Late Tertiary – Quaternary	Clay, silt, sand, gravel and soil; colluvial and residual deposits (generally on older land surfaces)	4860.9
Ta	Tertiary	White to buff, sandy claystone, poorly sorted, clayey labile sandstone, local unsorted granule to boulder gravel beds; deeply weathered with ferruginous zones; old alluvium and minor colluvial deposits; locally some interbedded basalt	300.21
Td	Tertiary	Duricrusted palaeosols at the top of deep weathering profiles, including ferricrete and silcrete; duricrusted old land surfaces	100.14

Map Code	Age	Description	Area (ha)
Kx	Early Cretaceous	Quartzose sandstone, green lithic sandstone, mudstone, conglomerate, carbonaceous shale and coal (Styx Coal Measures)	2414.59
Pb	Late Permian	Predominantly massive, cleaved mudstone and siltstone (commonly with concretions), minor lithic sandstone (Back Creek Group)	4416.72
Pbm	Late Permian	Lithic sandstone, siltstone, mudstone, rare conglomerate (Boomer Formation)	633.28

The landform across the study area can be described as gently undulating. Elevation across the study area ranges from approximate 3 m to 120 m. Mount Bison and Mount Mamelon occur towards the southwest corner of the study area.

The study area falls entirely in the Styx River catchment. The major watercourses of Barrack Creek, Bridge Creek, Brumby Creek, Brussels Creek, Deep Creek, Granite Creek, Montrose Creek, Stockyard Creek, Stoodleigh Creek, Tooloombah Creek, and the Styx River are all prominent riparian features in the landscape of the study area and provide the only other marked change in the land surface profile other than the areas identified above.

3.3 Soils

Soils derived from the above geology reflect the complexity of the parent material and the low topographical relief has allowed the development of extensive soils formed from sediments and alluviums overlying the base geology. With the exception of small areas of the study area associated with the foothills of Mount Bison and Mount Mamelon the soils derived from sediments and alluvium are the dominant soils across the study area. The Commonwealth Scientific and Industrial Research Organisation (CSIRO) Australian Soil and Resources Information System (CSIRO Land and Water, 2009) has mapped the dominant sediments and alluvium as a complex combination of Sodosols, Vertosols and Kandosols. These soil types are generally considered to be imperfectly drained, often of clay, and are associated with floodplains, areas of alluvium near rivers/creeks and flat to very gently undulating topography. Major soil types occurring in the study area based on CSIRO soils mapping prepared at 1:2,000,000 scale are listed in Table 2.

Water may persist in the landscape for a significant period after rainfall owing to the flat to gently undulating topography. As a result of this ponding and the particular characteristics of certain soils (cracking clay soils) gilgai (or 'melon holes') may form. Gilgai is the name given to the small water bodies formed as a result of certain clay soil types swelling and shrinking creating depressions and mounds in these locations. Recurrent clearing of brigalow regrowth and disturbance of the soil profile exaggerates the cycle and gilgai across the study area were found to vary significantly in diameter and depth. The majority of the gilgai formations in the study area is on soils characterised as cracking clays (primarily Vertosols) and are highly elastic in nature with extensive shrinkage and expansive characteristics that vary with moisture content.

Table 2 Major soils occurring in the study area.

Soil Map Unit	Description and General Characteristics	Area (ha)
CC32	Gently undulating or level plains, often with slight to moderate gilgai	9678.3

Soil Map Unit	Description and General Characteristics	Area (ha)
	microrelief: dominant soils are deep grey clays (Ug5.24 and Ug5.25) with lesser deep brown clays (Ug5.34). Closely associated are fairly extensive areas of loamy duplex soils, chiefly (Dy2.33). Other soils occurring include friable brown clays (Uf6.34).	
Mw26	Strongly undulating lands with some high narrow ridges, low dissected mesas, and steep-scarped low cuestas: dominant soils are deep sandy red earths (Gn2.14) that are occasionally gravelly. On higher more dissected landscape sites are shallow stony loams (Um1.43), and lower flatter slopes mostly have deep sandy-surfaced duplex soils (Dy3.42) and (Dy5.42).	1996.6
NN2	Level alluvial marine plains adjacent to tidal flats; the unit may be inundated for short periods by flood waters and partly by very high tides: dominant soils are massive heavy clays (Ug5.4) with closely associated (Ug5.5), (Uf6.41), (Uf6.42), (Uf6.32), and (Uf6.33); thin-surfaced loamy duplex soils (Dd2.13) and (Dd2.33); and similar (Dd1) and (Dy2) soils. Small areas of self-mulching clays (Ug5.16) and (Ug5.24) occur in lower sites and in slight gilgai depressions. At their coastal margins the marine plains merge into salt pans with (Uf6.61) and other undescribed saline soils. These also occur adjacent to the many small tidal channels that dissect the marine plains. At the inland margins the unit grades to loamy duplex soils (Dy3.43).	1234.1
Sh1	Moderate to gently undulating lands with some small level gilgaied plains: dominant are sandy to loamy duplex soils with moderately deep A horizons overlying grey clay (Dy2.32). Closely associated are small level plains with grey and brown clays (Ug5.24), (Ug5.25), and (Ug5.34) that are moderately to strongly gilgaied. Also occurring are small levees adjacent to drainage lines with sandy earth soils (Gn2.14), (Gn2.42), and (Gn2.45).	1930.6
Ub86	Undulating lands with some isolated low hilly areas: dominant are loamy or occasionally sandy duplex soils of moderate to shallow depth; on higher landscape sites the soils are usually stony. The chief form is (Dy3.42) with (Dy3.41) and less often (Dy3.43), (Dy3.33), and (Dy3.32). Similar (Dy2) soils are associated and on the low hills are shallow stony loams (Um1.42) and (Um2.12).	63.9
Ub89	Moderate to strongly undulating lands with occasional low hilly areas: dominant are shallow loamy duplex soils (Dy3.42) and (Dy3.32) but with (Dy3.43), (Dy3.33), and similar (Dy2) soils also common. A prominent gravelly stone line is often present at the base of the A horizons. Higher ridges and low hilly areas have very shallow stony similar duplex soils and also some occurrences of (Dr2.12), (Db1.12), (Db1.22), (Um1.43), and (Um2.12).	5935.2
Va47	Level or very gently undulating alluvial plains rising slowly to undulating low foothills: dominant soils have fine sandy or loamy A horizons overlying strongly mottled clay (Dy3.43). Closely associated are (Dy3.42 and Dy3.41) and (Dy3.33 and Dy3.32). Similar (Dy2) soils may also occur. The surface of lower swampy areas has a	6153.5

Soil Map Unit	Description and General Characteristics	Area (ha)
Vd3	<p data-bbox="336 253 1166 528">prominent irregular trench gilgai microrelief. Slightly higher old stream levees traversing the plains have coarser-textured gradational soils (Gn3.24), (Gn2.44), and (Gn2.71) or occasional brown duplex soils (Db1.22). On the undulating marginal foothills shallow often stony loamy duplex soils occur, chiefly (Dy3.42 and Dy3.41). Where the unit is adjacent to the coast the (Dy3) soils merge into salt pans (eroded (Dy3.43) soils), mangrove swamps, or less commonly marine plains (unit NN2).</p> <p data-bbox="336 562 1166 763">Gently undulating slightly elevated plains with a slight gilgai microrelief: dominant soils have loamy A horizons. The chief form is (Dy3.33), rarely (Dy3.43). These duplex soils occur on level sites, most puffs, and all depressions; in the latter, A horizons are at the deep end of the range. Occasionally on some better-defined puffs grey clays (Ug5.24) occur.</p>	8200.0

3.4 Desktop Assessment

3.4.1 Regional Ecosystems

In Queensland, remnant vegetation is classified into Regional Ecosystems (REs). REs are discrete vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil. Each RE has a number that serves as a shorthand description of its characteristics and locations, for example, RE 11.3.25. The first number, 11, indicates the bioregion which the RE is located within, in this case the Brigalow Belt bioregion. The second number, 3, indicates the land zone on which the ecosystem is found, in this case . The third number, 25, is the ecosystem number and relates to the dominant vegetation, in this case .

The Queensland Herbarium, which is part of the DERM, is responsible for mapping REs, using a combination of remotely sensed data sets and on-ground studies. Each RE is assigned a vegetation management class, which is based on its areal extent (how much of it remains) within a bioregion. RE class definitions are set out in the *Vegetation Management Act 1999* and are defined as follows:

- Endangered:
 - If less than 10% of the pre-clearing extent remains; or
 - If 10-30% of the pre-clearing extent remains (if the remnant extent of the RE within the bioregion is less than 10,000 ha).
- Of Concern:
 - If 10-30% of the pre-clearing extent remains; or
 - More than 30% of the pre-clearing extent remains (if the extent of the RE within the bioregion is less than 10,000 ha).
- Least Concern:
 - If more than 30% of the pre-clearing extent remains; and,
 - If the remnant extent of the RE within the bioregion is more than 10,000 ha.

Furthermore, the DERM assigns a non-legislative biodiversity status to REs according to the condition of the RE and its perceived threats, in addition to its pre-clearing and remnant extent. Under this process a RE is:

- Endangered if it has:
 - – less than 10% of the pre-clearing extent unaffected by severe degradation and/or biodiversity loss¹; or
 - – 10 - 30% of the pre-clearing extent unaffected by severe degradation and/or biodiversity loss and the remnant vegetation is less than 10 000 hectares; or,
 - – a rare² RE subject to a threatening process³.
- Of Concern if it has:
 - – 10 - 30% of the pre-clearing extent unaffected by moderate degradation⁴ and/or biodiversity loss.
- No Concern at Present if it:
 - – does not meet the degradation criteria listed for Endangered and Of Concern REs.

Remnant vegetation is defined in the *Vegetation Management Act 1999* as vegetation shown on a Regional Ecosystem or remnant map. Woody vegetation is mapped as remnant where the dominant canopy has:

- >50% of the predominant canopy cover that would exist if the vegetation community were undisturbed; and
- >70% of the height of the predominant canopy that would exist if the vegetation community were undisturbed; and
- composed of the same floristic species that would exist if the vegetation community were undisturbed.

This definition is known as the '50-70-species rule'.

Bioregion and Subregion

The study area occurs within the Brigalow Belt bioregion. The Brigalow Belt bioregion covers a total area of 135,500 km² and includes coastal areas, rugged ranges and alluvial plains. Dominant vegetation communities include open forests (dominated by *Acacia harpophylla*, *A. argyrodendron*, *A. cambagei*, *A. shirleyi*, *A. catenulata*, *Eucalyptus cambageana*, *E. camaldulensis*, *E. tereticornis*), woodlands (dominated by *Eucalyptus melanophloia*, *E. crebra*, *E. populnea*, *E. brownii*, *E. persistens*, *E. orgadophila*, *E. coolabah*, *E. camaldulensis*, *E. tereticornis*) and small patches of semi-evergreen vine thicket (Young *et al.*, 1999).

The Brigalow Belt bioregion supports a range of flora and fauna including a number of threatened species. Regional biodiversity within the Brigalow Belt bioregion is under threat from continued land clearing for grazing, dryland agriculture and mining. Broadscale clearing is particularly pronounced in lowland landscapes, and those formed on shales, while the more rugged topography associated with the sandstone and metamorphic ranges is relatively undisturbed (Young *et al.*, 1999).

The majority of the study area occurs in the Marlborough Plains subregion (BRB14) of the Brigalow Belt bioregion. To a lesser extent and towards the southern part of the EPC1029 area, the study area falls in the Nebo-Connors Ranges (BRB12) and the Boomer Range (BRB17) subregions. The

¹ Floristic and/or faunal diversity is greatly reduced but unlikely to recover within the next 50 years even with the removal of threatening processes; or soil surface is severely degraded, for example by loss of A horizon, surface expression of salinity, surface compaction, loss of organic matter or sheet erosion

² Pre-clear extent less than 1000 ha or patch size 100 ha and of limited extent across its range

³ For example, clearing, weed invasion, fragmentation, inappropriate fire regime or grazing, or infrastructure development

⁴ Floristic and/or faunal diversity is greatly reduced but unlikely to recover within the next 20 years even with the removal of threatening processes; or soil surface is moderately degraded

Marlborough Plains subregion is a characteristically undulating to hilly subregion with a complex geology. The subregion is dominated by alluvial plains and colluvial slopes, usually supporting woodlands characterised by poplar gum (*Eucalyptus platyphylla*), ghost gum (*Corymbia dallachiana*), forest red gum (*Eucalyptus tereticornis*) and tea-tree (*Melaleuca* spp.) with low rises supporting narrow-leaved ironbark (*Eucalyptus crebra*). There are also extensive saline coastal littoral communities (Young *et al.*, 1999).

Land Zones

Land zones represent significant differences in geology and the associated landforms, soils and physical processes and generally correspond to broad geological and geomorphological categories. Seven land zones (Table 3) are mapped from the study and are broadly consistent with the geology mapping.

Table 3 Land zones and associated geologies occurring in the study area.

Land zone	Description	Associated geology
1	Quaternary estuarine and marine deposits subject to periodic inundation by saline or brackish marine waters. Includes mangroves, saltpans, off-shore tidal flats and tidal beaches. Soils are predominantly Hydrosols (saline muds, clays and sands) or beach sand	Qhe/m, Qhe/s
3	Quaternary alluvial systems, including floodplains, alluvial plains, alluvial fans, terraces, levees, swamps, channels, closed depressions and fine textured palaeo-estuarine deposits. Also includes estuarine plains currently under fresh water influence, inland lakes and associated dune systems (lunettes). Excludes talus slopes, colluvial deposits and pediments. Includes a diverse range of soils, predominantly Vertosols and Sodosols, also with Hydrosols in higher rainfall areas.	Qa
4	Cainozoic clay deposits, usually forming level to gently undulating plains above current alluvial systems. Excludes clay plains and downs formed in-situ on bedrock. Mainly Vertosols with gilgai microrelief, but includes small areas of thin sandy or loamy surfaced Sodosols and Chromosols.	Qpa
5	Extensive, uniform near level or gently undulating Cainozoic plains with sandy or loamy soils. Includes dissected remnants of these surfaces. Also includes plains with sandy or loamy soils of uncertain origin, and plateau remnants with deep soils usually overlying duricrust. Excludes Quaternary alluvial deposits (land zone 3), exposed duricrust (land zone 7), and soils derived from underlying bedrock (land zones 8 to 12). Soils are usually Tenosols and Kandosols, also minor deep sandy surfaced Sodosols and Chromosols. There may be a duricrust at depth.	TQr>Kx, Ta, Td
7	Cainozoic duricrusts formed on a variety of rock types, usually forming mesas or scarps. Includes exposed ferruginous, siliceous or mottled horizons and associated talus and colluvium, and remnants of these features, for example low stony rises on downs.	Ta, Td

Land zone	Description	Associated geology
	Soils are usually shallow Rudosols and Tenosols, with minor Sodosols and Chromosols on associated pediments, and shallow Kandosols on plateau margins and larger mesas.	
10	Medium to coarse-grained sedimentary rocks, with little or no deformation, forming plateaus, ledges and scarps. Includes siliceous sandstones, conglomerates and minor interbedded volcanics, and springs associated with these rocks. Excludes overlying Cainozoic sand deposits (land zone 5). Soils are predominantly shallow Rudosols and Tenosols of low fertility, but include sandy surfaced Kandosols, Kurosols, Sodosols and Chromosols.	Kx
11	Metamorphosed rocks, forming ranges, hills and lowlands. Primarily lower Permian and older sedimentary formations which are generally moderately to strongly deformed. Includes low- to high-grade and contact metamorphics such as phyllites, slates, gneisses of indeterminate origin and serpentinite, and interbedded volcanics. Soils are mainly shallow, gravelly Rudosols and Tenosols, with Sodosols and Chromosols on lower slopes and gently undulating areas. Soils are typically of low to moderate fertility.	Pb, Pbm

Regional Ecosystems

The certified Regional Ecosystem (RE) mapping (Version 6.0b) was obtained for the study area (Appendix A). The remnant REs present in the study area are described in Table 4 with a comparison of their remnant (as of 2006) and pre-clearing extent. Version 6.0b of the certified RE mapping has approximately 89.4 km² of remnant vegetation of 18 REs mapped across the study area. Figures 2a-c illustrate the extent of the certified RE mapping within the study area (areas of RE mapped outside the study area are not shown on these figures but are indicated in the extract of the certified RE mapping appearing in Appendix A).

Of the 18 mapped REs, two have been classed as Endangered, four have been classed as Of Concern and the remainder are classed as Least Concern under the provisions of the VMA. Biodiversity status is assessed by DERM when considering development applications to clear vegetation. It is not a regulatory status in its own right, unless the biodiversity status includes Essential Habitat for specific threatened fauna/flora species.

Approximately 694.7 ha of mapped remnant vegetation occur within the proposed extraction areas. This includes 66.8 ha of 11.1.2 (VMA Class: Least Concern), 47 ha of 11.3.25 (VMA Class: Least Concern), 569 ha of 11.4.2 (VMA Class: Of Concern) and 11.8 ha of 11.4.9 (VMA Class: Endangered).

Based on or contains data provided by the State of Queensland (Department of Environment and Resource Management) 2011. In consideration of the State permitting use of this data, you acknowledge and agree that the State gives no warranty in relation to the data (including accuracy, reliability, completeness, currency or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data. Data must not be used for direct marketing or be used in breach of the privacy laws.

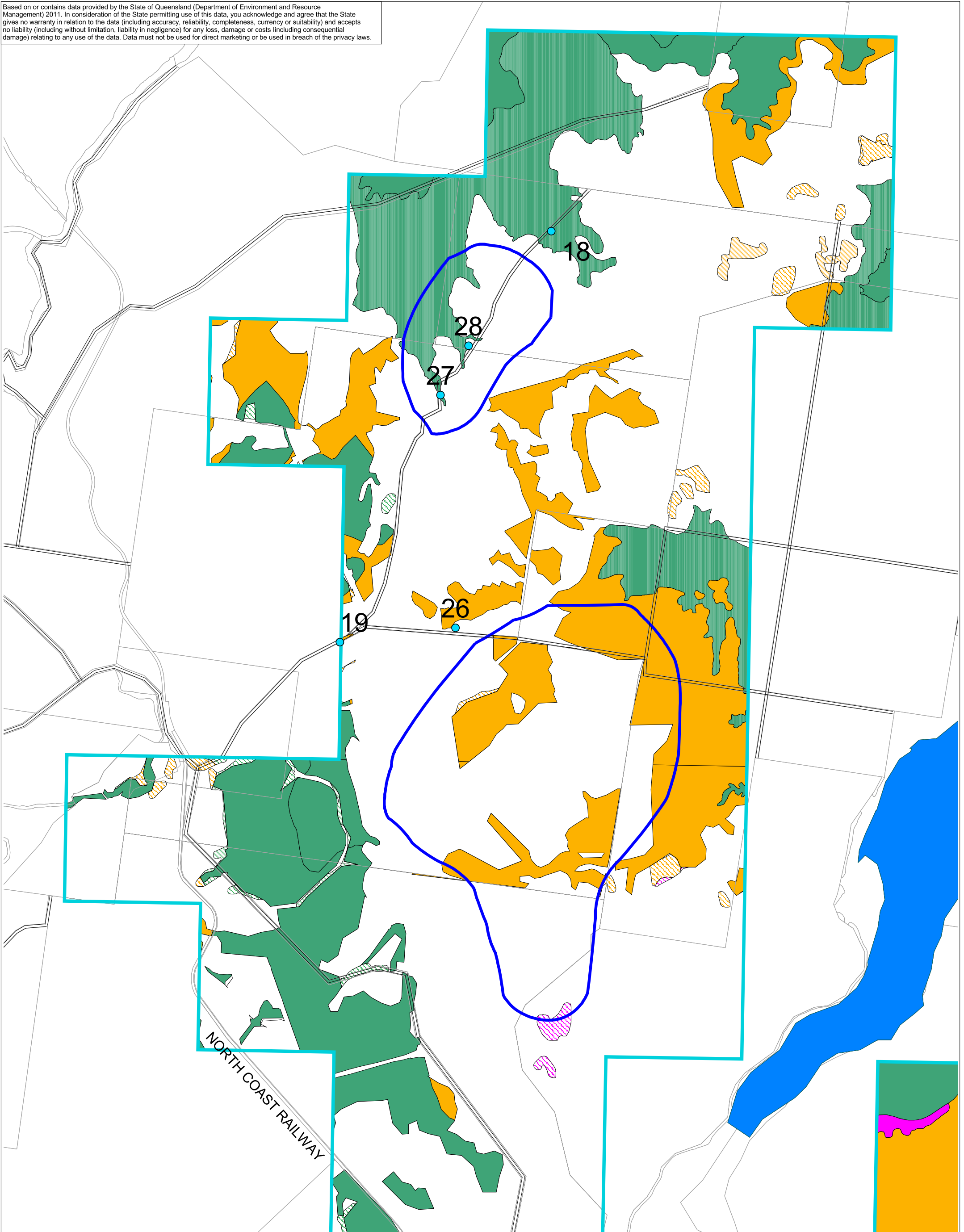


Figure 2a RE (v6.0b) & HVR (v2.0) Northern Section

Styx Coal Project
Flora and Vegetation Survey



500 0 500 1000 1500 2000
Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 55

Legend

- | | | | |
|--|---------------------------|--|-----------------------|
| | Sites | | Is a Least Concern RE |
| | EPC1029 | | RE (v6.0b) |
| | Extraction Area | | Endangered (dom) |
| | Cadastre | | Endangered (subdom) |
| | HVR (v2.0) | | Of Concern (dom) |
| | Containing Endangered REs | | Of Concern (subdom) |
| | Containing Of Concern REs | | Least Concern |



Based on or contains data provided by the State of Queensland (Department of Environment and Resource Management) 2011. In consideration of the State permitting use of this data, you acknowledge and agree that the State gives no warranty in relation to the data (including accuracy, reliability, completeness, currency or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data. Data must not be used for direct marketing or be used in breach of the privacy laws.

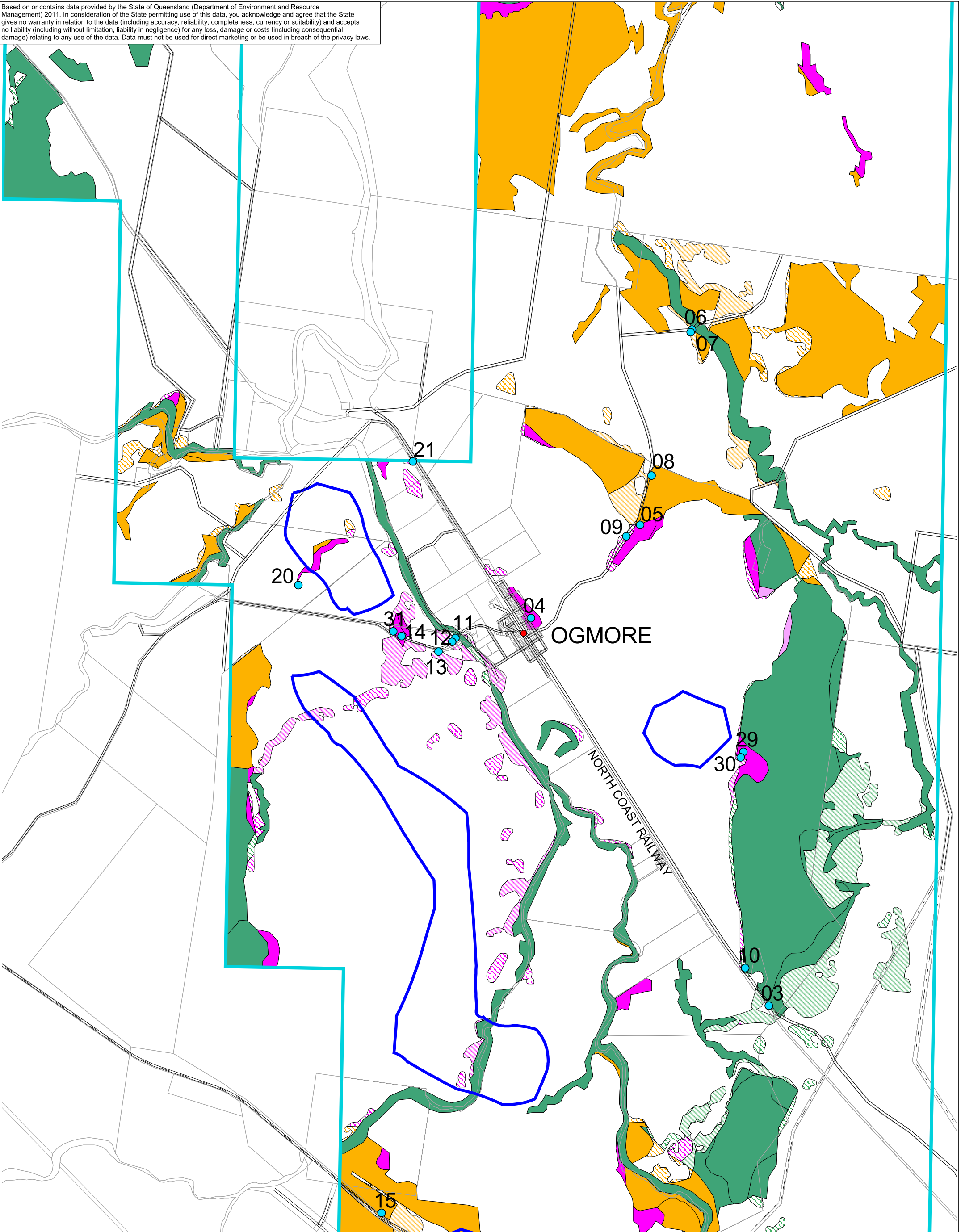


Figure 2b
RE (v6.0b) & HVR (v2.0)
Central Section

Styx Coal Project
 Flora and Vegetation Survey



Map Projection: Transverse Mercator
 Horizontal Datum: Geocentric Datum of Australia 1994
 Grid: Map Grid of Australia, Zone 55

Legend

- | | |
|---------------------------|-----------------------|
| Sites | Is a Least Concern RE |
| EPC1029 | RE (v6.0b) |
| Extraction Area | Endangered (dom) |
| Cadastre | Endangered (subdom) |
| HVR (v2.0) | Of Concern (dom) |
| Containing Endangered REs | Of Concern (subdom) |
| Containing Of Concern REs | Least Concern |



Based on or contains data provided by the State of Queensland (Department of Environment and Resource Management) 2011. In consideration of the State permitting use of this data, you acknowledge and agree that the State gives no warranty in relation to the data (including accuracy, reliability, completeness, currency or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data. Data must not be used for direct marketing or be used in breach of the privacy laws.

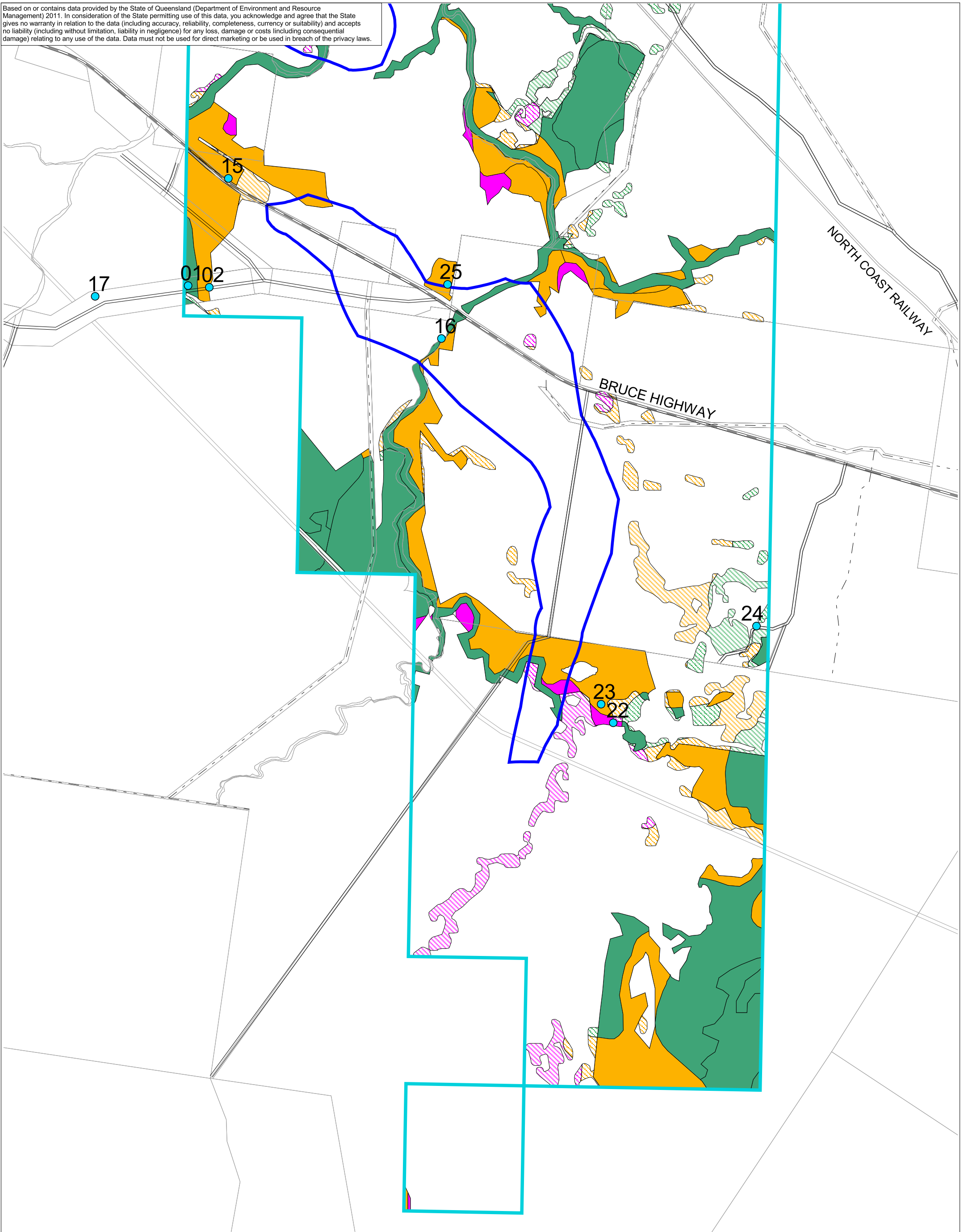


Figure 2c RE (v6.0b) & HVR (v2.0) Southern Section













Styx Coal Project
Flora and Vegetation Survey



1000 0 1000 2000
Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 55

Legend

- | | | | |
|---|---|---|-----------------------|
|  | Sites |  | Is a Least Concern RE |
|  | EPC1029 |  | Endangered (dom) |
|  | Extraction Area |  | Endangered (subdom) |
|  | Cadastral |  | Of Concern (dom) |
|  | HVR (v2.0)
Containing Endangered REs |  | Of Concern (subdom) |
|  | Containing Of Concern REs |  | Least Concern |



OBERONIA
Botanical Services

Table 4 Remnant REs mapped from EPC1029. Descriptions as per the Regional Ecosystem Description Database (Queensland Herbarium, 2011).

Mapped RE	RE	Description	VMA Class	Biodiversity Status	Pre-clear Extent (ha)	2006 Extent (ha)
11.1.2/11.1.1	11.1.2	Samphire forbland or bare mud-flats on Quaternary estuarine deposits. Mainly salt pans and mudflats with clumps of saltbush including one or several of the following species; <i>Tecticornia</i> spp. (e.g. <i>Tecticornia indica</i> subsp. <i>julacea</i> , <i>Tecticornia indica</i> subsp. <i>leiostachya</i>), <i>Sesuvium portulacastrum</i> , <i>Sarcocornia quinqueflora</i> subsp. <i>quinqueflora</i> , <i>Suaeda australis</i> , <i>S. arbusculoides</i> , <i>Tecticornia australasica</i> , <i>Salsola kali</i> , algal crusts and the grass <i>Sporobolus virginicus</i> . Sedges are also common. Occurs on supratidal flats with deep saline clay soils and formed from Quaternary estuarine sediments. Occurs along the landward edge of the intertidal zone in a hypersaline environment that is only inundated by the highest spring tides. Soils are grey mottled clays with a crusting surface, and are highly saline. (BVG1M: 35b)	Least Concern	No Concern at Present	7.21	3.832
	11.1.1	<i>Sporobolus virginicus</i> grassland on Quaternary estuarine deposits. <i>Sporobolus</i> spp. usually dominates pure stands although a wide range of other species may be present as scattered individuals including <i>Fimbristylis ferruginea</i> , <i>Cyperus victoriensis</i> , <i>C. scariosus</i> , and sometimes <i>Eleocharis spiralis</i> , <i>Mnesithea rottboellioides</i> , <i>Marsilea mutica</i> , <i>Cynanchum carnosum</i> , <i>Ischaemum australe</i> , <i>Cyperus polystachyos</i> , <i>Ceratopteris thalictroides</i> and <i>Leptochloa fusca</i> . Occasional emergent stunted mangroves, usually <i>Avicennia marina</i> or <i>Ceriops tagal</i> , may occur as isolated individuals or along small channels. There may also be a minor presence of salt-tolerant forbs such as <i>Suaeda</i>	Least Concern	No Concern at Present		

Mapped RE	RE	Description	VMA Class	Biodiversity Status	Pre-clear Extent (ha)	2006 Extent (ha)
		<i>australis</i> , <i>S. arbusculoides</i> , <i>Sarcocornia quinqueflora</i> subsp. <i>quinqueflora</i> or <i>Tecticornia australasica</i> . Occurs on supratidal flats which are often only inundated by highest spring tides. Often occurs on the landward side of intertidal flats; seaward margins irregularly inundated with tidal waters and dissected by small tidal channels. Formed from Quaternary estuarine sediments with deep grey or black and grey saline cracking clays with occasional mottling, minor gilgai occasionally present. (BVG1M: 35b)				
11.1.2		Samphire forbland on marine clay plains	Least Concern	No Concern at Present	1068.944	1068.905
11.1.2/11.1.4	11.1.2	Samphire forbland on marine clay plains	Least Concern	No Concern at Present	88.039	88.038
	11.1.4	Mangrove low forest on Quaternary estuarine deposits. Low open-shrubland to closed forest of mangrove species forming a variety of associations, depending on position in relation to salt water inundation. <i>Avicennia marina</i> is the most common dominant but also other trees such as <i>Aegiceras corniculatum</i> , <i>Rhizophora</i> spp. and <i>Ceriops tagal</i> dominate often in pure stands. There is often a shrub layer consisting of juvenile plants of the above species. Other species such as <i>Excoecaria agallocha</i> , <i>Bruguiera</i> spp., <i>Lumnitzera racemosa</i> and <i>Alchornea ilicifolia</i> may also occur. Occurs on intertidal flats which are often dissected by tidal streams. Soils are usually deep saline clays. (BVG1M: 35a)	Least Concern	No Concern at Present		
11.1.3		Sedgeland to grasslands on Quaternary estuarine deposits. Sedgeland dominated by a range of sedges and grasses which include <i>Eleocharis philippinensis</i> , <i>Cyperus alopecuroides</i> ,	Of Concern	Of Concern	19.354	19.317

Mapped RE	RE	Description	VMA Class	Biodiversity Status	Pre-clear Extent (ha)	2006 Extent (ha)
		<i>C. scariosus</i> and <i>C. iria</i> and the grasses <i>Sporobolus virginicus</i> and <i>Paspalum vaginatum</i> . Other typical species in shallower margins include <i>Fimbristylis ferruginea</i> , <i>Phyla nodiflora</i> and <i>Cyperus polystachyos</i> var. <i>polystachyos</i> . Occasional twiners such as <i>Cynanchum carnosum</i> may be present. Occurs in depressions on Quaternary estuarine deposits which are brackish to saline. These are may be seasonally inundated with fresh water, but dry out completely before the next season's rain. (BVG1M: 34c)				
11.3.1		Open-forest dominated by <i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> (particularly in southern parts), with or without scattered emergent <i>Eucalyptus</i> spp. such as <i>E. coolabah</i> , <i>E. largiflorens</i> , <i>E. populnea</i> , <i>E. orgadophila</i> , and <i>E. woollsiana</i> . A low tree layer dominated by <i>Geijera parviflora</i> and <i>Eremophila mitchellii</i> is usually present. The vegetation sometimes occurs as low open-forest or woodland. Tree height generally about 11-15m and the low tree (to tall shrub) understorey layer is between 2 and 8m high (where present). Ground cover is generally sparse. Associated with Cainozoic alluvial plains which may be occasionally flooded. Landforms range from level to very gently sloping plains, alluvial flats, drainage floors, back-swamps and abandoned channels. Associated soils are predominantly deep to very deep cracking clays, sometimes with gilgai or texture contrast soils with sandy surface (particularly where <i>Eucalyptus populnea</i> is present). (BVG1M: 25a)	Endangered	Endangered	405.463	2.688
11.3.4		<i>Eucalyptus tereticornis</i> woodland to open-forest. Other tree species that may be present and locally dominant include <i>E. camaldulensis</i> , <i>Corymbia</i>	Of Concern	Of Concern	1927.78	121.374

Mapped RE	RE	Description	VMA Class	Biodiversity Status	Pre-clear Extent (ha)	2006 Extent (ha)
		<i>tessellaris</i> , <i>E. coolabah</i> , <i>C. clarksoniana</i> , <i>E. populnea</i> or <i>E. brownii</i> , <i>E. melanophloia</i> , <i>E. platyphylla</i> or <i>Angophora floribunda</i> . <i>E. crebra</i> and <i>Lophostemon suaveolens</i> may be locally dominant (subregion 14). A shrub layer is usually absent, and a tall grassy ground layer is often prominent, and may include any of <i>Bothriochloa bladhii</i> subsp. <i>bladhii</i> , <i>Aristida</i> spp., <i>Heteropogon contortus</i> , <i>Dichanthium</i> spp. and <i>Themeda triandra</i> . Heavily grazed areas tend to have shorter or annual grasses such as <i>Dactyloctenium radulans</i> or <i>Bothriochloa</i> spp. Occurs on Cainozoic alluvial plains and terraces. Occurs on variety of soils, including deep cracking clays, medium to fine textured soils, and deep texture-contrast soils. (BVG1M: 16c)				
11.3.11		Semi-evergreen vine thicket or semi-deciduous notophyll rainforest, frequently with emergent <i>Eucalyptus tereticornis</i> or <i>E. raveretiana</i> . Common species include <i>Diospyros humilis</i> , <i>D. geminata</i> , <i>Brachychiton australis</i> , <i>B. rupestris</i> , <i>Geijera salicifolia</i> , <i>Lysiphyllum</i> spp., <i>Mallotus philippensis</i> and <i>Streblus brunonianus</i> . Occasional shrubs such as <i>Carissa ovata</i> may be present. Forbs such as <i>Nyssanthes</i> spp. may also be present. Occurs on Cainozoic alluvial plains. (BVG1M: 7a)	Endangered	Endangered	116.693	0
11.3.25		<i>Eucalyptus camaldulensis</i> or <i>E. tereticornis</i> open-forest to woodland. Other tree species such as <i>Casuarina cunninghamiana</i> , <i>E. coolabah</i> , <i>Melaleuca bracteata</i> , <i>Melaleuca viminalis</i> , <i>Livistona</i> spp. (in north), <i>Melaleuca</i> spp. and <i>Angophora floribunda</i> are commonly present and may be locally dominant. An open to sparse, tall shrub layer is frequently present dominated by	Least Concern	Of Concern	824.074	776.29

Mapped RE	RE	Description	VMA Class	Biodiversity Status	Pre-clear Extent (ha)	2006 Extent (ha)
		species including <i>Acacia salicina</i> , <i>A. stenophylla</i> or <i>Lysiphyllum carronii</i> . Low shrubs are present, but rarely form a conspicuous layer. The ground layer is open to sparse and dominated by perennial grasses, sedges or forbs such as <i>Imperata cylindrica</i> , <i>Bothriochloa bladhii</i> , <i>B. ewartiana</i> , <i>Chrysopogon fallax</i> , <i>Cyperus dactyloides</i> , <i>C. difformis</i> , <i>C. exaltatus</i> , <i>C. gracilis</i> , <i>C. iria</i> , <i>C. rigidellus</i> , <i>C. victoriensis</i> , <i>Dichanthium sericeum</i> , <i>Leptochloa digitata</i> , <i>Lomandra longifolia</i> or <i>Panicum</i> spp. Occurs on fringing levees and banks of major rivers and drainage lines of alluvial plains throughout the region. Soils are very deep, alluvial, grey and brown cracking clays with or without some texture contrast. These are usually moderately deep to deep, soft or firm, acid, neutral or alkaline brown sands, loams or black cracking or non-cracking clays, and may be sodic at depth. (BVG1M: 16a)				
11.3.29		<i>Eucalyptus crebra</i> , <i>E. exserta</i> , <i>Corymbia dallachiana</i> , <i>C. intermedia</i> woodland usually with a low tree understorey of <i>Melaleuca viridiflora</i> and <i>M. nervosa</i> . Occurs on broad plains and fans formed from Quaternary alluvium. Usually associated with bleached sodic duplex soils. (BVG1M: 18b)	Least Concern	No Concern at Present	115.983	33.272
11.4.2		<i>Eucalyptus populnea</i> / <i>E. brownii</i> or <i>E. melanophloia</i> +/- <i>Corymbia dallachiana</i> +/- <i>C. tessellaris</i> +/- <i>E. crebra</i> +/- <i>E. platyphylla</i> woodland. Occurs on Cainozoic clay plains, often on rises or patches of coarser textured material. Cracking clay and texture contrast soils. (BVG1M: 17a)	Of Concern	Of Concern	14576.43	3768.604

Mapped RE	RE	Description	VMA Class	Biodiversity Status	Pre-clear Extent (ha)	2006 Extent (ha)
11.4.9		Open-forest, occasionally woodland, dominated by <i>Acacia harpophylla</i> usually with a low tree mid-storey of <i>Terminalia oblongata</i> and <i>Eremophila mitchellii</i> . <i>Casuarina cristata</i> sometimes replaces <i>Acacia harpophylla</i> in the overstorey and <i>Lysiphyllum cunninghamii</i> sometimes co-dominates. Other low tree or shrub species such as <i>Alectryon diversifolius</i> , <i>Carissa ovata</i> , <i>Pittosporum spinescens</i> , <i>Ehretia membranifolia</i> , <i>Geijera parviflora</i> and <i>Flindersia dissosperma</i> may occur in the mid-storey or low shrub layer. <i>Acacia harpophylla</i> trees have been recorded as 11- 17m high, the mid-storey layer 2- 8m high and the low shrub layer 1-2m high. Occurs on level to gently undulating Cainozoic plains, including weathered basalt. Associated soils are predominantly moderately deep to deep cracking clays that may be brown, red-brown or grey-brown, and with much surface gravel in some areas. (BVG1M: 25a)	Endangered	Endangered	8451.144	160.638
11.4.9/11.3.1	11.4.9	<i>Acacia harpophylla</i> shrubby open-forest to woodland with <i>Terminalia oblongata</i> on Cainozoic clay plains	Endangered	Endangered	179.451	23.989
	11.3.1	<i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open-forest on alluvial plains	Endangered	Endangered		
11.5.8		Mosaic of <i>Melaleuca viridiflora</i> and/or <i>M. nervosa</i> woodland and <i>Eucalyptus crebra</i> , <i>Corymbia intermedia</i> , <i>E. latisinensis</i> and <i>Lophostemon suaveolens</i> woodland. Occurs on gently undulating plains and rises formed from unconsolidated coarse and medium textured Cainozoic sediments. Associated soils are yellow and brown duplex or yellow and red gradational.	Least Concern	No Concern at Present	56.601	56.601

Mapped RE	RE	Description	VMA Class	Biodiversity Status	Pre-clear Extent (ha)	2006 Extent (ha)
		(BVG1M: 21a)				
11.5.8/11.7.2	11.5.8	<i>Melaleuca</i> spp., <i>Eucalyptus crebra</i> , <i>Corymbia intermedia</i> woodland on Cainozoic sandplains/remnant surfaces	Least Concern	No Concern at Present	1639.994	816.148
	11.7.2	Monospecific stands of <i>Acacia</i> spp. forest/woodland on Cainozoic lateritic duricrusts. <i>Acacia shirleyi</i> and or <i>Acacia catenulata</i> usually predominate the woodland to low woodland to low open-forest tree canopy (7-12m high). Other <i>Acacia</i> spp. that commonly occur and occasionally dominate the tree layer include <i>A. rhodoxylon</i> , <i>A. burrowii</i> , <i>A. sparsiflora</i> , <i>A. crassa</i> and <i>A. blakei</i> . Emergent eucalypt species such as <i>Eucalyptus thozetiana</i> , <i>E. crebra</i> , <i>E. decorticans</i> and <i>E. exserta</i> may be present. A low shrub layer is sometimes present and dominated by species such as <i>Acalypha eremorum</i> , <i>Croton phebalioides</i> and <i>Carissa ovata</i> . The ground layer is extremely sparse and dominated by grasses such as <i>Aristida caput-medusae</i> , <i>Paspalidium rarum</i> , and <i>Urochloa foliosa</i> . Forbs are usually rare although <i>Sida filiformis</i> may be conspicuous. Occurs on scarps and adjacent tops and slopes of dissected tablelands, mesas and buttes formed from chemically altered sediments and duricrusts. The soils are shallow to very shallow lithosols with surface stone and boulders. The vegetation is often growing in pockets of shallow lithosol soil between bare rock. (BVG1M: 24a)	Least Concern	No Concern at Present		
11.5.9		<i>Eucalyptus crebra</i> and/or <i>Eucalyptus melanophloia</i> woodland. Other tree species that may be present and locally dominant include <i>Corymbia citriodora</i> or <i>C. clarksoniana</i> sometimes in association with <i>C. intermedia</i> , <i>C. dallachiana</i> ,	Least Concern	No Concern at Present	467.524	296.056

Mapped RE	RE	Description	VMA Class	Biodiversity Status	Pre-clear Extent (ha)	2006 Extent (ha)
		<i>C. lamprophylla</i> , <i>E. tenuipes</i> , <i>E. exserta</i> , <i>E. cloeziana</i> , <i>E. acmenoides</i> . The mid layer ranges from absent to a sparse to dense shrubland typically dominated by <i>Acacia</i> spp. (such as <i>A. excelsa</i> , <i>A. leiocalyx</i>), <i>Petalostigma pubescens</i> , <i>Lysicarpus angustifolius</i> , <i>Alphitonia excelsa</i> and occasionally <i>Melaleuca nervosa</i> (on texture contrast soils). Occurs on plateaus and broad crests of hills and ranges which are formed by Cainozoic sandplains. Soils are generally deep red earths. (BVG1M: 18b)				
11.7.2		<i>Acacia</i> spp. woodland on Cainozoic lateritic duricrust. Scarp retreat zone	Least Concern	No Concern at Present	4.057	4.057
11.7.2/11.5.9	11.7.2	<i>Acacia</i> spp. woodland on Cainozoic lateritic duricrust. Scarp retreat zone	Least Concern	No Concern at Present	175.881	156.023
	11.5.9	<i>Eucalyptus crebra</i> and other <i>Eucalyptus</i> spp. and <i>Corymbia</i> spp. woodland on Cainozoic sandplains/remnant surfaces.	Least Concern	No Concern at Present		
11.10.7		<i>Eucalyptus crebra</i> and/or <i>E. melanophloia</i> +/- <i>E. populnea</i> shrubby woodland. <i>Eucalyptus melanophloia</i> and/or <i>E. crebra</i> predominate and form a distinct but open canopy. <i>E. populnea</i> is commonly present and may be locally dominant particularly on lower slopes. A low tree to tall shrub layer usually dominated by a range of species including <i>Eremophila mitchellii</i> , <i>Acacia decora</i> , <i>A. longispicata</i> spp. <i>longispicata</i> and <i>A. excelsa</i> is present. A low shrub layer with <i>Petalostigma pubescens</i> and other species is formed in places. The ground layer is variable in cover and composition, but composed mainly of grasses. Occurs on the lower slopes of scarp	Least Concern	No Concern at Present	104.023	77.272

Mapped RE	RE	Description	VMA Class	Biodiversity Status	Pre-clear Extent (ha)	2006 Extent (ha)
		retreats, associated with dissected tablelands. Associated soils are generally moderately deep, acidic, sandy, yellow earths and sandy-surfaced texture contrast soils formed from medium to coarse-grained sediments. (BVG1M: 12a)				
11.10.7/11.10.1	11.10.7	<i>Eucalyptus crebra</i> woodland on coarse-grained sedimentary rocks	Least Concern	No Concern at Present	172.012	139.974
	11.10.1	<i>Corymbia citriodora</i> open-forest on coarse-grained sedimentary rocks	Least Concern	No Concern at Present		
11.11.1		<i>Eucalyptus crebra</i> woodland or tall woodland, often with <i>Acacia rhodoxylon</i> . Other species that may be present include <i>Corymbia citriodora</i> , <i>C. leichhardtii</i> , <i>E. melanophloia</i> , <i>C. erythrophloia</i> , <i>C. clarksoniana</i> , <i>E. fibrosa</i> subsp. <i>fibrosa</i> (subregion 18) and <i>E. moluccana</i> on lower slopes (subregions 14, 17, 18). <i>Macrozamia</i> spp. sometimes present in shrub layer. <i>Lophostemon grandiflorus</i> occurs in gullies within this regional ecosystem in the north of the bioregion. Occurs mainly on sub-coastal hills and ranges formed on moderately to strongly deformed and metamorphosed sediments and interbedded volcanics. (BVG1M: 13c)	Least Concern	No Concern at Present	1343.142	881.758
11.11.10/11.11.1	11.11.10	<i>Eucalyptus melanophloia</i> +/- <i>E. crebra</i> +/- <i>Corymbia dallachiana</i> +/- <i>C. erythrophloia</i> grassy or occasionally shrubby woodland or low woodland. Occurs on moderately to strongly deformed and metamorphosed sediments and Permian sediments. (BVG1M: 17b)	Of Concern	Of Concern	2.686	1.841
	11.11.1	<i>Eucalyptus crebra</i> +/- <i>Acacia rhodoxylon</i> woodland on old sedimentary rocks with varying	Least Concern	No Concern at Present		

Mapped RE	RE	Description	VMA Class	Biodiversity Status	Pre-clear Extent (ha)	2006 Extent (ha)
		degrees of metamorphism and folding				
11.11.10/11.11.15	11.11.10	<i>Eucalyptus melanophloia</i> woodland on deformed and metamorphosed sediments and interbedded volcanics	Of Concern	Of Concern	277.068	150.391
	11.11.15	<i>Eucalyptus crebra</i> +/- <i>Corymbia erythrophloia</i> +/- <i>E. populnea</i> +/- <i>E. melanophloia</i> +/- <i>C. tessellaris</i> +/- <i>C. clarksoniana</i> woodland often with a shrubby layer. <i>Eucalyptus exserta</i> and <i>E. platyphylla</i> present in central coastal part of bioregion. Occurs on undulating rises and low hills, often with distinct strike pattern formed on moderately to strongly deformed and metamorphosed sediments and interbedded volcanics and Permian sediments. (BVG1M: 13c)	Least Concern	No Concern at Present		
11.11.15		<i>Eucalyptus crebra</i> woodland on deformed and metamorphosed sediments and interbedded volcanics.	Least Concern	No Concern at Present	2097.895	289.067
11.11.15/11.4.9	11.11.15	<i>Eucalyptus crebra</i> woodland on deformed and metamorphosed sediments and interbedded volcanics.	Least Concern	No Concern at Present	52.776	7.539
	11.4.9	<i>Acacia harpophylla</i> shrubby open-forest to woodland with <i>Terminalia oblongata</i> on Cainozoic clay plains	Endangered	Endangered		
Non-remnant						25230.55
Total						34174.224

3.4.2 Regulated Regrowth Vegetation

In October 2009, the Queensland Government introduced new arrangements applying to the clearing of high-value regrowth on freehold and leasehold lands. These arrangements also apply to regulated regrowth vegetation within 50 m of identified watercourses in priority reef catchments of the Burdekin, Mackay/Whitsundays and Wet Tropics.

Clearing of regrowth mapped as either high-value regrowth or regrowth watercourse vegetation is now regulated by the Regrowth Vegetation Code. Regulated regrowth vegetation is defined under the *Vegetation Management and Other Legislation Amendment Act 2009* as regrowth vegetation:

- a) identified on the regrowth vegetation map as high value regrowth vegetation; or
- b) located within 50 m of a watercourse identified on the regrowth vegetation map as a regrowth watercourse; or
- c) contained in a category C area shown on a PMAV.

'High value regrowth vegetation' is defined as mature regrowth of native vegetation that has not been subsequently cleared since December 31 1989 (DERM, 2009). Regrowth watercourse vegetation is all native woody vegetation that is located within 50 m of identified regrowth watercourses in priority reef catchment areas.

The DERM High Value Regrowth Vegetation mapping (Version 2) was obtained for the study area (Appendix B). Approximately 1385 ha of the study area are mapped as supporting high value regrowth (Figures 2a-c). This includes 383 ha of regrowth containing Endangered RE, 538 ha of regrowth containing Of Concern RE and 464 ha of regrowth containing Least Concern RE. Neither regrowth watercourses nor regrowth essential habitat are mapped as occurring in the study area.

Approximately 32.8 ha of mapped high value regrowth vegetation occur within the proposed extraction areas. This includes 27.78 ha of regrowth containing Endangered RE, 5.04 ha of regrowth containing Of Concern RE and 0.002 ha of regrowth containing Least Concern RE.

High value regrowth vegetation areas have been mapped using analysis of remotely sensed data to determine the proportion of the ground that is covered by foliage (Foliage Projective Cover - FPC). A FPC of at least 11% was used in preparation of the high-value regrowth vegetation maps as this proportion is most likely to equate to similar measures under national standards that define a forest.

The regrowth vegetation map may show some areas where no regrowth occurs or where the vegetation was legitimately cleared since 2007. This is because the remotely sensed data is not able to discriminate between the foliage of native trees and non-native trees, and also because the best available imagery is from 2006–07. DERM acknowledges that this is an inevitable result of the method used to create the map.

In areas where there is no woody vegetation, the Regrowth Vegetation Code does not apply. For example, in areas mapped as high value regrowth but which are dominated by non-native woody species, these can be cleared without having to refer to the code. In most situations, corrections to the regrowth vegetation maps are not required. However, the boundaries of the mapped regrowth vegetation can be modified via the Property Map of Assessable Vegetation (PMAV) process at no cost.

Many exemptions apply to the regrowth regulations, including:

- clearing regrowth vegetation for routine management and essential management e.g. fire management lines, fire breaks and fence;
- establishing necessary built infrastructure in areas less than two hectares;

- clearing areas of regulated regrowth vegetation for extractive industry within a key resource area or for a significant community project; or
- burning vegetation to reduce hazardous fuel loads.

The full list of exemptions is contained in the *Guide to exemptions under the vegetation management framework* (available from the DERM website).

3.4.3 Threatened Ecological Communities

Ecological communities are naturally occurring biological assemblages that occur in a particular type of habitat. Threatened ecological communities (TECs) are ecological communities that have been assessed and assigned to a particular category related to the status of the threat to the community at a national scale, i.e. extinct, critically endangered, endangered, vulnerable and conservation dependant. TECs are protected under the EPBC Act.

Based on the EPBC Protected Matters Search Tool (Appendix C) three endangered TECs are predicted to occur within the study area, these being:

- Brigalow (*Acacia harpophylla* dominant and co-dominant);
- Natural grasslands of the Queensland Central Highlands and the northern Fitzroy; and
- Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions.

In Queensland, TECs are defined by certain REs which are listed in the listing advice of each TEC. Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological communities are mapped within and adjacent the study area as comprising REs 11.3.1 and 11.4.9. The total extent of these communities within the study area (as mapped in v6.0b of the certified RE mapping) is approximately 195 ha. Approximately 11.8 ha of RE 11.4.9 occur within the proposed extraction areas. No natural grasslands or semi-evergreen vine thickets are mapped from the study area.

3.4.4 Essential Habitat

To manage clearing and prevent loss of biodiversity, the DERM has mapped areas designated as essential habitat for species listed as Endangered, Vulnerable, or Near Threatened under the NCA. There is no essential habitat identified as occurring on the study area.

3.4.5 Threatened Species

Threatened flora species are defined as those species listed under the provisions of the EPBC Act (Cwlth) and/or the Queensland Nature Conservation (Wildlife) Regulation 2006, the regulation to the *Nature Conservation Act 1992* (NC Act). Table 5 lists all threatened flora species recorded in the EPBC Protected Matters, the DERM Wildlife Online and the Queensland Herbarium's HERBRECS database searches and their respective conservation status.

EPBC Protected Matters

The EPBC Protected Matters Search Tool identified the general region which includes the study area as having potential habitat for two nationally threatened flora species listed under the EPBC Act (Table 5; Appendix C).

According to the EPBC Protected Matters database, two listed flora species are predicted to occur within the study area (Table 5; Appendix C), these being:

- *Cycas ophiolitica* (Endangered); and
- *Leucopogon cuspidatus* (Vulnerable).

It should be noted that the EPBC online search gives details of species that are predicted to be present with the defined area based on bioclimatic modelling. As such, these species have not

necessarily been observed within the study area. Table 5 lists all protected flora species recorded in the EPBC Protected Matters and the DERM Wildlife Online database searches and their respective threat status.

Wildlife Online

Species listed under Queensland legislation that may be present in vicinity of the study area were obtained from the DERM Wildlife Online database and the Queensland Herbarium's specimen database (HERBRECS).

A query of the DERM Wildlife Online database (Appendix D) returned 199 plant species that have been historically recorded within the study area. These included 167 native species and 32 exotic species. One threatened flora species has been recorded within the search area, this being:

- *Solanum elaeagnifolium* (Endangered).

It should be noted that the Wildlife Online database consists of observations that come from a wide range of public sources. As a consequence there is no control over quality and the veracity of individual records may vary.

HERBRECS Retrieval

The Queensland Herbarium's (DERM) specimen database (HERBRECS) search returned 436 records of 310 species for the general area (a 10 km buffer around the study area). This count is not exclusive, and is based on limited field collections. Of these 310 records 44 species are non-native exotic species and two species are listed as threatened under the NCA:

- *Paspalidium scabrifolium* (Near Threatened); and
- *Hakea trineura* (Vulnerable).

Table 5 Threatened flora previously recorded or predicted to occur within the study area

Taxa	Common Name	Status		Previous recording*	Habitat characteristics	Likelihood of occurrence
		EPBC	NCA			
<i>Hakea trineura</i>	three-veined hakea	V	V	Y	Occurs on serpentinite-derived soil, often with broad-leaved ironbark (<i>Eucalyptus fibrosa</i>) and <i>Corymbia xanthope</i> woodland over hummock grassland on hills.	Unlikely. Serpentinite-derived soils not represented in study area.
<i>Cycas ophiolitica</i>	Marlborough blue	E	E		Occurs from Marlborough in the north, to the Fitzroy River near Rockhampton in the south, in woodland or open woodland dominated by eucalypts, often on serpentinite substrates. Plants occur along hilly outcrops and in lower regions near creek systems.	Unlikely. Habitat for this species not represented in study area.
<i>Leucopogon cuspidatus</i>	northern beard heath	V	LC		Occurs mainly in open forest, woodland and heath on rocky slopes, cliffs and rocky outcrops with granitic or serpentinite substrates.	Unlikely. Habitat for this species not represented in study area.
<i>Paspalidium scabrifolium</i>		NL	N	Y	Occurs in eucalypt woodlands on the lower and mid slopes of hills and ranges on volcanic derived soils. It is known to occur in brigalow areas (Sharp & Simon, 2002).	Unlikely. Habitat for this species not represented in study area.
<i>Solanum elachophyllum</i>		NL	E		Known only from limited collections in the Leichhardt pastoral district, occurring on cracking clay soils associated with brigalow (<i>Acacia harpophylla</i>), belah (<i>Casuarina</i>	Possible. Habitat for this species represented in study area.

cristata), *Macropteranthes* or *Eucalyptus cambageana*.

EPBC –*Environment Protection and Biodiversity Conservation Act 1999* (Cwth); E –Endangered; V – Vulnerable; NL – Not Listed

NCA –*Nature Conservation Act 1992* (QLD), E – Endangered; V – Vulnerable; N – Near Threatened; LC –Least Concern.

* Previously recorded within 10 km of the study area (Wildlife Online and HERBRECS databases).

3.4.6 Marine Plants

Marine plants are protected under the *Fisheries Act 1994*, administered by Queensland Primary Industries and Fisheries (Department of Employment, Economic Development and Innovation). Marine plants grow on or adjacent to tidal lands and include mangroves, seagrass, salt couch, algae, samphire (succulent) vegetation and adjacent plants such as melaleuca (paper barks) and casuarina (coastal she-oaks). Protection is attributed to all parts of marine plants (leaves, roots, branches etc.).

Marine plants occur within the study area in the following mapped REs:

- *Sporobolus virginicus* grassland on marine clay plains (RE 11.1.1);
- samphire forblands on marine clay plains (RE 11.1.2);
- sedgeland on marine clay plains (RE 11.1.3); and
- mangrove forest/woodland on marine clay plains (RE 11.1.4).

3.4.7 Weeds

A weed is defined as any plant that requires some form of action to reduce its harmful effects on the economy, the environment, human health and amenity (Natural Resource Management Ministerial Council, 2006). There are two types of invasion: introduction of exotic plants and movement by native species into new areas well outside their native range. Weeds have an adverse effect on an area's environmental values and ecological functioning for the following reasons:

- Competition with native species;
- Change in the structure of a plant community through addition or removal of strata;
- Repress recruitment of native species;
- Change the natural fire fuel characteristics, which can change the natural fire regime to the detriment of native species, often resulting in the loss of native species;
- Change the food sources and habitat values available to native fauna, reducing some and increasing others;
- May change geomorphological processes such as erosion; and
- May lead to changes in the hydrological cycle.

Weed species considered to be of greatest threat to natural and economic values on a national basis have been ranked as Weeds of National Significance (WONS) (Thorp and Lynch 1999). Weed significance at a national level was assessed using four major criteria:

- Invasiveness;
- Impacts;
- Potential for spread; and
- Socio-economic and environmental impacts.

At a State level, the *Land Protection (Pest and Stock Route Management) Act 2002* (LPA) identifies those weed species that represent a threat to primary industries, natural resources and the environment. Under the LPA, a weed species can be declared as a Class 1, 2 or 3 Pest based on its potential to become a serious pest and the degree of infestation in Queensland (Table 6).

Table 6 Categories of declared plants in Queensland.

Priority Class	Description
Class 1	A Class 1 pest is one that is not commonly present in Queensland, and if introduced would cause an adverse economic, environmental or social impact. Class 1 pests established in Queensland are subject to eradication from the state. Landowners must take reasonable steps to keep land free of Class 1 pests.
Class 2	A Class 2 pest is one that is established in Queensland and has, or could have, a substantial adverse economic, environmental or social impact. The management of these pests requires coordination and they are subject to local government-, community or landowner-led programs. Landowners must take reasonable steps to keep land free of Class 2 pests.
Class 3	A Class 3 pest is one that is established in Queensland and has or could have a substantial adverse economic, environmental or social impact. Its impact or potential impact is however considered to be less significant than that of a Class 2 pest.

The Wildlife Online and HERBRECS database searches indicates that ten declared pest plant species have been previously recorded within the search area, these being:

- *Acacia nilotica* (prickly acacia – Class 2 and WONS);
- *Bryophyllum delagoense* (mother-of-millions - Class 2);
- *Cryptostegia grandiflora* (rubber vine - Class 2 and WONS);
- *Hymenachne amplexicaulis* (hymenachne – Class 2 and WONS);
- *Jatropha gossypifolia* (bellyache bush – Class 2);
- *Lantana camara* (lantana – Class 3 and WONS);
- *Opuntia stricta* (prickly pear - Class 3);
- *Opuntia tomentosa* (velvety tree pear - Class 3);
- *Parthenium hysterophorus* (parthenium weed – Class 2 and WONS); and
- *Sporobolus jacquemontii* (American rat's tail grass – Class 2).

3.5 Field Survey Results

3.5.1 Vegetation Communities

Vegetation communities surveyed within the study area included eucalypt woodland, brigalow woodland, semi-evergreen vine thicket, sedgeland vegetation, patches of regrowth, and cleared sites associated with pastoral land use. Detailed description of the vegetation communities present within the study area are detailed below. The vegetation communities delineated on site are broadly consistent with the mapped REs. Plant taxa observed during the field investigation are listed in Appendix E.

1. Sedgeland on estuarine plains

The sedgeland community was recorded from the northern part of the study area on soils derived from estuarine deposits. The ecologically dominant layer is characterised by various grass, sedge and forb species. Typical species include *Panicum effusum* (hairy panic), *Chloris divaricata* (spreading windmill grass), *Portulaca bicolor* (pigweed), *Fimbristylis ferruginea* (common fingerrush), *Isolepis inundata* (swamp club rush), *Phyla nodiflora* (phyla), *Tetragonia tetragonioides* (New Zealand spinach), *Salsola kali* (soft roly poly), among other taxa and monospecific patches of *Sporobolus*

virginicus (saltwater couch). The species composition, land form and soil type correspond with the description of RE 11.1.3 (VMA Class: Of Concern). Corresponding sites: 18, 27, 28.

2. *Melaleuca leucadendra* and/or *Eucalyptus tereticornis* fringing open forest

This vegetation community occurs along active riparian areas throughout the study area. The canopy tended to be between 15 and 20 m and characterised by *Melaleuca leucadendra* and/or *Eucalyptus tereticornis*. Other taxa that may occur in the canopy include *Corymbia tessellaris* (carbeen) and *Lophostemon grandiflorus* (northern swamp mahogany). An understorey is often present and may be characterised by *Melaleuca viminalis* (weeping bottlebrush), *Casuarina cunninghamiana* (river sheoak), *Alphitonia excelsa* (red ash), *Planchonia careya* (cocky apple), *Melia azedarach* (white cedar) or *Acacia salicina* (sally wattle). A variable shrub layer may be present at some sites and consist of *Carissa ovata* (currant bush), *Breynia oblongifolia* (coffee bush), *Petalostigma pubescens* (quinine berry) or *Indigofera* spp. The exotic species **Lantana camara* (lantana) and **Stylosanthes scabra* (stylo) may invade this community at some sites. The ground layer tends to be open to sparse and consist *Lomandra longifolia* (spiny-head matrush), *Themeda triandra* (kangaroo grass), *Chrysopogon fallax* (golden-beard grass), *Epaltes australis* (spreading nut-heads) or *Dichanthium sericeum* (Queensland bluegrass). The ground layer is prone to invasion by exotic species such as **Megathyrsus maximus* (Guinea grass), **Stachytarpheta jamaicensis* (snake weed), or **Paspalum dilatatum* (paspalum). The species composition, land form and soil type correspond with the description of RE 11.3.25 (VMA Class: Least Concern). Corresponding sites: 6, 11, 16, 22.



Figure 3 Vegetation communities: Sedgeland on estuarine plain (left) and *Melaleuca leucadendra* and/or *Eucalyptus tereticornis* fringing open forest (right)

3. *Eucalyptus tereticornis*/*Corymbia tessellaris* +/- *E. crebra* woodland on alluvial plains

This vegetation community is associated with alluvial plains and is characterised by *Eucalyptus tereticornis* (forest red gum) with *Corymbia tessellaris* (carbeen) to 22 m. *Eucalyptus crebra* (narrow-leaved ironbark) can sometimes be present. An understorey is often present and comprised of *Lophostemon suaveolens* (swamp mahogany), *Lysiphyllum hookeri* (pegunny) and *Alphitonia excelsa* (red ash). *Melaleuca bracteata* (black tea tree), *M. viminalis* (weeping bottlebrush) and/or *M. trichostachya* (tea tree) may be present in associated drainage lines or ponded areas. A sparse shrub layer may be present with taxa such as *Breynia oblongifolia* (coffee bush), *Carissa ovata* (currant bush) or *Alectryon diversifolius* (boonaree). The ground layer tends to be dense and dominated by grasses such as *Bothriochloa* spp., *Themeda triandra* (kangaroo grass) and *Heteropogon contortus* (black spear grass). The species composition, land form and soil type correspond with the description of RE 11.3.4 (VMA Class: Of Concern). Corresponding sites: 13, 23.

4. Semi-evergreen vine thicket on alluvial soils

This vegetation community was recorded from alluvial terraces associated with the Styx River. The canopy tended to be between seven and 10 m tall and comprised of a variety of species including *Gossia bidwillii* (python tree), *Mallotus philippensis* (red kamala), *Strychnos pilosperma* (strychnine bush), *Sterculia quadrifida* (peanut tree), *Aphananthe philippensis* (rough leaved elm), *Melia azedarach* (white cedar), *Cupaniopsis anacardioides* (tuckeroo) among other taxa. Individuals of *Eucalyptus tereticornis* (forest red gum) and *Corymbia tessellaris* (carbeen) are occasionally emergent through the canopy. A shrub layer is present and consists of species including *Alyxia ruscifolia* (chain fruit), *Arytera divaricata* (coogera), *Diospyros geminata* (Queensland ebony), *Ficus opposita* (sandpaper fig), *Exocarpos latifolius* (broadleaved cherry), *Notelaea microcarpa* (velvet mock-orange) and *Carissa ovata* (currant bush). Vines are abundant and include *Jasminum didymum* subsp. *racemosum* (native jasmine), *Trophis scandens* (burny vine), *Clematis glycinoides* (forest clematis), *Pandorea pandorana* (wonga vine), *Legnephora moorei* (round-leaf vine) among other taxa. The species composition, land form and soil type correspond with the description of RE 11.3.11 (VMA Class: Endangered). Corresponding sites: 12, 14.



Figure 4 Vegetation communities: *Eucalyptus tereticornis*/*Corymbia tessellaris* +/- *E. crebra* woodland on alluvial plains (left) and semi-evergreen vine thicket on alluvial soils (right)

5. Brigalow (*Acacia harpophylla*) shrubby woodland

This vegetation community is commonly associated with clay plains and areas of alluvium throughout the study area. The ecologically dominant layer tends to be dominated by *Acacia harpophylla* (brigalow) with *Casuarina cristata* (belah) occasionally present at some sites. Emergent *Eucalyptus moluccana* (gum-topped box) or *E. tereticornis* (forest red gum) may occasionally be present. A low tree or tall shrub layer may be present and characterised by *Alphitonia excelsa* (red ash), *Terminalia oblongata* (yellow-wood), *Maytenus cunninghamii* (yellow-berry bush), *Carissa ovata* (currant bush), *Alectryon diversifolius* (boonaree) and *Geijera parviflora* (wilga). The ground layer tends to be dominated by grasses with exotic grasses becoming more prevalent with increased grazing. Where this community occurs on alluvial soils, it corresponds with the description of RE 11.3.1 (VMA Class: Endangered). Where it occurs on clay plains it corresponds with the description of RE 11.4.9 (VMA Class: Endangered). Corresponding sites: 4, 9, 10, 20, 30. Regrowth sites: 21, 31.



Figure 5 Vegetation community: Brigalow (*Acacia harpophylla*) shrubby woodland remnant (left) and regrowth (right)

6. Mixed eucalypt woodland on clay plains

This dry sclerophyll vegetation community is associated with clay plains in the study area. The canopy is characterised by co-dominance of a range of eucalypt species, including *Eucalyptus crebra* (narrow-leaved ironbark), *E. populnea* (poplar box), *E. moluccana* (gum-topped box), *E. exserta* (Queensland peppermint), *E. platyphylla* (poplar gum), *E. cambageana* (Dawson gum), *Corymbia intermedia* (pink bloodwood) and *C. Tessellaris* (carbeen). The understorey varies from open to sparse and is characterised by *Casuarina cristata* (belah), *Alphitonia excelsa* (red ash), *Petalostigma pubescens* (quinine), *Grevillea striata* (beefwood), *Acacia salicina* (sally wattle), and/or *A. bidwillii* (corkwood wattle). Shrub layer is variable and may include *Eremophila mitchellii* (false sandalwood), *Melaleuca viridiflora* (broad-leaved tea-tree), *Atalaya hemiglauca* (whitewood), and/or *Geijera parviflora* (wilga). Ground layer tends to be dense and characterised by grasses such as *Themeda triandra* (kangaroo grass), *Heteropogon contortus* (black spear grass), *Eragrostis* spp., and *Bothriochloa* spp. The species composition, land form and soil type correspond with the description of RE 11.4.2 (VMA Class: Of Concern). Corresponding sites: 5, 7, 8, 15, 25.

7. *Corymbia intermedia* and/or *Eucalyptus crebra*, +/- *E. platyphylla*, +/- *E. exserta*, +/- *Melaleuca viridiflora* shrubby woodland

This vegetation community is associated with areas mapped as colluvial and residual deposits. The ecologically dominant layer is characterised by *Corymbia intermedia* (pink bloodwood) and/or *Eucalyptus crebra* (narrow-leaved ironbark) to 18 m tall. Other taxa which may be present in the canopy include *Corymbia tessellaris* (carbeen), *Eucalyptus platyphylla* (poplar gum), *Corymbia dallachyana* (Dallachy's gum), *Eucalyptus exserta* (Queensland peppermint) or *Eucalyptus cambageana* (Dawson gum). *Melaleuca viridiflora* (broad-leaved tea tree) may form distinct patches in the understorey in some situations. Other species which may occur in the understorey include *Acacia rhodoxylon* (rosewood), *Alphitonia excelsa* (red ash), *Petalostigma pubescens* (quinine), and *Acacia* spp. A low shrub layer is often present and includes species such as *Notelaea microcarpa*, *Sida hackettiana* or *S. cordifolia*. A grassy ground layer is present and is variable in cover depending on the shrub density. Species common in the ground layer include *Heteropogon contortus* (black speargrass), *Aristida* spp. (wiregrasses), *Bothriochloa* spp. and *Themeda triandra* (kangaroo grass). The species composition, land form and soil type correspond with the description of RE 11.5.8 (VMA Class: Least Concern). Corresponding sites: 1, 2, 17, 19.



Figure 6 Mixed eucalypt woodland on clay plains (left) and *Corymbia intermedia* and/or *Eucalyptus crebra*, +/- *E. platyphylla*, +/- *E. exserta*, +/- *Melaleuca viridiflora* shrubby woodland (right)

8. *Eucalyptus crebra* and/or *Eucalyptus melanophloia* woodland with *Acacia rhodoxylon*

This vegetation community is associated with areas of old sedimentary rock within the study area. The ecologically dominant layer is characterised by *Eucalyptus crebra* (narrow-leaved ironbark) and/or *E. melanophloia* (silver-leaved ironbark) over a well-developed understorey of *Acacia rhodoxylon* (rosewood). A shrub layer is often present and may include *Hibiscus divaricatus*, *Erythroxylon* sp., *Maytenus cunninghamii* (yellow-berry bush), and *Carissa ovata* (currant bush). The ground layer is typically dense and characterised by various grass species. The species composition, land form and soil type correspond with the description of RE 11.11.1 (VMA Class: Least Concern). Corresponding sites: 29, 24 (regrowth).

9. *Eucalyptus crebra*, +/- *E. platyphylla*, +/- *E. populnea* grassy woodland

The canopy of this vegetation community is characterised by *Eucalyptus crebra* (narrow-leaved ironbark). Other species which also occur in the canopy include *Eucalyptus populnea* (poplar box), *Eucalyptus platyphylla* (poplar gum) and *Corymbia dallachiana* (Dallachy's gum). An open to spare understorey may be present and may include *Alphitonia excelsa* (red ash) and *Grevillea striata* (beefwood) among other species. A shrub layer is often present and includes *Maytenus cunninghamii* (yellow-berry bush), *Petalostigma pubescens* (quinine), *Breynia oblongifolia* (coffee bush), *Alectryon diversifolius* (boonaree) and *Hibiscus divaricatus*. Ground layer tends to be dense and characterised by various grass species including *Heteropogon contortus* (black speargrass), *Bothriochloa* spp., *Themeda triandra* (kangaroo grass) and *Panicum* spp. The species composition, land form and soil type correspond with the description of RE 11.11.15 (VMA Class: Least Concern). Corresponding sites: 3, 26.



Figure 7 *Eucalyptus crebra* and/or *Eucalyptus melanophloia* woodland with *Acacia rhodoxylon* (left) and *Eucalyptus crebra*, +/- *E. platyphylla*, +/- *E. populnea* grassy woodland (right)

10. Cleared areas

A large proportion (approximately 74%) of the study area landscape has been heavily altered by grazing activities. Alteration has occurred through direct historical clearing associated with the pastoral industry. These areas typically support a mix of exotic and native perennial grass species and may have patches of regrowth.

3.5.2 Inaccuracies in Certified RE Mapping

Some inconsistencies exist between the certified RE mapping covering the study area and results of the field surveys. Inaccuracies in the mapping are related to either the minimum scale at which the mapping is undertaken (1:100,000) or errors in the attribution of mapped polygons (i.e. misinterpretation of remotely sensed landform or vegetation patterns). Additionally, v6.0b of the RE mapping is based on the vegetation extent in 2006. Some areas of mapped RE may have been altered since that time. Results of the site surveys that are not consistent with the certified RE mapping are summarised in Table 7. Errors in the certified RE mapping can be corrected through preparation of a PMAV over the lots in question. Approximately 227 km² of the study area are already covered with existing PMAVs.

3.5.3 Flora

A total of 215 plant species (Appendix E) were recorded from all sites surveyed across the study area. These include 171 native and 44 exotic or weed species. No EPBC or NCA listed threatened species were recorded from any of the sites surveyed. The black orchid (*Cymbidium canaliculatum*) was identified as an epiphyte on older trees within the study area. This species is offered protection under the NCA due to its commercial value.

3.5.4 Weeds

Of the 212 plant species recorded from all sites surveys during the field inspections (Appendix E), 44 (20%) are exotic or weed species. Nine LPA declared plant species were recorded during the site visit, four of which are listed as Weeds of National Significance (WONS), these being:

- *Aristolochia elegans* (Dutchman's pipe - Class 3);
- *Bryophyllum delagoense* (mother-of-millions - Class 2);
- *Cryptostegia grandiflora* (rubbervine - Class 2 and WONS);
- *Harrisia martini* (harrisia cactus - Class 2);
- *Hymenachne amplexicaulis* (hymenachne - Class 2 and WONS);
- *Lantana camara* (lantana - Class 3 and WONS);
- *Opuntia stricta* (prickly pear - Class 2);
- *Parthenium hysterophorus* (parthenium - Class 2 and WONS); and
- *Sporobolus fertilis* (giant Parramatta grass - Class 2).

Table 7 Summary of inconsistencies between site survey results and certified RE mapping

Site	Easting	Northing	V6.0b RE mapping	Geology mapping	Land Zone	Vegetation Community	Suggested RE	Comments
1	770671	7486049	11.5.8a/11.7.2	Qr,Qf>Kx	5	<i>Corymbia intermedia</i> and/or <i>Eucalyptus crebra</i> , +/- <i>E. platyphylla</i> , +/- <i>E. exserta</i> , +/- <i>Melaleuca viridiflora</i> shrubby woodland	11.5.8	This site occurs in a mapped heterogeneous polygon. Site survey results match the description of 11.5.8.
2	770977	7486025	11.4.2	Qr,Qf>Kx	5	<i>Corymbia intermedia</i> and/or <i>Eucalyptus crebra</i> , +/- <i>E. platyphylla</i> , +/- <i>E. exserta</i> , +/- <i>Melaleuca viridiflora</i> shrubby woodland	11.5.8	Most likely an error related to scale. Site 2 occurs in an area mapped as 11.4.2 which is close to a polygon mapped as 11.5.8a/11.7.2. The geology mapping, soils and species composition match RE 11.5.8 better.
4	773421	7496236	11.4.9/11.3.1	Qpa	4	Brigalow (<i>Acacia harpophylla</i>) shrubby woodland	11.4.9	This site occurs upslope of a drainage line. RE 11.3.1 is associated with alluvium soils with this drainage line. RE 11.4.9 occurs on the clay plains away from alluvial areas.
5	775006	7497589	11.4.9	Qpa	4	Mixed eucalypt woodland on clay plains	11.4.2	Most likely an error related to the scale of the RE mapping. This site occurs close to the boundary of a polygon of 11.4.2. Lines represented on the certified RE maps are ± 100 m of their true position and as such this site could fall in the true extent of RE 11.4.2.
9	774807	7497424	11.4.9/11.3.1	Qpa	4	Brigalow (<i>Acacia harpophylla</i>) shrubby woodland	11.4.9	This site occurs in a mapped heterogeneous polygon. Site survey results match the description of 11.4.9.

Site	Easting	Northing	V6.0b RE mapping	Geology mapping	Land Zone	Vegetation Community	Suggested RE	Comments
10	776532	7491161	11.11.1	Qpa	4	Brigalow (<i>Acacia harpophylla</i>) shrubby woodland	11.4.9	Most likely an error related to scale. This site occurs in a polygon mapped as land zone 11. The underlying geology for this site is Qpa which equates to land zone 4. Site also supports brigalow shrubby woodland and fits with the description of 11.4.9.
12	772278	7495892	non-remnant	Qa	3	Semi-evergreen vine thicket on alluvial soils	11.3.11	This site occurs in a remnant patch of semi-evergreen vine thicket occurring on alluvial soil. The patch would be too small to be mapped on the RE map. The pre-clearing RE for this site is 11.3.1. However, the vegetation community structure and species composition matches the description of 11.3.11.
13	772080	7495753	non-remnant	Qa	3	<i>Eucalyptus tereticornis</i> / <i>Corymbia tessellaris</i> +/- <i>E. crebra</i> woodland on alluvial plains	11.3.4	This remnant patch would be too small to be mapped on the certified RE map. The pre-clearing RE for this site is 11.3.1. However, the vegetation community structure and species composition matches the description of 11.3.4.
14	771548	7495970	11.4.9	Qa	3	Semi-evergreen vine thicket on alluvial soils	11.3.11	This site occurs on an area of mapped alluvial soil (land zone 3). The vegetation community structure and species composition matches the description of 11.3.11.
17	769323	7485894	11.5.8a/11.7.2	Qr,Qf>Kx	5	<i>Corymbia intermedia</i> and/or <i>Eucalyptus crebra</i> , +/- <i>E. platyphylla</i> , +/- <i>E. exserta</i> , +/-	11.5.8	This site occurs in a mapped heterogeneous polygon. Site survey results match the

Site	Easting	Northing	V6.0b RE mapping	Geology mapping	Land Zone	Vegetation Community	Suggested RE	Comments
						<i>Melaleuca viridiflora</i> shrubby woodland		description of 11.5.8.
18	768563	7516369	11.1.2a/11.1.2b	Qhe/m	1	Sedgeland on estuarine plains	11.1.3	Most likely an attribution error. The species composition, including the predominance of sedges and grasses, at this site matches better with the description of RE 11.1.3.
20	770048	7496715	11.4.9	Qpa	3	Brigalow (<i>Acacia harpophylla</i>) shrubby woodland	11.3.1	Most likely an error related to scale of geology mapping. This site occurs along an active drainage line incised into the surrounding clay plain. Soils would be alluvium associated with the drainage channel and as such would meet the definition of RE 11.3.1.
22	776836	7479706	11.4.9	Qa	3	<i>Melaleuca leucadendra</i> and/or <i>Eucalyptus tereticornis</i> fringing open forest	11.3.25	This site is associated with an active drainage line. The underlying geology mapping has the site mapped as Qa (alluvium). Landform, geology, vegetation community structure and species composition fit with the definition of RE 11.3.25.
23	776659	7479977	11.4.2	Qa	3	<i>Eucalyptus tereticornis</i> / <i>Corymbia tessellaris</i> +/- <i>E. crebra</i> woodland on alluvial plains	11.3.4	This site occurs on an alluvial plain associated with an active drainage line. The underlying geology is mapped as Qa (alluvium). Landform, geology, vegetation community structure and species composition fit best with the definition of RE 11.3.4.

Site	Easting	Northing	V6.0b RE mapping	Geology mapping	Land Zone	Vegetation Community	Suggested RE	Comments
27	767165	7514301	11.1.2a/11.1.2b	TQr>Kx	1	Sedgeland on estuarine plains	11.1.3	Most likely an attribution error. The species composition, including the predominance of sedges and grasses, at this site matches better with the description of RE 11.1.3.
28	767518	7514924	11.1.2a/11.1.2b	TQr>Kx	1	Sedgeland on estuarine plains	11.1.3	Most likely an attribution error. The species composition, including the predominance of sedges and grasses, at this site matches better with the description of RE 11.1.3.
29	776504	7494295	11.4.9	Pb	11	<i>Eucalyptus crebra</i> and/or <i>Eucalyptus melanophloia</i> woodland with <i>Acacia rhodoxylon</i>	11.11.1	Most likely an error related to scale. This site occurs in an area which corresponds to land zone 11. The landform, geology, vegetation community structure and species composition fits best with the definition of 11.11.1.
30	776466	7494218	11.4.9	Pb	11	Brigalow (<i>Acacia harpophylla</i>) shrubby woodland	11.4.9	Most likely an error related to scale. This site occurs in close proximity to an area mapped as Qpa and due to scale, it is quite possible that this site is Qpa rather than Pb. The landform, soil, vegetation community structure and species composition fits best with the definition of
31	771423	7496043	11.4.9	Qpa	4	Brigalow (<i>Acacia harpophylla</i>) shrubby woodland	non-remnant (regrowth)	This site occurs in a polygon mapped as remnant 11.4.9. The site survey indicates that the vegetation on site does not fulfil the definition of remnant vegetation under the VMA.

4 Environmentally Significant Areas

4.1 Ecological processes

Ecological processes are those intrinsic landscape scale processes that contribute to the maintenance of biodiversity values in the region. These include the relationships of vegetation to water quality and soil stability, maintenance of biological assemblages and specific ecological communities of local, regional, national and international importance and ecological values including foraging and roosting habitats, food chains and wildlife corridors.

In consideration of the above, the landscape of the study area must be considered within the context of its current status. Of the 342 km² covered by the study area, remnant vegetation only covers some 89.4 km² or approximately a quarter of the land area. A large proportion of the landscape has historically been cleared for conversion to pasture particularly those areas defined by clay plains. Large patches of remnant native vegetation are largely confined to hill slopes or saline flats away from the clay plains. These remnant patches represent significant habitat areas within a largely cleared matrix.

4.2 Significant vegetation

Significant areas of vegetation within the study area include brigalow vegetation both remnant and advanced regrowth. This vegetation type was closely associated with the extensive clay plains of the region and as such has been subjected to intensive clearing. For example, only 2% of the pre-clearing extent of RE 11.4.9 (brigalow open forest on clay plains) remains in the study area. This RE type is offered protection at both the State (under the VMA) and National (under the EPBC Act) level. Significant areas of advanced regrowth of this RE are mapped as high value regrowth containing an endangered RE.

Very little remnant vegetation remains in an undisturbed state with grazing affecting a large proportion of the study area. Connectivity between remnant patches has been greatly reduced by the past extensive clearing activities and conversion to pastures. Remnant riparian vegetation along the major watercourses of the study area provides the most significant connectivity across the study area landscape. These remnant riparian areas remain as important habitat refuges within the generally cleared matrix.

5 References

- Bostock, P.D. and Holland, A.E. (eds) (2010). *Census of the Queensland Flora 2010*. Queensland Herbarium, Department of Environment and Resource Management, Toowong, Queensland.
- Cropper, S.C. (1993). *Management of Endangered Plants*. CSIRO, Canberra.
- Natural Resource Management Ministerial Council (2006). *Australian Weed Strategy – A National Strategy for Weed Management in Australia*. Australian Government Department of the Environment and Water Resources, Canberra ACT.
- Neldner, V.J., Wilson, B. A., Thompson, E.J. and Dillewaard, H.A. (2005). *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland*. Version 3.1. Updated September 2005. Queensland Herbarium, Environmental Protection Agency, Brisbane.
- Queensland Herbarium (2011). Regional Ecosystem Description Database (REDD). Version 6.0b Updated January 2011, (January 2011) Department of Environment and Resource Management, Brisbane.
- Sharp, D. & Simon, B.K. (2002). *AusGrass: Grasses of Australia*. CD-ROM, Version 1.0, Australian Biological Resources Study, Canberra, and Environmental Protection Agency, Queensland.
- Thorp, J.R. and Lynch, R. (2000). The determination of weeds of national significance. National Weeds Strategy Executive Committee.
- Walker, J. and Hopkins, M.S. (1990). Vegetation. In R.C. McDonald, R.F. Isbell, J.G. Speight, J. Walker and M.S. Hopkins (eds), *Australian Soil and Land Survey Field Handbook*, 2nd edition, pp. 58–86. Inkata Press, Melbourne.
- Young, P.A.R., Wilson, B.A., McCosker, J.C., Fensham, R.J., Morgan, G. and Taylor, P.M. (1999). Brigalow Belt. In P.S. Sattler and R.D. Williams (eds) *The Conservation Status of Queensland's Bioregional Ecosystems*. Environmental Protection Agency, Brisbane.

Appendix A

Extract of Certified Regional Ecosystem Mapping

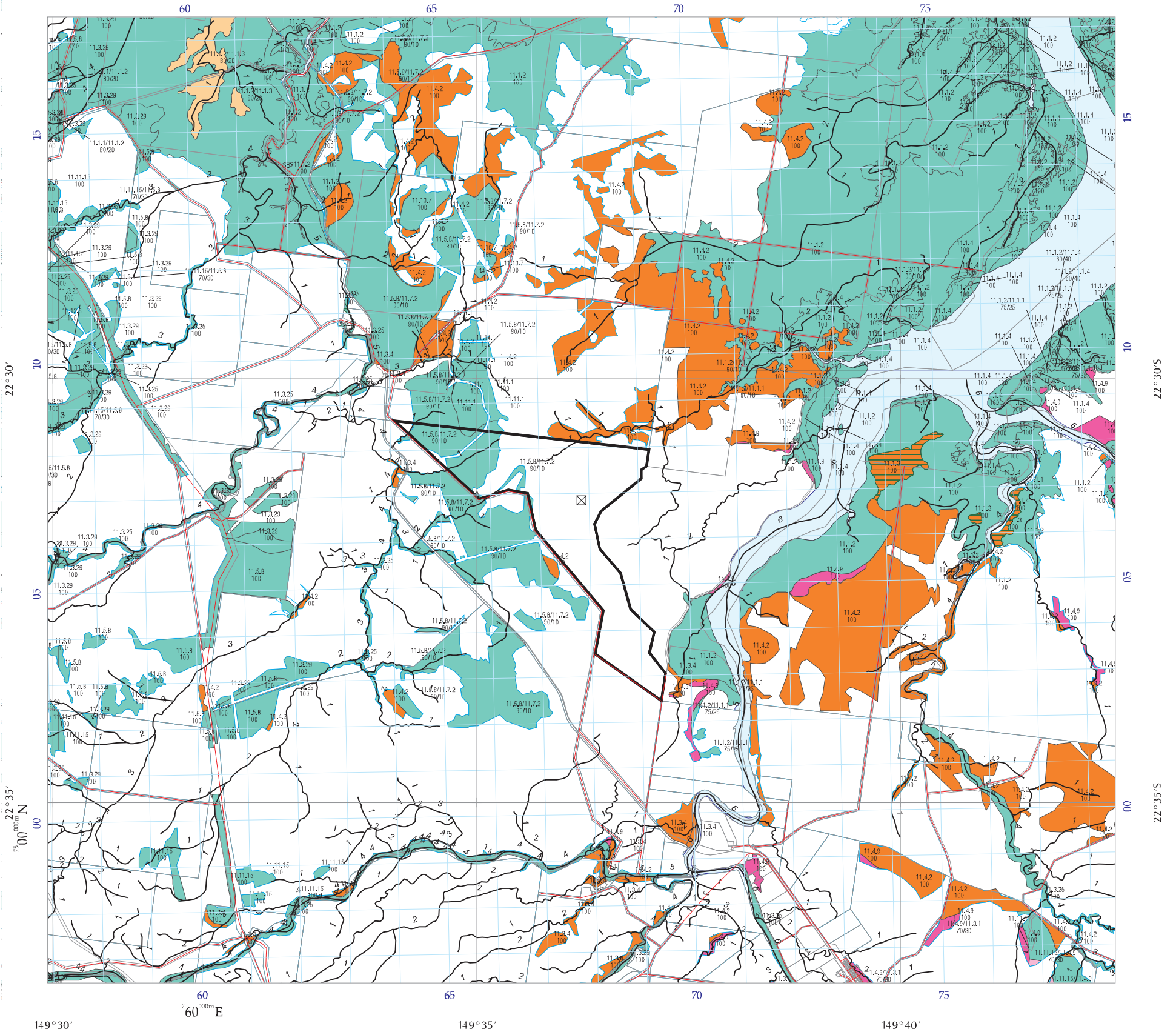
Version 6.0b

(Source: DERM, 2011)

149°30'E

149°35'E

149°40'E



Vegetation Management Act Regional Ecosystem and Remnant Map-Version 6

Remnant vegetation containing endangered regional ecosystems

Based on 2006 Landsat TM imagery

A remnant map covers areas not covered by a regional ecosystem map.

- Dominant
- Sub-dominant

Requested By: ANDREW@OBERONIA.COM.AU
Date: 14 Apr 11 Time: 22.12.50

Defined map areas are labelled with the regional ecosystem (RE) code along with the percentage breakdown if more than one RE occurs within the area. Detailed definitions of regional ecosystems are available from www.derm.qld.gov.au/REDD. Defined map areas smaller than 5ha may not be labelled.

Remnant vegetation containing of concern regional ecosystems

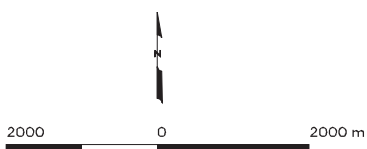
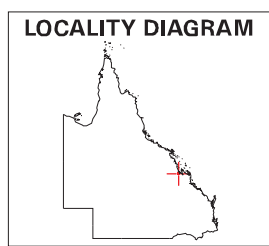
Centered on point position:

Latitude: -22.5238 Longitude: 149.6039 (decimal degrees)
Bioregion: Brigalow Belt

Regional ecosystem linework has been compiled at a scale of 1:100 000, except in designated areas where a compilation scale of 1:50 000 is available. Linework should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100 000 is +/-100 metres. The extent of remnant regional ecosystems as of 2006, depicted on this map is based on rectified 2006 Landsat TM imagery (supplied by the Statewide Landcover and Trees Study (SLATS), Department of Environment and Resource Management (DERM)).

- Dominant
- Sub-dominant
- Remnant vegetation that is a least concern regional ecosystem
- Remnant vegetation under Section 20AH of the VMA
- Non-remnant
- Plantation Forest
- Dam or Reservoir
- Remnant Vegetation
- PMAV Category X area
- Great Barrier Reef Wetlands

- Vegetation Management Act Essential Habitat
For further information on VMA Essential Habitat, please see the attached VMA Essential Habitat map.
- Subject Lot
- Watercourse (Stream order shown as black number against stream where available)
- Bioregion boundary
- Roads © MapInfo Australia Pty Ltd 2009
- National Park, Conservation Area State Forest and other reserves
- Cadastral line
Property boundaries shown are provided as a locational aid only.
- Towns
- Coordinate entered



Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94)

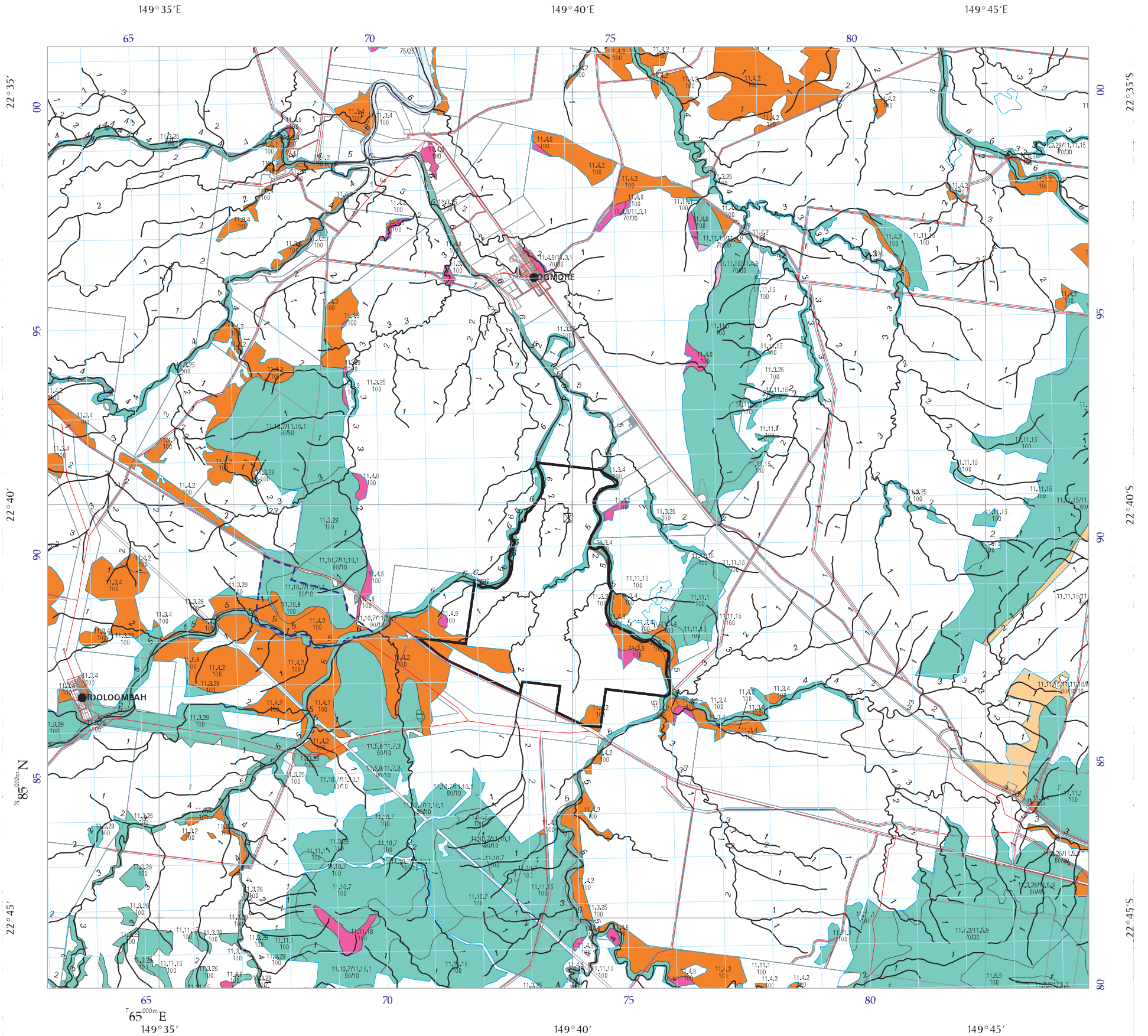
Some watercourse lines are derived from GeoScience Australia 1:250 000 mapping.

Disclaimer:
While every care is taken to ensure the accuracy of this product, the Department of Environment and Resource Management and MapInfo Australia Pty Ltd, makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the product being inaccurate or incomplete in any way and for any reason.

All datasets are updated as they become available to provide the most current information as of the date shown on this map.

Additional information is required for the purposes of land clearing or assessment of a regional ecosystem map or PMAV applications. For further information go to the web site: www.derm.qld.gov.au/vegetation or contact the Department of Environment and Resource Management.

Digital regional ecosystem data is available in shapefile format, for Lot on Plans from www.derm.qld.gov.au/REDATA or from DERM for larger areas.



Vegetation Management Act Regional Ecosystem and Remnant Map-Version 6

- Remnant vegetation containing endangered regional ecosystems
- Dominant
- Sub-dominant
- Remnant vegetation containing of concern regional ecosystems
- Dominant
- Sub-dominant
- Remnant vegetation that is a least concern regional ecosystem
- Remnant vegetation under Section 20AH of the VMA
- Non-remnant
- Plantation Forest
- Dam or Reservoir
- Remnant Vegetation
- PMAV Category X area
- Great Barrier Reef Wetlands
- Vegetation Management Act Essential Habitat
For further information on VMA Essential Habitat, please see the attached VMA Essential Habitat map.
- Subject Lot
- Watercourse (Stream order shown as black number against stream where available)
- Bioregion boundary
- Roads © MapInfo Australia Pty Ltd 2009
- National Park, Conservation Area State Forest and other reserves
- Cadastral line
Property boundaries shown as provided as a locational aid only.
- Towns
- Coordinate entered

Based on 2006 Landsat TM imagery
 Requested By: ANDREW@OBERONIA.COM.AU
 Date: 14 Apr 11 Time: 22.12.40
 Centered on point position:
 Latitude: -22.6692 Longitude: 149.6658 (decimal degrees)
 Bioregion: Brigalow Belt

A remnant map covers areas not covered by a regional ecosystem map.

Defined map areas are labelled with the regional ecosystem (RE) code along with the percentage breakdown if more than one RE occurs within the area. Detailed definitions of regional ecosystems are available from www.derm.qld.gov.au/REDD. Defined map areas smaller than 5ha may not be labelled.

Regional ecosystem linework has been compiled at a scale of 1:100 000, except in designated areas where a compilation scale of 1:50 000 is available. Linework should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100 000 is +/-100 metres. The extent of remnant regional ecosystems as of 2006, depicted on this map is based on rectified 2006 Landsat TM imagery (supplied by the Statewide Landcover and Trees Study (SLATS), Department of Environment and Resource Management (DERM)).

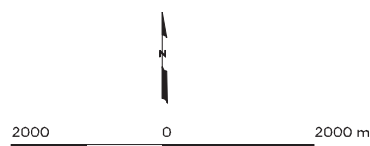
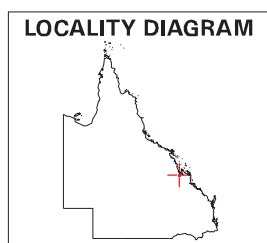
Some watercourse lines are derived from GeoScience Australia 1:250 000 mapping.

Disclaimer:
 While every care is taken to ensure the accuracy of this product, the Department of Environment and Resource Management and MapInfo Australia Pty Ltd, makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the product being inaccurate or incomplete in any way and for any reason.

All datasets are updated as they become available to provide the most current information as of the date shown on this map.

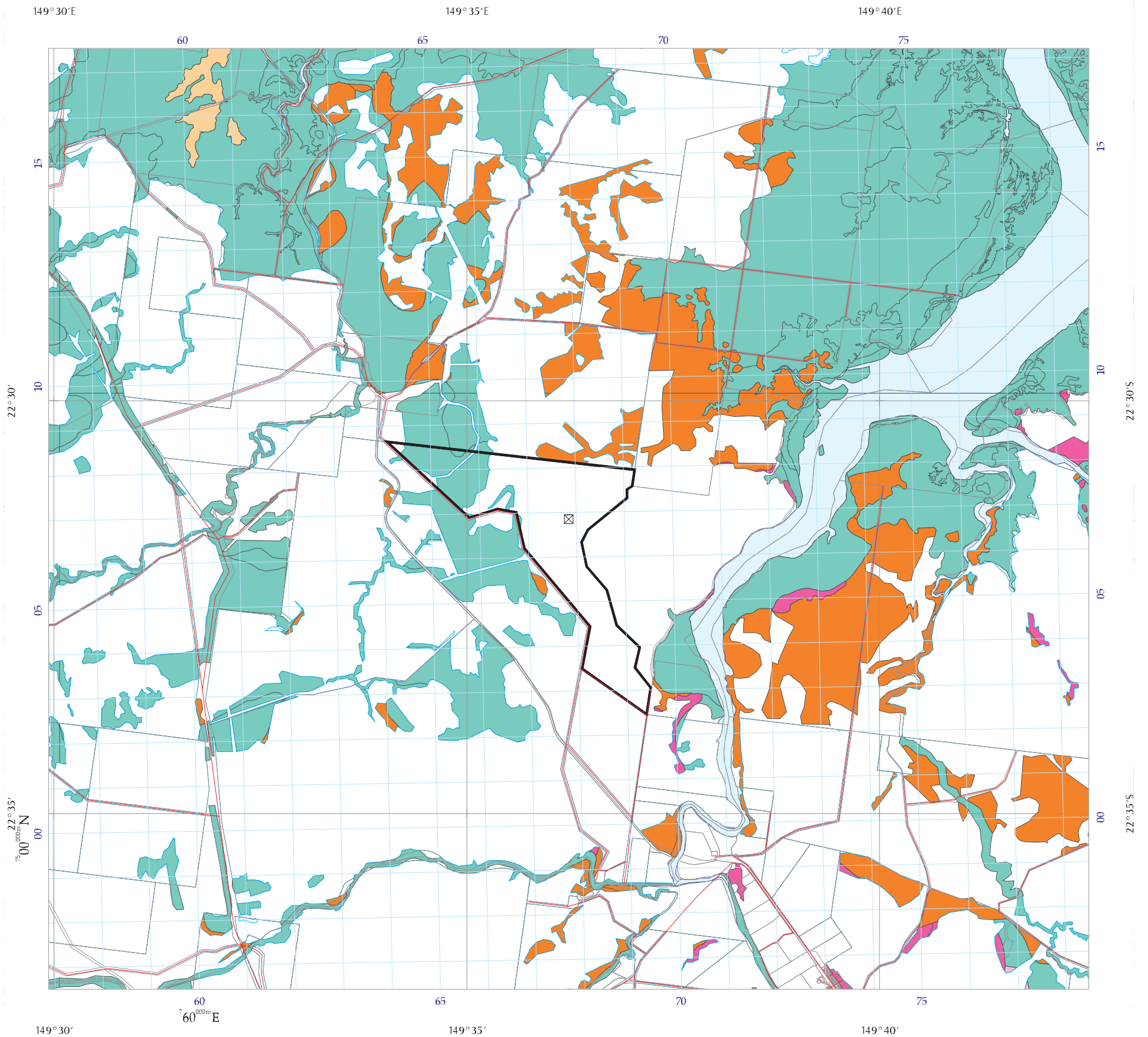
Additional information is required for the purposes of land clearing or assessment of a regional ecosystem map or PMAV applications. For further information go to the web site: www.derm.qld.gov.au/vegetation or contact the Department of Environment and Resource Management.

Digital regional ecosystem data is available in shapefile format, for Lot on Plans from www.derm.qld.gov.au/REDATA or from DERM for larger areas.



Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94)

© The State of Queensland, 2011

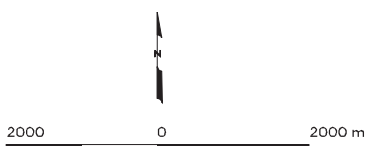
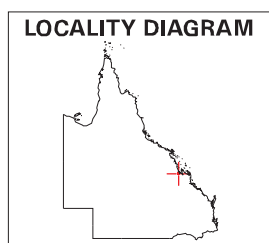


Vegetation Management Act Essential Habitat Map Version 3.0

- Remnant vegetation containing endangered regional ecosystems
- Dominant
- Sub-dominant
- Remnant vegetation containing of concern regional ecosystems
- Dominant
- Sub-dominant
- Remnant vegetation that is a least concern regional ecosystem
- Remnant vegetation under Section 20AH of the VMA
- Non-remnant
- Plantation Forest
- Dam or Reservoir
- Remnant Vegetation
- PMAV Category X area
- Vegetation Management Act Essential Habitat
- Vegetation Management Act Essential Habitat Species Records
- Subject Lot
- Roads © MapInfo Australia Pty Ltd 2009
- National Park, Conservation Area State Forest and other reserves
- Cadastral line
- Property boundaries shown are provided as a locational aid only.
- Towns
- Coordinate entered

Requested By: ANDREW@OBERONIA.COM.AU
Date: 14 Apr 11 Time: 22.12.54

Centered on point position:
Latitude: -22.5238 Longitude: 149.6039 (decimal degrees)



Labels for the Vegetation Management Act Essential Habitat are centred on the subject lot (1.1km surrounding and including a Lot on Plan). Labels correlate to the label field in the attached essential habitat database.

Regional ecosystem linework has been compiled at a scale of 1:100 000, except in designated areas where a compilation scale of 1:50 000 is available. Linework should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100 000 is +/-100 metres. The extent of remnant regional ecosystems as of 2006, depicted on this map is based on rectified 2006 Landsat TM imagery (supplied by SLATS, Department of Environment and Resource Management).

Disclaimer:
While every care is taken to ensure the accuracy of this product, the Department of Environment and Resource Management and MapInfo Australia Pty Ltd, makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the product being inaccurate or incomplete in any way and for any reason.

All datasets are updated as they become available to provide the most current information as of the date shown on this map.

Additional information is required for the purposes of land clearing or assessment of a regional ecosystem map or PMAV applications. For further information go to the web site: www.derm.qld.gov.au/vegetation or contact the Department of Environment and Resource Management.

Digital regional ecosystem data is available in shapefile format, for Lot on Plans from www.derm.qld.gov.au/REDATA or from DERM for larger areas.

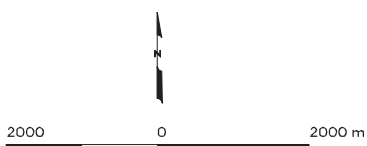
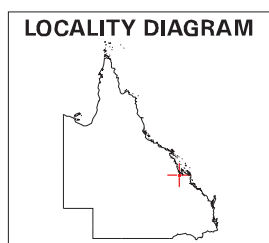


Vegetation Management Act Essential Habitat Map Version 3.0

- Remnant vegetation containing endangered regional ecosystems
- Dominant
- Sub-dominant
- Remnant vegetation containing of concern regional ecosystems
- Dominant
- Sub-dominant
- Remnant vegetation that is a least concern regional ecosystem
- Remnant vegetation under Section 20AH of the VMA
- Non-remnant
- Plantation Forest
- Dam or Reservoir
- Remnant Vegetation
- PMAV Category X area
- Vegetation Management Act Essential Habitat
- Vegetation Management Act Essential Habitat Species Records
- Subject Lot
- Roads © MapInfo Australia Pty Ltd 2009
- National Park, Conservation Area State Forest and other reserves
- Cadastral line
- Property boundaries shown are provided as a locational aid only.
- Towns
- Coordinate entered

Requested By: ANDREW@OBERONIA.COM.AU
Date: 14 Apr 11 Time: 22.12.44

Centered on point position:
Latitude: -22.6692 Longitude: 149.6658 (decimal degrees)



Labels for the Vegetation Management Act Essential Habitat are centred on the subject lot (1.1km surrounding and including a Lot on Plan). Labels correlate to the label field in the attached essential habitat database.

Regional ecosystem linework has been compiled at a scale of 1:100 000, except in designated areas where a compilation scale of 1:50 000 is available. Linework should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100 000 is +/-100 metres. The extent of remnant regional ecosystems as of 2006, depicted on this map is based on rectified 2006 Landsat TM imagery (supplied by SLATS, Department of Environment and Resource Management).

Disclaimer:
While every care is taken to ensure the accuracy of this product, the Department of Environment and Resource Management and MapInfo Australia Pty Ltd, makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the product being inaccurate or incomplete in any way and for any reason.

All datasets are updated as they become available to provide the most current information as of the date shown on this map.

Additional information is required for the purposes of land clearing or assessment of a regional ecosystem map or PMAV applications. For further information go to the web site: www.derm.qld.gov.au/vegetation or contact the Department of Environment and Resource Management.

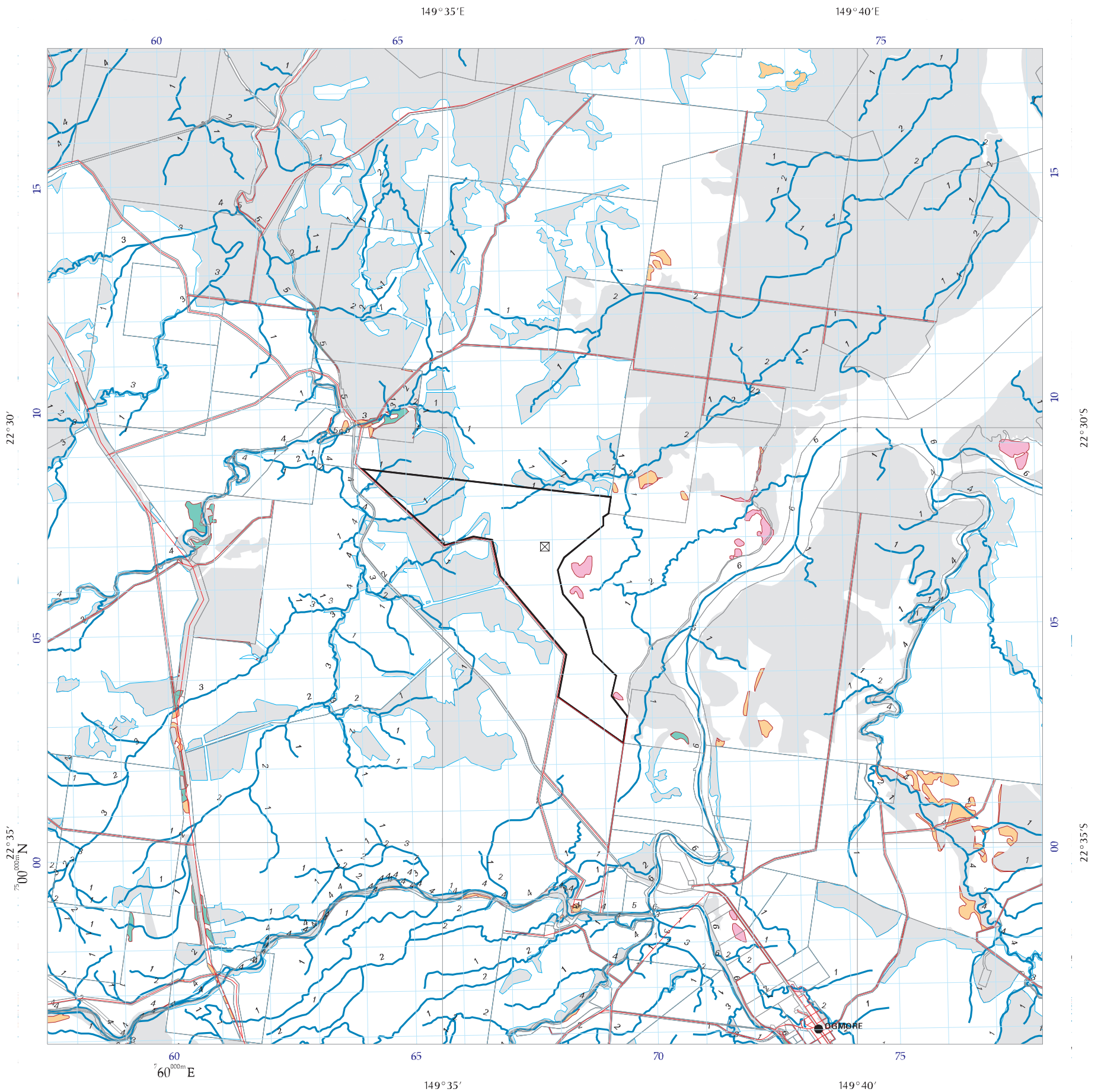
Digital regional ecosystem data is available in shapefile format, for Lot on Plans from www.derm.qld.gov.au/REDATA or from DERM for larger areas.

Appendix B










High Value Regrowth Vegetation Mapping

Version 2.0

(Source: DERM, 2011)



REGROWTH VEGETATION MAP - Version 2.0

-  Vegetation Management Act Essential Regrowth Habitat with example label number
-  Great Barrier Reef Wetland Protection Area
-  High value regrowth vegetation containing Endangered regional ecosystems
-  High value regrowth vegetation containing Of Concern regional ecosystems
-  High value regrowth vegetation that is a Least Concern regional ecosystem
-  Remnant Vegetation
(Refer to the Vegetation Management Act Regional Ecosystem and Remnant Map also available from the Department of Environment and Resource Management website for further information on these areas)
-  Non-remnant
-  PMAV Category X area
-  Regrowth watercourse (Stream order shown as black number against stream)
-  Other watercourse (Stream order shown as black number against stream where available)
-  Subject Lot
-  Roads
-  Cadastral line
Property boundaries shown are provided as a locational aid only.
-  Towns
-  Coordinate entered

Requested By: ANDREW@OBERONIA.COM.AU
Date: 14 Mar 11 Time: 09.30.38

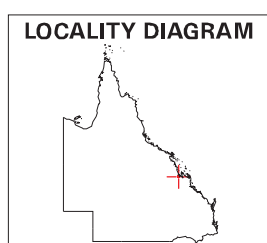
Centered on point position:
Latitude: -22.5238 Longitude: 149.6039 (decimal degrees)

Labels for Vegetation Management Act Essential Regrowth Habitat are centred on the subject lot.
Labels correlate to the label field in the attached essential regrowth habitat database.

The high value regrowth, regrowth watercourse, other watercourse, Great Barrier Reef wetland protection area and essential regrowth habitat data shown on this map are representations of the preliminary data.

Some watercourse lines are derived from GeoScience Australia 1:250 000 mapping.

For further information go to the website:
<http://www.derm.qld.gov.au> or contact Vegetation Management, Department of Environment and Resource Management.

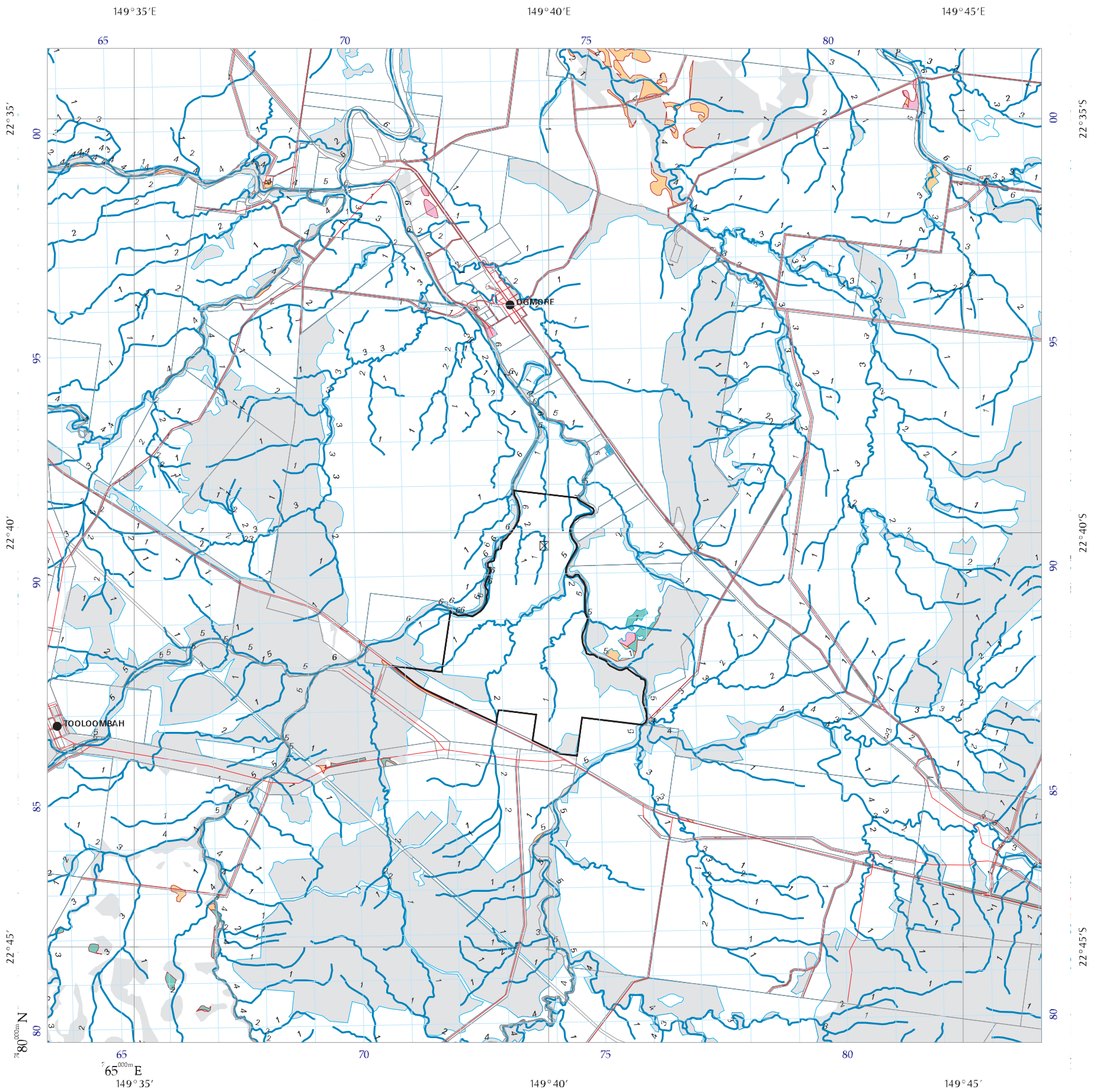


2000 0 2000 m















Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94)

© The State of Queensland, 2011

Areas covered by a Property Map of Assessable Vegetation (PMAV) are represented on the map attached as Page 2 to this Regrowth Vegetation Map and provided with it.



REGROWTH VEGETATION MAP - Version 2.0

-  Vegetation Management Act Essential Regrowth Habitat with example label number
-  Great Barrier Reef Wetland Protection Area
-  High value regrowth vegetation containing Endangered regional ecosystems
-  High value regrowth vegetation containing Of Concern regional ecosystems
-  High value regrowth vegetation that is a Least Concern regional ecosystem
-  Remnant Vegetation
(Refer to the Vegetation Management Act Regional Ecosystem and Remnant Map also available from the Department of Environment and Resource Management website for further information on these areas)
-  Non-remnant
-  PMAV Category X area
-  Regrowth watercourse (Stream order shown as black number against stream)
-  Other watercourse (Stream order shown as black number against stream where available)
-  Subject Lot
-  Roads
© MapInfo Australia Pty Ltd 2009
-  Cadastral line
Property boundaries shown are provided as a locational aid only.
-  Towns
-  Coordinate entered

Requested By: ANDREW@OBERONIA.COM.AU
Date: 14 Mar 11 Time: 09.30.50

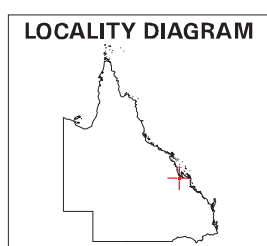
Centered on point position:
Latitude: -22.6692 Longitude: 149.6658 (decimal degrees)

Labels for Vegetation Management Act Essential Regrowth Habitat are centred on the subject lot. Labels correlate to the label field in the attached essential regrowth habitat database.

The high value regrowth, regrowth watercourse, other watercourse, Great Barrier Reef wetland protection area and essential regrowth habitat data shown on this map are representations of the preliminary data.

Some watercourse lines are derived from GeoScience Australia 1:250 000 mapping.

For further information go to the website:
<http://www.derm.qld.gov.au> or contact Vegetation Management, Department of Environment and Resource Management.

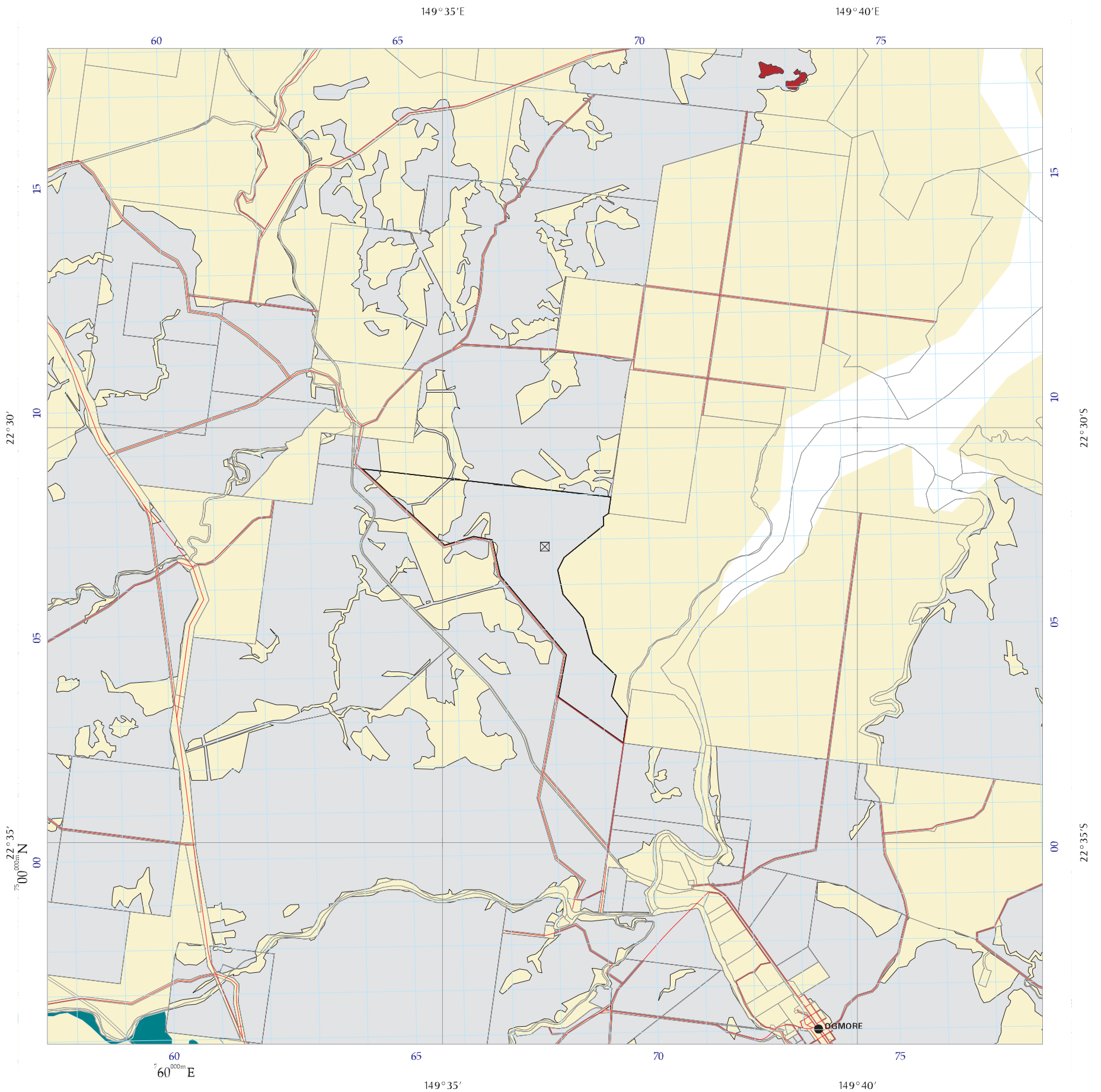


2000 0 2000 m

Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94)

© The State of Queensland, 2011

Areas covered by a Property Map of Assessable Vegetation (PMAV) are represented on the map attached as Page 2 to this Regrowth Vegetation Map and provided with it.



Property Maps of Assessable Vegetation (PMAVs)

Requested By: ANDREW@OBERONIA.COM.AU
Date: 14 Mar 11 Time: 09.30.40

Centered on point position:
Latitude: -22.5238 Longitude: 149.6039 (decimal degrees)

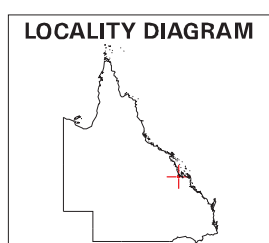
The PMAV data shown on this map are a representation of the data used to create certified PMAVs. Variations may occur between PMAV boundaries and cadastral boundaries. PMAV data incorporates cadastral boundary data as at the time of certification of the PMAV. The cadastral boundaries shown on this map may have shifted relative to the PMAV boundaries as more accurate cadastral boundary data have become available.

All datasets are updated as they become available to provide the most current information as of the date shown on this map.

For further information go to the website:
<http://www.derm.qld.gov.au/vegetation/index.html>
or contact Vegetation Management, Department of Environment and Resource Management.

Property Map of Assessable Vegetation Vegetation Category Area

- Category A area
- Category B area
- Category C area
- Category X area
- Area that is subject to other PMAVs or, if no PMAV exists, a regional ecosystem map, remnant map or regrowth vegetation map
- Subject Lot
- Roads
© MapInfo Australia Pty Ltd 2009
- Cadastral line
Property boundaries shown are provided as a locational aid only.
- Towns
- Coordinate entered



2000 0 2000 m

Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94)

© The State of Queensland, 2011



Property Maps of Assessable Vegetation (PMAVs)

Requested By: ANDREW@OBERONIA.COM.AU
Date: 14 Mar 11 Time: 09.30.52

Centered on point position:
Latitude: -22.6692 Longitude: 149.6658 (decimal degrees)

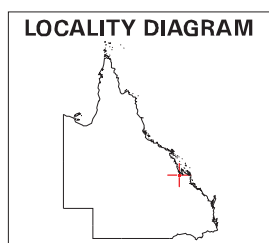
The PMAV data shown on this map are a representation of the data used to create certified PMAVs. Variations may occur between PMAV boundaries and cadastral boundaries. PMAV data incorporates cadastral boundary data as at the time of certification of the PMAV. The cadastral boundaries shown on this map may have shifted relative to the PMAV boundaries as more accurate cadastral boundary data have become available.

All datasets are updated as they become available to provide the most current information as of the date shown on this map.

For further information go to the website:
<http://www.derm.qld.gov.au/vegetation/index.html>
or contact Vegetation Management, Department of Environment and Resource Management.

Property Map of Assessable Vegetation Vegetation Category Area

- Category A area
- Category B area
- Category C area
- Category X area
- Area that is subject to other PMAVs or, if no PMAV exists, a regional ecosystem map, remnant map or regrowth vegetation map
- Subject Lot
- Roads
© MapInfo Australia Pty Ltd 2009
- Cadastral line
Property boundaries shown are provided as a locational aid only.
- Towns
- Coordinate entered



2000 0 2000 m

Horizontal Datum: Geocentric Datum of Australia 1994 (GDA94)

© The State of Queensland, 2011

Appendix C

EPBC Protected Matters Search Tool Results

(Source: DSEWPC, 2011)



EPBC Act Protected Matters Report: Coordinates

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

You may wish to print this report for reference before moving to other pages or websites.

Information about the EPBC Act including significance guidelines, forms and application process details can be found at <http://www.environment.gov.au/epbc/assessmentsapprovals/index.html>

Report created: 01/03/11 22:35:27



[Summary](#)

[Details](#)

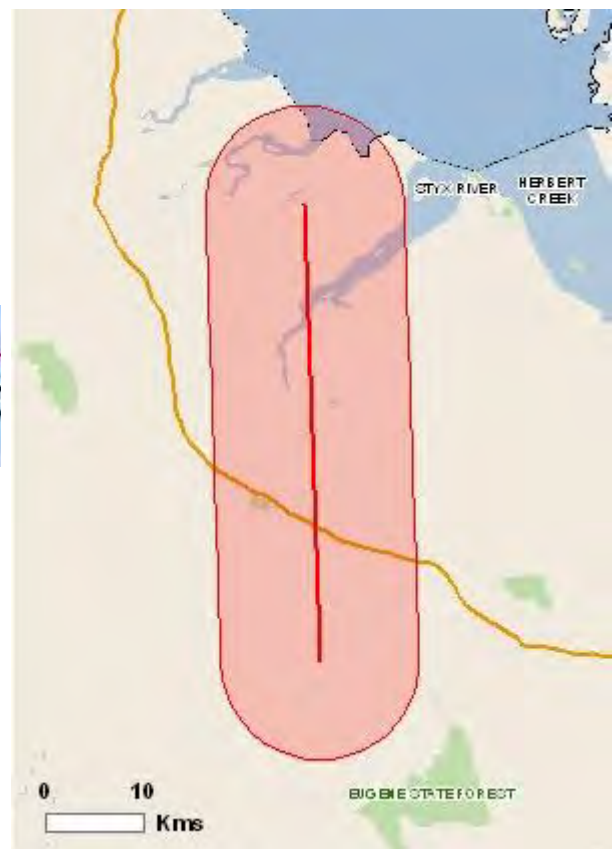
[Matters of NES](#)

[Other matters protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



This map may contain data which are
©Commonwealth of Australia (Geoscience
Australia), ©PSMA 2010

[Coordinates](#)

Buffer: 10Km

Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance - see <http://www.environment.gov.au/epbc/assessmentsapprovals/guidelines/index.html>.

World Heritage Properties:	1
National Heritage Places:	1
Wetlands of International Significance (Ramsar Wetlands):	None
Great Barrier Reef Marine Park:	Relevant
Commonwealth Marine Areas:	None
Threatened Ecological Communities:	3
Threatened Species:	28
Migratory Species:	35

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage/index.html>

Please note that the current dataset on Commonwealth land is not complete. Further information on Commonwealth land would need to be obtained from relevant sources including Commonwealth agencies, local agencies, and land tenure maps.

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species. Information on EPBC Act permit requirements and application forms can be found at <http://www.environment.gov.au/epbc/permits/index.html>.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	76

Whales and Other Cetaceans:	12
Critical Habitats:	None
Commonwealth Reserves:	None

Report Summary for Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

Place on the RNE:	2
State and Territory Reserves:	4
Regional Forest Agreements:	None
Invasive Species:	13
Nationally Important Wetlands:	1

Details

Matters of National Environmental Significance

World Heritage Properties [\[Resource Information \]](#)

Name	Status
Great Barrier Reef QLD	Declared property

National Heritage Places [\[Resource Information \]](#)

Name	Status
------	--------

Natural

Great Barrier Reef QLD	Listed place
--	--------------

Great Barrier Reef Marine Park [\[Resource Information \]](#)

Zone Type	Zone Name	IUCN
Marine National Park	MNP-21-1146	II
General Use	GU-19-6010	VI

Threatened Ecological Communities [\[Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Brigalow (Acacia harpophylla dominant and co-dominant)	Endangered	Community known to occur within area
Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin	Endangered	Community may occur within area
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Community likely to occur within area

Threatened Species [\[Resource Information \]](#)

Name	Status	Type of Presence
------	--------	------------------

BIRDS

[Epthianura crocea macgregori](#)

Yellow Chat (Dawson) [67090] Critically Endangered Species or species habitat may occur within area

[Erythrotriorchis radiatus](#)

Red Goshawk [942] Vulnerable Species or species habitat likely to occur within area

[Geophaps scripta scripta](#)

Squatter Pigeon (southern) [64440] Vulnerable Species or species habitat likely to occur within area

[Macronectes giganteus](#)

Southern Giant-Petrel [1060] Endangered Species or species habitat may occur within area

[Neochmia ruficauda ruficauda](#)

Star Finch (eastern), Star Finch (southern) [26027] Endangered Species or species habitat likely to occur within area

[Pterodroma neglecta neglecta](#)

Kermadec Petrel (western) [64450] Vulnerable Species or species habitat may occur within area

[Rostratula australis](#)

Australian Painted Snipe [77037] Vulnerable Species or species habitat may occur within area

MAMMALS[Balaenoptera musculus](#)

Blue Whale [36] Endangered Species or species habitat may occur within area

[Chalinolobus dwyeri](#)

Large-eared Pied Bat, Large Pied Bat [183] Vulnerable Species or species habitat may occur within area

[Dasyurus hallucatus](#)

Northern Quoll [331] Endangered Species or species habitat likely to occur within area

[Megaptera novaeangliae](#)

Humpback Whale [38] Vulnerable Congregation or aggregation known to occur within area

[Nyctophilus timoriensis \(South-eastern form\)](#)

Greater Long-eared Bat, South-eastern Long-eared Bat [66888] Vulnerable Species or species habitat may occur within area

[Pteropus conspicillatus](#)

Spectacled Flying-fox [185] Vulnerable Species or species habitat may occur within area

[Xeromys myoides](#)

Water Mouse, False Water Rat [66] Vulnerable Species or species habitat likely to occur within area

OTHER[Cycas ophiolitica](#)

[55797] Endangered Species or species habitat likely to occur within area

PLANTS[Leucopogon cuspidatus](#)

[9739] Vulnerable Species or species habitat likely to occur within area

REPTILES[Caretta caretta](#)

Loggerhead Turtle [1763] Endangered Species or species habitat likely to occur within area

Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat likely to occur within area
Denisonia maculata Ornamental Snake [1193]	Vulnerable	Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat likely to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat likely to occur within area
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Rheodytes leukops Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle [1761]	Vulnerable	Species or species habitat may occur within area
SHARKS		
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Migratory Species		[Resource Information]
Name	Status	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat may occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
Sterna albifrons Little Tern [813]		Species or species habitat may occur within area
Migratory Marine Species		
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area

Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat likely to occur within area
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Dugong dugon Dugong [28]		Species or species habitat likely to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat likely to occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Orcaella brevirostris Irrawaddy Dolphin [45]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat may occur within area
Migratory Terrestrial Species		
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat may occur within area
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Breeding likely to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely to occur within area

Migratory Wetlands Species

[Ardea alba](#)

Great Egret, White Egret
[59541]

Species or species habitat may occur within area

[Ardea ibis](#)

Cattle Egret [59542]

Species or species habitat may occur within area

[Calidris tenuirostris](#)

Great Knot [862]

Species or species habitat likely to occur within area

[Gallinago hardwickii](#)

Latham's Snipe, Japanese Snipe
[863]

Species or species habitat may occur within area

[Nettapus coromandelianus albigennis](#)

Australian Cotton Pygmy-goose
[25979]

Species or species habitat may occur within area

[Numenius madagascariensis](#)

Eastern Curlew [847]

Species or species habitat likely to occur within area

[Numenius phaeopus](#)

Whimbrel [849]

Species or species habitat likely to occur within area

[Rostratula benghalensis s. lat.](#)

Painted Snipe [889]

Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species

[Resource Information]

Name

Status

Type of Presence

Birds

[Anseranas semipalmata](#)

Magpie Goose [978]

Species or species habitat may occur within area

[Apus pacificus](#)

Fork-tailed Swift [678]

Species or species habitat may occur within area

[Ardea alba](#)

Great Egret, White Egret
[59541]

Species or species habitat may occur within area

[Ardea ibis](#)

Cattle Egret [59542]

Species or species habitat may occur within area

[Calidris tenuirostris](#)

Great Knot [862]

Species or species habitat likely to occur within area

[Gallinago hardwickii](#)

Latham's Snipe, Japanese Snipe
[863]

Species or species habitat may occur within area

[Haliaeetus leucogaster](#)

White-bellied Sea-Eagle [943]

Species or species habitat likely to occur within area

[Hirundapus caudacutus](#)

White-throated Needletail [682]

Species or species habitat may occur within area

[Hirundo rustica](#)

Barn Swallow [662]

Species or species habitat may occur within area

[Macronectes giganteus](#)

Southern Giant-Petrel [1060] Endangered

Species or species habitat may occur within area

Merops ornatus Rainbow Bee-eater [670]	Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]	Species or species habitat may occur within area
Monarcha trivirgatus Spectacled Monarch [610]	Breeding likely to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]	Species or species habitat likely to occur within area
Nettapus coromandelianus albigennis Australian Cotton Pygmy-goose [25979]	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew [847]	Species or species habitat likely to occur within area
Numenius phaeopus Whimbrel [849]	Species or species habitat likely to occur within area
Rostratula benghalensis s. lat. Painted Snipe [889]	Species or species habitat may occur within area
Sterna albifrons Little Tern [813]	Species or species habitat may occur within area
Fish	
Acentronura tentaculata Shortpouch Pygmy Pipehorse [66187]	Species or species habitat may occur within area
Campichthys tryoni Tryon's Pipefish [66193]	Species or species habitat may occur within area
Choeroichthys brachysoma Pacific Short-bodied Pipefish, Short-bodied Pipefish [66194]	Species or species habitat may occur within area
Corythoichthys amplexus Fijian Banded Pipefish, Brown-banded Pipefish [66199]	Species or species habitat may occur within area
Corythoichthys flavofasciatus Reticulate Pipefish, Yellow-banded Pipefish, Network Pipefish [66200]	Species or species habitat may occur within area
Corythoichthys haematopterus Reef-top Pipefish [66201]	Species or species habitat may occur within area
Corythoichthys intestinalis Australian Messmate Pipefish, Banded Pipefish [66202]	Species or species habitat may occur within area
Corythoichthys ocellatus Orange-spotted Pipefish, Ocellated Pipefish [66203]	Species or species habitat may occur within area
Corythoichthys paxtoni Paxton's Pipefish [66204]	Species or species habitat may occur within area
Corythoichthys schultzi Schultz's Pipefish [66205]	Species or species habitat may occur within area
Doryrhamphus excisus Bluestripe Pipefish, Indian Blue-stripe Pipefish, Pacific	Species or species habitat may occur within area

Blue-stripe Pipefish [66211] Festucalex cinctus	
Girdled Pipefish [66214] Filicampus tigris	Species or species habitat may occur within area
Tiger Pipefish [66217] Halicampus dunckeri	Species or species habitat may occur within area
Red-hair Pipefish, Duncker's Pipefish [66220] Halicampus grayi	Species or species habitat may occur within area
Mud Pipefish, Gray's Pipefish [66221] Halicampus nitidus	Species or species habitat may occur within area
Glittering Pipefish [66224] Halicampus spinirostris	Species or species habitat may occur within area
Spiny-snout Pipefish [66225] Hippichthys cyanospilos	Species or species habitat may occur within area
Blue-speckled Pipefish, Blue-spotted Pipefish [66228] Hippichthys heptagonus	Species or species habitat may occur within area
Madura Pipefish, Reticulated Freshwater Pipefish [66229] Hippichthys penicillus	Species or species habitat may occur within area
Beady Pipefish, Steep-nosed Pipefish [66231] Hippocampus bargibanti	Species or species habitat may occur within area
Pygmy Seahorse [66721] Hippocampus kuda	Species or species habitat may occur within area
Spotted Seahorse, Yellow Seahorse [66237] Hippocampus planifrons	Species or species habitat may occur within area
Flat-face Seahorse [66238] Hippocampus zebra	Species or species habitat may occur within area
Zebra Seahorse [66241] Lissocampus runa	Species or species habitat may occur within area
Javelin Pipefish [66251] Micrognathus andersonii	Species or species habitat may occur within area
Anderson's Pipefish, Shortnose Pipefish [66253] Micrognathus brevisrostris	Species or species habitat may occur within area
thorntail Pipefish, Thorn-tailed Pipefish [66254] Nannocampus pictus	Species or species habitat may occur within area
Painted Pipefish, Reef Pipefish [66263] Solegnathus hardwickii	Species or species habitat may occur within area
Pallid Pipehorse, Hardwick's Pipehorse [66272] Solenostomus cyanopterus	Species or species habitat may occur within area
Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183] Solenostomus paegnius	Species or species habitat may occur within area
Rough-snout Ghost Pipefish	Species or species habitat may occur within area

[68425]

[Solenostomus paradoxus](#)

Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]

Species or species habitat may occur within area

[Syngnathoides biaculeatus](#)

Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]

Species or species habitat may occur within area

[Trachyrhamphus bicoarctatus](#)

Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]

Species or species habitat may occur within area

Mammals

[Dugong dugon](#)

Dugong [28]

Species or species habitat likely to occur within area

Reptiles

[Acalyptophis peronii](#)

Horned Seasnake [1114]

Species or species habitat may occur within area

[Aipysurus duboisii](#)

Dubois' Seasnake [1116]

Species or species habitat may occur within area

[Aipysurus eydouxii](#)

Spine-tailed Seasnake [1117]

Species or species habitat may occur within area

[Aipysurus laevis](#)

Olive Seasnake [1120]

Species or species habitat may occur within area

[Astrotia stokesii](#)

Stokes' Seasnake [1122]

Species or species habitat may occur within area

[Caretta caretta](#)

Loggerhead Turtle [1763] Endangered

Species or species habitat likely to occur within area

[Chelonia mydas](#)

Green Turtle [1765] Vulnerable

Species or species habitat likely to occur within area

[Crocodylus porosus](#)

Salt-water Crocodile, Estuarine Crocodile [1774]

Species or species habitat likely to occur within area

[Dermochelys coriacea](#)

Leatherback Turtle, LeatheryEndangered Turtle, Luth [1768]

Species or species habitat likely to occur within area

[Disteira kingii](#)

Spectacled Seasnake [1123]

Species or species habitat may occur within area

[Disteira major](#)

Olive-headed Seasnake [1124]

Species or species habitat may occur within area

[Emydocephalus annulatus](#)

Turtle-headed Seasnake [1125]

Species or species habitat may occur within area

[Eretmochelys imbricata](#)

Hawksbill Turtle [1766] Vulnerable

Species or species habitat likely to occur within area

[Hydrophis elegans](#)

Elegant Seasnake [1104]

Species or species habitat may occur within area

[Hydrophis mcdowellii](#)

null [25926]

Species or species habitat may occur within area

Hydrophis ornatus a seasnake [1111]		Species or species habitat may occur within area
Lapemis hardwickii Spine-bellied Seasnake [1113]		Species or species habitat may occur within area
Laticauda colubrina a sea krait [1092]		Species or species habitat may occur within area
Laticauda laticaudata a sea krait [1093]		Species or species habitat may occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area

Whales and Other Cetaceans [[Resource Information](#)]

Name	Status	Type of Presence
------	--------	------------------

Mammals

Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Congregation or aggregation known to occur within area
Orcaella brevirostris Irrawaddy Dolphin [45]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat may occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Extra Information

Places on the RNE	[Resource Information]
-------------------	--

Note that not all Indigenous sites may be listed.

Name	Status
Natural	
Great Barrier Reef Region QLD	Registered

Historic	
Newport Meatworks Site (former) QLD	Indicative Place

State and Territory Reserves **[Resource Information]**

Great Barrier Reef Coast, QLD
Newport, QLD
Tooloombah Creek, QLD
Broad Sound, QLD

Invasive Species **[Resource Information]**

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

Name	Status	Type of Presence
------	--------	------------------

Mammals

Capra hircus Goat [2]		Species or species habitat may occur within area
--	--	--

Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
--	--	--

Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
--	--	--

Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
--	--	--

Plants

Acacia nilotica subsp. indica Prickly Acacia [6196]		Species or species habitat may occur within area
--	--	--

Alternanthera philoxeroides Alligator Weed [11620]		Species or species habitat may occur within area
---	--	--

Cryptostegia grandiflora Rubber Vine, Rubbervine, India Rubber Vine, India Rubbervine, Palay Rubbervine, Purple Allamanda [18913]		Species or species habitat likely to occur within area
--	--	--

Hymenachne amplexicaulis Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754]		Species or species habitat likely to occur within area
---	--	--

Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered		Species or species habitat likely to occur within area
--	--	--

Lantana, Red Flowered Lantana,
Red-Flowered Sage, White
Sage, Wild Sage [10892]

[Parkinsonia aculeata](#)

Parkinsonia, Jerusalem Thorn,
Jelly Bean Tree, Horse Bean
[12301]

[Parthenium hysterophorus](#)

Parthenium Weed, Bitter Weed,
Carrot Grass, False Ragweed
[19566]

[Prosopis spp.](#)

Mesquite, Algaroba [68407]

[Salvinia molesta](#)

Salvinia, Giant Salvinia,
Aquarium Watermoss, Kariba
Weed [13665]

Species or species habitat may occur within area

Species or species habitat likely to occur within area

Species or species habitat may occur within area

Species or species habitat may occur within area

Nationally Important Wetlands

[Resource Information]

[Broad Sound, QLD](#)

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants

- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites;
- seals which have only been mapped for breeding sites near the Australian continent.

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

149.65287 -22.41495,149.66709 -22.83139

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Department of Environment, Climate Change and Water, New South Wales](#)
- [-Department of Sustainability and Environment, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment and Natural Resources, South Australia](#)
- [-Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts](#)
- [-Environmental and Resource Management, Queensland](#)
- [-Department of Environment and Conservation, Western Australia](#)
- [-Department of the Environment, Climate Change, Energy and Water](#)
- [-Birds Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-SA Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Atherton and Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [-State Forests of NSW](#)
- Other groups and individuals

Environment Australia is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.



Please feel free to provide feedback via the [Contact Us](#) page.

[Accessibility](#) | [Disclaimer](#) | [Privacy](#) | [© Commonwealth of Australia](#) | [Help](#)

Last updated: Thursday, 16-Sep-2010 09:13:25 EST

[Department of Sustainability, Environment, Water, Population and Communities](#)

GPO Box 787

Canberra ACT 2601 Australia

+61 2 6274 1111 [ABN](#)

| [Australian Government](#) |

Appendix D

Wildlife Online Search Results

(Source: DERM, 2011)



Queensland
Government

Wildlife Online Extract

Search Criteria: Species List for a Defined Area
Species: All
Type: All
Status: All
Records: All
Date: All
Latitude: 22.3703 to 22.8864
Longitude: 149.7151 to 149.6029
Email: andrew@oberonia.com.au
Date submitted: Tuesday 01 Mar 2011 21:48:11
Date extracted: Tuesday 01 Mar 2011 22:01:04

The number of records retrieved = 245

Disclaimer

As the DERM is still in a process of collating and vetting data, it is possible the information given is not complete. The information provided should only be used for the project for which it was requested and it should be appropriately acknowledged as being derived from Wildlife Online when it is used.

The State of Queensland does not invite reliance upon, nor accept responsibility for this information. Persons should satisfy themselves through independent means as to the accuracy and completeness of this information.

No statements, representations or warranties are made about the accuracy or completeness of this information. The State of Queensland disclaims all responsibility for this information and all liability (including without limitation, liability in negligence) for all expenses, losses, damages and costs you may incur as a result of the information being inaccurate or incomplete in any way for any reason.

Feedback about Wildlife Online should be emailed to Wildlife.Online@derm.qld.gov.au

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Bufonidae	<i>Rhinella marina</i>	cane toad	Y			1
animals	birds	Acanthizidae	<i>Gerygone fusca</i>	western gerygone		C		1
animals	birds	Acanthizidae	<i>Gerygone palpebrosa</i>	fairy gerygone		C		1
animals	birds	Acanthizidae	<i>Acanthiza reguloides</i>	buff-rumped thornbill		C		1
animals	birds	Acanthizidae	<i>Chthonicola sagittata</i>	speckled warbler		C		1
animals	birds	Acanthizidae	<i>Sericornis frontalis</i>	white-browed scrubwren		C		1
animals	birds	Accipitridae	<i>Aquila audax</i>	wedge-tailed eagle		C		3
animals	birds	Accipitridae	<i>Milvus migrans</i>	black kite		C		1
animals	birds	Anatidae	<i>Anas gracilis</i>	grey teal		C		1
animals	birds	Anatidae	<i>Tadorna radjah</i>	radjah shelduck		NT		1
animals	birds	Anatidae	<i>Anas superciliosa</i>	Pacific black duck		C		1
animals	birds	Ardeidae	<i>Ardea pacifica</i>	white-necked heron		C		1
animals	birds	Artamidae	<i>Strepera graculina</i>	pieb currawong		C		1
animals	birds	Cacatuidae	<i>Calyptorhynchus banksii</i>	red-tailed black-cockatoo		C		1
animals	birds	Campephagidae	<i>Lalage leucomela</i>	varied triller		C		1
animals	birds	Corcoracidae	<i>Struthidea cinerea</i>	apostlebird		C		1
animals	birds	Corvidae	<i>Corvus sp.</i>					1
animals	birds	Estrildidae	<i>Neochmia ruficauda</i>	star finch		C		1
animals	birds	Estrildidae	<i>Taeniopygia bichenovii</i>	double-barred finch		C		1
animals	birds	Halcyonidae	<i>Dacelo novaeguineae</i>	laughing kookaburra		C		1
animals	birds	Halcyonidae	<i>Todiramphus sanctus</i>	sacred kingfisher		C		1
animals	birds	Maluridae	<i>Malurus lamberti</i>	variegated fairy-wren		C		1
animals	birds	Megapodiidae	<i>Alectura lathamii</i>	Australian brush-turkey		C		2
animals	birds	Meliphagidae	<i>Meliphaga lewinii</i>	Lewin's honeyeater		C		1
animals	birds	Meliphagidae	<i>Lichmera indistincta</i>	brown honeyeater		C		1
animals	birds	Meliphagidae	<i>Acanthagenys rufogularis</i>	spiny-cheeked honeyeater		C		1
animals	birds	Meliphagidae	<i>Melithreptus albogularis</i>	white-throated honeyeater		C		2
animals	birds	Meliphagidae	<i>Manorina flavigula</i>	yellow-throated miner		C		2
animals	birds	Monarchidae	<i>Myiagra rubecula</i>	leaden flycatcher		C		1
animals	birds	Nectariniidae	<i>Dicaeum hirundinaceum</i>	mistletoebird		C		1
animals	birds	Otididae	<i>Ardeotis australis</i>	Australian bustard		C		1
animals	birds	Pachycephalidae	<i>Colluricincla harmonica</i>	grey shrike-thrush		C		1
animals	birds	Pachycephalidae	<i>Pachycephala rufiventris</i>	rufous whistler		C		2
animals	birds	Petroicidae	<i>Petroica rosea</i>	rose robin		C		1
animals	birds	Petroicidae	<i>Microeca fascinans</i>	jacky winter		C		1
animals	birds	Petroicidae	<i>Eopsaltria australis</i>	eastern yellow robin		C		1
animals	birds	Psittacidae	<i>Trichoglossus haematodus moluccanus</i>	rainbow lorikeet		C		1
animals	birds	Rhipiduridae	<i>Rhipidura albiscapa</i>	grey fantail		C		2
animals	birds	Threskiornithidae	<i>Platalea regia</i>	royal spoonbill		C		1
animals	birds	Timaliidae	<i>Zosterops lateralis</i>	silveryeye		C		1
animals	insects	Lycaenidae	<i>Jalmenus eubulus</i>	pale imperial hairstreak		V		1
animals	mammals	Macropodidae	<i>Macropus dorsalis</i>	black-striped wallaby		C		1
animals	mammals	Peramelidae	<i>Isoodon macrourus</i>	northern brown bandicoot		C		1
animals	mammals	Tachyglossidae	<i>Tachyglossus aculeatus</i>	short-beaked echidna		C		1
animals	reptiles	Boidae	<i>Morelia spilota</i>	carpet python		C		1
fungi	sac fungi	Usneaceae	<i>Usnea scabrada subsp. elegans</i>			C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	higher dicots	Acanthaceae	<i>Ruellia tuberosa</i>		Y			2
plants	higher dicots	Acanthaceae	<i>Rostellularia adscendens</i>			C		2
plants	higher dicots	Aizoaceae	<i>Trianthema portulacastrum</i>	black pigweed	Y			1
plants	higher dicots	Amaranthaceae	<i>Achyranthes aspera</i>			C		2
plants	higher dicots	Amaranthaceae	<i>Deeringia amaranthoides</i>	redberry		C		2/2
plants	higher dicots	Amaranthaceae	<i>Alternanthera nana</i>	hairy joyweed		C		2
plants	higher dicots	Apocynaceae	<i>Parsonsia</i>			C		1
plants	higher dicots	Apocynaceae	<i>Wrightia saligna</i>			C		1
plants	higher dicots	Apocynaceae	<i>Cascabela thevetia</i>	yellow oleander	Y			2/2
plants	higher dicots	Apocynaceae	<i>Secamone elliptica</i>			C		1/1
plants	higher dicots	Apocynaceae	<i>Parsonsia lanceolata</i>	northern silkpod		C		2
plants	higher dicots	Apocynaceae	<i>Cryptostegia grandiflora</i>	rubber vine	Y			3/1
plants	higher dicots	Apocynaceae	<i>Parsonsia eucalyptophylla</i>	gargaloo		C		1
plants	higher dicots	Apocynaceae	<i>Asclepias curassavica</i>	red-head cottonbush	Y			1
plants	higher dicots	Apocynaceae	<i>Alstonia constricta</i>	bitterbark		C		1
plants	higher dicots	Apocynaceae	<i>Cynanchum bowmanii</i>	bowman's milkvine		C		1/1
plants	higher dicots	Apocynaceae	<i>Carissa ovata</i>	currantbush		C		2
plants	higher dicots	Asclepiadaceae	<i>Sarcostemma</i>			C		1
plants	higher dicots	Asteraceae	<i>Asteraceae</i>			C		1
plants	higher dicots	Asteraceae	<i>Parthenium hysterophorus</i>	parthenium weed	Y			1
plants	higher dicots	Asteraceae	<i>Verbesina encelioides</i>	crownbeard	Y			1
plants	higher dicots	Asteraceae	<i>Xanthium occidentale</i>		Y			1
plants	higher dicots	Asteraceae	<i>Ageratum conyzoides</i>	billygoat weed	Y			1
plants	higher dicots	Asteraceae	<i>Eriochlamys</i>			C		1
plants	higher dicots	Asteraceae	<i>Eclipta prostrata</i>	white eclipta		C		1/1
plants	higher dicots	Boraginaceae	<i>Ehretia</i>			C		1
plants	higher dicots	Boraginaceae	<i>Heliotropium indicum</i>		Y			1/1
plants	higher dicots	Boraginaceae	<i>Ehretia membranifolia</i>	weeping koda		C		3
plants	higher dicots	Cactaceae	<i>Opuntia stricta</i>		Y			1
plants	higher dicots	Cactaceae	<i>Opuntia tomentosa</i>	velvety tree pear	Y			1
plants	higher dicots	Caesalpiniaceae	<i>Senna barclayana</i>			C		1
plants	higher dicots	Caesalpiniaceae	<i>Lysiphyllum hookeri</i>	Queensland ebony		C		1
plants	higher dicots	Caesalpiniaceae	<i>Senna coronilloides</i>			C		1
plants	higher dicots	Capparaceae	<i>Capparis lasiantha</i>	nipan		C		3
plants	higher dicots	Capparaceae	<i>Apophyllum anomalum</i>	broom bush		C		1
plants	higher dicots	Casuarinaceae	<i>Casuarina cristata</i>	belah		C		1
plants	higher dicots	Casuarinaceae	<i>Allocasuarina luehmannii</i>	bull oak		C		1/1
plants	higher dicots	Casuarinaceae	<i>Allocasuarina torulosa</i>			C		1/1
plants	higher dicots	Celastraceae	<i>Denhamia oleaster</i>			C		2/1
plants	higher dicots	Celastraceae	<i>Maytenus cunninghamii</i>	yellow berry bush		C		1
plants	higher dicots	Celastraceae	<i>Elaeodendron australe var. integrifolium</i>			C		1
plants	higher dicots	Chenopodiaceae	<i>Salsola kali</i>			C		1
plants	higher dicots	Chenopodiaceae	<i>Einadia hastata</i>			C		1
plants	higher dicots	Chenopodiaceae	<i>Maireana microphylla</i>			C		1
plants	higher dicots	Chenopodiaceae	<i>Enchylaena tomentosa</i>			C		3
plants	higher dicots	Combretaceae	<i>Terminalia oblongata</i>			C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	higher dicots	Combretaceae	<i>Terminalia porphyrocarpa</i>			C		1/1
plants	higher dicots	Convolvulaceae	<i>Bonamia media</i>			C		1/1
plants	higher dicots	Convolvulaceae	<i>Evolvulus alsinoides</i>			C		1
plants	higher dicots	Convolvulaceae	<i>Ipomoea carnea subsp. fistulosa</i>		Y			1/1
plants	higher dicots	Cucurbitaceae	<i>Diplocyclos palmatus</i>			C		1
plants	higher dicots	Ebenaceae	<i>Diospyros humilis</i>	small-leaved ebony		C		1
plants	higher dicots	Erythroxylaceae	<i>Erythroxylum australe</i>	cocaine tree		C		1
plants	higher dicots	Euphorbiaceae	<i>Euphorbiaceae</i>			C		1
plants	higher dicots	Euphorbiaceae	<i>Acalypha capillipes</i>	small-leaved acalypha		C		1
plants	higher dicots	Euphorbiaceae	<i>Excoecaria dallachyana</i>	scrub poison tree		C		1
plants	higher dicots	Euphorbiaceae	<i>Croton phebaliooides</i>	narrow-leaved croton		C		1
plants	higher dicots	Fabaceae	<i>Indigofera</i>			C		1
plants	higher dicots	Fabaceae	<i>Stylosanthes</i>			C		1
plants	higher dicots	Fabaceae	<i>Hovea longipes</i>	brush hovea		C		1
plants	higher dicots	Fabaceae	<i>Macroptilium lathyroides</i>		Y			1/1
plants	higher dicots	Fabaceae	<i>Austrostenisia blackii var. blackii</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Crotalaria incana subsp. incana</i>		Y			1/1
plants	higher dicots	Fabaceae	<i>Desmodium campylocaulon</i>			C		1
plants	higher dicots	Goodeniaceae	<i>Velleia pubescens</i>			C		1/1
plants	higher dicots	Goodeniaceae	<i>Brunonia australis</i>	blue pincushion		C		1
plants	higher dicots	Gyrostemonaceae	<i>Codonocarpus attenuatus</i>			C		1
plants	higher dicots	Lamiaceae	<i>Lamiaceae</i>			C		1
plants	higher dicots	Lamiaceae	<i>Spartothamnella juncea</i>	native broom		C		1
plants	higher dicots	Lamiaceae	<i>Clerodendrum floribundum</i>			C		1
plants	higher dicots	Lamiaceae	<i>Pityrodia salviifolia</i>	pityrodia		C		1/1
plants	higher dicots	Lamiaceae	<i>Salvia reflexa</i>		Y			1
plants	higher dicots	Lamiaceae	<i>Glossocarya hemiderma</i>			C		1
plants	higher dicots	Lamiaceae	<i>Vitex melicopea</i>			C		1/1
plants	higher dicots	Lentibulariaceae	<i>Utricularia aurea</i>	golden bladderwort		C		1/1
plants	higher dicots	Loganiaceae	<i>Strychnos psilosperma</i>	strychnine tree		C		1
plants	higher dicots	Loranthaceae	<i>Amyema quandang</i>			C		1
plants	higher dicots	Lythraceae	<i>Rotala mexicana</i>			C		1/1
plants	higher dicots	Malvaceae	<i>Sida</i>			C		2
plants	higher dicots	Malvaceae	<i>Abutilon</i>			C		1
plants	higher dicots	Malvaceae	<i>Sida corrugata</i>			C		3/1
plants	higher dicots	Malvaceae	<i>Abutilon oxycarpum</i>			C		1
plants	higher dicots	Malvaceae	<i>Sida hackettiana</i>			C		2
plants	higher dicots	Malvaceae	<i>Sida cordifolia</i>		Y			1
plants	higher dicots	Malvaceae	<i>Hibiscus</i>			C		1
plants	higher dicots	Malvaceae	<i>Hibiscus divaricatus</i>			C		1/1
plants	higher dicots	Malvaceae	<i>Sida sp. (Greenvale R.J.Fensham 1150)</i>			C		1/1
plants	higher dicots	Malvaceae	<i>Hibiscus phyllochlaenus</i>			C		1/1
plants	higher dicots	Menyanthaceae	<i>Nymphoides indica</i>	water snowflake		C		1/1
plants	higher dicots	Mimosaceae	<i>Albizia lebbek</i>	Indian siris		C		1/1
plants	higher dicots	Mimosaceae	<i>Acacia fasciculifera</i>	scaly bark		C		1
plants	higher dicots	Mimosaceae	<i>Archidendropsis thozetiana</i>			C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	higher dicots	Mimosaceae	<i>Acacia crassa subsp. longicoma</i>			C		3/3
plants	higher dicots	Mimosaceae	<i>Acacia crassa subsp. crassa</i>			C		1/1
plants	higher dicots	Mimosaceae	<i>Acacia harpophylla</i>	brigalow		C		3
plants	higher dicots	Moraceae	<i>Ficus opposita</i>			C		1
plants	higher dicots	Myoporaceae	<i>Myoporum montanum</i>	boobiialla		C		1/1
plants	higher dicots	Myoporaceae	<i>Eremophila deserti</i>			C		2/1
plants	higher dicots	Myoporaceae	<i>Myoporum acuminatum</i>	coastal boobiialla		C		1
plants	higher dicots	Myoporaceae	<i>Eremophila mitchellii</i>			C		1
plants	higher dicots	Myrtaceae	<i>Eucalyptus platyphylla</i>	poplar gum		C		1
plants	higher dicots	Myrtaceae	<i>Melaleuca viminalis</i>			C		1/1
plants	higher dicots	Myrtaceae	<i>Eucalyptus cambageana</i>	Dawson gum		C		1
plants	higher dicots	Myrtaceae	<i>Corymbia tessellaris</i>	Moreton Bay ash		C		1
plants	higher dicots	Myrtaceae	<i>Eucalyptus populnea</i>	poplar box		C		1
plants	higher dicots	Myrtaceae	<i>Eucalyptus crebra</i>	narrow-leaved red ironbark		C		3/1
plants	higher dicots	Oleaceae	<i>Notelaea microcarpa</i>			C		1
plants	higher dicots	Oleaceae	<i>Jasminum didymum subsp. racemosum</i>			C		1
plants	higher dicots	Onagraceae	<i>Ludwigia octovalvis</i>	willow primrose		C		1/1
plants	higher dicots	Passifloraceae	<i>Passiflora foetida</i>		Y			1/1
plants	higher dicots	Passifloraceae	<i>Passiflora aurantia</i>			C		1
plants	higher dicots	Phyllanthaceae	<i>Flueggea leucopyrus</i>			C		1
plants	higher dicots	Phyllanthaceae	<i>Breynia oblongifolia</i>			C		2
plants	higher dicots	Pittosporaceae	<i>Pittosporum spinescens</i>			C		1
plants	higher dicots	Polygonaceae	<i>Antigonon leptopus</i>		Y			1/1
plants	higher dicots	Portulacaceae	<i>Portulaca oleracea</i>	pigweed	Y			1
plants	higher dicots	Portulacaceae	<i>Portulaca</i>			C		1
plants	higher dicots	Proteaceae	<i>Grevillea parallela</i>			C		1
plants	higher dicots	Rhamnaceae	<i>Alphitonia excelsa</i>	soap tree		C		1/1
plants	higher dicots	Rhamnaceae	<i>Alphitonia pomaderoides</i>			C		1
plants	higher dicots	Rubiaceae	<i>Spermacoce</i>			C		1
plants	higher dicots	Rubiaceae	<i>Psydrax odorata</i>			C		1
plants	higher dicots	Rubiaceae	<i>Psydrax attenuata</i>			C		1
plants	higher dicots	Rubiaceae	<i>Pavetta australiensis var. australiensis</i>			C		1/1
plants	higher dicots	Rubiaceae	<i>Everistia vacciniifolia</i>			C		1
plants	higher dicots	Rubiaceae	<i>Triflorensia ixoroides</i>			C		1
plants	higher dicots	Rutaceae	<i>Citrus glauca</i>			C		1
plants	higher dicots	Rutaceae	<i>Flindersia australis</i>	crow's ash		C		1
plants	higher dicots	Rutaceae	<i>Geijera parviflora</i>	wilga		C		1
plants	higher dicots	Rutaceae	<i>Geijera salicifolia</i>	brush wilga		C		1/1
plants	higher dicots	Santalaceae	<i>Exocarpos latifolius</i>			C		1
plants	higher dicots	Santalaceae	<i>Santalum lanceolatum</i>			C		2
plants	higher dicots	Sapindaceae	<i>Alectryon connatus</i>	grey birds-eye		C		1
plants	higher dicots	Sapindaceae	<i>Alectryon diversifolius</i>	scrub boonaree		C		3
plants	higher dicots	Sapindaceae	<i>Atalaya hemiglauca</i>			C		1
plants	higher dicots	Sapotaceae	<i>Planchonella cotinifolia</i>			C		1
plants	higher dicots	Scrophulariaceae	<i>Scoparia dulcis</i>	Scoparia	Y			2/1
plants	higher dicots	Simaroubaceae	<i>Samadera sp. (Dam Creek T.S.Ryan 1006)</i>			C		2/2

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	higher dicots	Solanaceae	<i>Solanum</i>			C		1
plants	higher dicots	Solanaceae	<i>Solanum stelligerum</i>	devil's needles		C		1
plants	higher dicots	Solanaceae	<i>Solanum elachophyllum</i>			E		1
plants	higher dicots	Solanaceae	<i>Solanum ellipticum</i>	potato bush		C		1/1
plants	higher dicots	Solanaceae	<i>Solanum esuriale</i>	quena		C		1
plants	higher dicots	Sparrmanniaceae	<i>Grewia latifolia</i>	dysentery plant		C		1
plants	higher dicots	Sparrmanniaceae	<i>Triumfetta rhomboidea</i>	chinese burr	Y			1/1
plants	higher dicots	Sterculiaceae	<i>Sterculia quadrifida</i>	peanut tree		C		1/1
plants	higher dicots	Sterculiaceae	<i>Brachychiton australis</i>	broad-leaved bottle tree		C		1
plants	higher dicots	Sterculiaceae	<i>Brachychiton rupestris</i>			C		1
plants	higher dicots	Stylidiaceae	<i>Stylidium eriorhizum</i>			C		1/1
plants	higher dicots	Ulmaceae	<i>Trema tomentosa var. aspera</i>			C		2/2
plants	higher dicots	Verbenaceae	<i>Stachytarpheta jamaicensis</i>	Jamaica snakeweed	Y			1
plants	higher dicots	Vitaceae	<i>Cayratia</i>			C		1
plants	higher dicots	Vitaceae	<i>Clematicissus opaca</i>			C		1
plants	lower dicots	Aristolochiaceae	<i>Aristolochia pubera var. pubera</i>			C		1/1
plants	lower dicots	Papaveraceae	<i>Argemone ochroleuca subsp. ochroleuca</i>	Mexican poppy	Y			1
plants	monocots	Cyperaceae	<i>Cyperus</i>			C		2
plants	monocots	Cyperaceae	<i>Cyperus fulvus</i>			C		1
plants	monocots	Cyperaceae	<i>Cyperus gracilis</i>			C		1
plants	monocots	Cyperaceae	<i>Cyperus javanicus</i>			C		1/1
plants	monocots	Cyperaceae	<i>Fimbristylis dichotoma</i>	common fringe-rush		C		3/1
plants	monocots	Hydrocharitaceae	<i>Ottelia</i>			C		1/1
plants	monocots	Orchidaceae	<i>Cymbidium canaliculatum</i>			C		1
plants	monocots	Poaceae	<i>Panicum laevinode</i>	pepper grass		C		2/1
plants	monocots	Poaceae	<i>Sorghum halepense</i>	Johnson grass	Y			1/1
plants	monocots	Poaceae	<i>Sporobolus caroli</i>	fairy grass		C		1
plants	monocots	Poaceae	<i>Aristida lazaridis</i>			C		2/1
plants	monocots	Poaceae	<i>Chloris ventricosa</i>	tall chloris		C		1
plants	monocots	Poaceae	<i>Echinochloa colona</i>	awnless barnyard grass	Y			1
plants	monocots	Poaceae	<i>Eragrostis brownii</i>	Brown's lovegrass		C		1
plants	monocots	Poaceae	<i>Eragrostis sororia</i>			C		1
plants	monocots	Poaceae	<i>Pennisetum ciliare</i>		Y			2
plants	monocots	Poaceae	<i>Aristida gracilipes</i>			C		2/1
plants	monocots	Poaceae	<i>Leptochloa digitata</i>			C		1
plants	monocots	Poaceae	<i>Paspalidium distans</i>	shotgrass		C		3/1
plants	monocots	Poaceae	<i>Paspalidium gracile</i>	slender panic		C		1
plants	monocots	Poaceae	<i>Bothriochloa bladhii</i>			C		1
plants	monocots	Poaceae	<i>Bothriochloa pertusa</i>		Y			1
plants	monocots	Poaceae	<i>Cymbopogon refractus</i>	barbed-wire grass		C		2
plants	monocots	Poaceae	<i>Digitaria parviflora</i>			C		1/1
plants	monocots	Poaceae	<i>Leptochloa decipiens</i>			C		1
plants	monocots	Poaceae	<i>Panicum decompositum</i>			C		1
plants	monocots	Poaceae	<i>Sporobolus scabridus</i>			C		2
plants	monocots	Poaceae	<i>Heteropogon contortus</i>	black speargrass		C		1
plants	monocots	Poaceae	<i>Enteropogon acicularis</i>	curly windmill grass		C		2

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	monocots	Poaceae	<i>Sorghum x almum</i>		Y			1
plants	monocots	Poaceae	<i>Chloris inflata</i>	purpletop chloris	Y			1/1
plants	monocots	Poaceae	<i>Eulalia aurea</i>	silky browntop			C	1
plants	monocots	Poaceae	<i>Leptochloa</i>				C	1
plants	monocots	Poaceae	<i>Aristida</i>				C	1
plants	monocots	Poaceae	<i>Panicum</i>				C	1
plants	monocots	Poaceae	<i>Ancistrachne uncinulata</i>	hooky grass			C	1
plants	monocots	Poaceae	<i>Calyptochloa gracillima</i>				C	1
plants	monocots	Poaceae	<i>Dactyloctenium radulans</i>	button grass			C	1
plants	monocots	Poaceae	<i>Eragrostis megalosperma</i>				C	1
plants	monocots	Poaceae	<i>Paspalidium caespitosum</i>	brigalow grass			C	3
plants	monocots	Poaceae	<i>Echinochloa polystachya cv. Amity</i>		Y			1/1
plants	monocots	Poaceae	<i>Megathyrsus maximus var. pubiglumis</i>		Y			1
plants	monocots	Poaceae	<i>Leptochloa decipiens subsp. asthenes</i>				C	1/1
plants	monocots	Poaceae	<i>Bothriochloa decipiens var. decipiens</i>				C	1

CODES

I - Y indicates that the taxon is introduced to Queensland and has naturalised.

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992*. The codes are Extinct in the Wild (PE), Endangered (E), Vulnerable (V), Near Threatened (NT), Least Concern (C) or Not Protected ().

A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999*. The values of EPBC are Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Extinct in the Wild (XW) and Vulnerable (V).

Records – The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens).

This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon.

This number is output as 999 if it equals or exceeds this value.

Appendix E

Flora species recorded from EPC1029

(21 - 25 March 2011)

Family	Taxon	Life Form	Site																															
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Cactaceae	<i>*Opuntia stricta</i>	S			+						+																					+		
Caesalpiniaceae	<i>Lysiphyllum hookeri</i>	ST				+									+			+															+	
Caesalpiniaceae	<i>Senna</i>	S																					+	+							+	+		
Caesalpiniaceae	<i>*Tamarindus indica</i>	ST				+																												
Capparaceae	<i>Apophyllum anomalum</i>	S																														+	+	
Capparaceae	<i>Capparis arborea</i>	S														+																+		
Capparaceae	<i>Capparis canescens</i>	S																									+							
Capparaceae	<i>Capparis lasiantha</i>	S			+	+	+									+						+										+		
Casuarinaceae	<i>Casuarina cristata</i>	T					+															+										+		
Casuarinaceae	<i>Casuarina cunninghamiana</i>	T															+																	
Celastraceae	<i>Denhamia oleaster</i>	S																				+												
Celastraceae	<i>Denhamia pittosporoides</i>	S																						+										
Celastraceae	<i>Maytenus cunninghamii</i>	S			+		+			+																	+				+	+		
Chenopodiaceae	<i>Enchylaena tomentosa</i>	C				+			+																								+	
Chenopodiaceae	<i>Maireana microphylla</i>	C																									+						+	
Chenopodiaceae	<i>Mallotus philippensis</i>	C													+		+					+			+								+	
Chenopodiaceae	<i>Salsola kali</i>	C															+			+														
Chenopodiaceae	<i>Sclerolaena muricata</i>	C																			+													
Combretaceae	<i>Terminalia oblongata</i>	T																				+												
Commelinaceae	<i>Murdannia graminea</i>	F			+																						+							
Convolvulaceae	<i>Evolvulus alsinoides</i>	F	+		+		+				+											+					+					+	+	
Convolvulaceae	<i>*Ipomoea cairica</i>	L													+																			
Convolvulaceae	<i>Operculina</i> sp. AJF1103004	L			+	+	+	+															+	+										
Crassulaceae	<i>*Bryophyllum delagoense</i>	F				+																												
Cyperaceae	<i>Cyperus javanicus</i>	V		+	+					+						+																		+
Cyperaceae	<i>Cyperus</i> sp.	V				+					+											+										+	+	
Cyperaceae	<i>Fimbristylis dichotoma</i>	V			+																		+				+							

Family	Taxon	Life Form	Site																																	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
Myrtaceae	<i>Corymbia tessellaris</i>	T	+					+							+	+	+	+							+											
Myrtaceae	<i>Eucalyptus cambageana</i>	T								+							+					+														
Myrtaceae	<i>Eucalyptus crebra</i>	T			+		+		+	+		+				+	+	+		+			+	+			+	+				+				
Myrtaceae	<i>Eucalyptus exserta</i>	T			+		+												+														+			
Myrtaceae	<i>Eucalyptus melanophloia</i>	T																									+									
Myrtaceae	<i>Eucalyptus moluccana</i>	T					+				+																	+								
Myrtaceae	<i>Eucalyptus platyphylla</i>	T	+	+	+		+		+	+						+													+							
Myrtaceae	<i>Eucalyptus populnea</i>	T			+				+							+												+								
Myrtaceae	<i>Eucalyptus tereticornis</i>	T			+			+				+		+	+		+				+		+	+												
Myrtaceae	<i>Gossia bidwillii</i>	ST														+																				
Myrtaceae	<i>Lophostemon grandiflorus</i>	T													+			+					+	+												
Myrtaceae	<i>Melaleuca bracteata</i>	ST													+	+																				
Myrtaceae	<i>Melaleuca leucadendra</i>	T						+									+								+											
Myrtaceae	<i>Melaleuca trichostachya</i>	ST				+																			+											
Myrtaceae	<i>Melaleuca viminalis</i>	ST		+													+								+											
Myrtaceae	<i>Melaleuca viridiflora</i>	ST		+			+			+									+		+															
Nyctaginaceae	<i>Boerhavia pubescens</i>	F										+																								
Oleaceae	<i>Jasminum didymum</i>	L										+				+							+											+		
Oleaceae	<i>Jasminum simplicifolium</i>	L				+																		+												
Oleaceae	<i>Notelaea microcarpa</i>	S	+									+			+																					
Onagraceae	<i>Ludwigia octovalvis</i>	S			+																													+		
Orchidaceae	<i>Cymbidium canaliculatum</i>	eF					+															+														
Oxalidaceae	* <i>Oxalis corniculata</i>	F										+																					+			
Passifloraceae	* <i>Passiflora foetida</i>	L	+		+		+			+	+																+								+	
Passifloraceae	* <i>Passiflora suberosa</i>	L				+							+																							
Petiveriaceae	* <i>Rivina humilis</i>	F																						+												
Phyllanthaceae	<i>Breynia oblongifolia</i>	S			+	+	+			+				+			+			+		+		+	+								+			

Notes:

* = exotic species

Life form: T = tree; ST = Short tree; S = Shrub; C = Chenopod shrub; G = Grass; F = Herb/Forb; V = Sedge; R = rush or lily; L = Vine; E = Fern; a = aquatic; e = epiphytic; p = parasitic.

Oberonia Botanical Services

PO Box 254 Ferny Hills DC QLD 4055

M: 0402 912 375 **E:** oberonia.botanical@gmail.com

Review History

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	A. Franks	J. Durbin	J. Durbin	J. Durbin	J. Durbin	11/5/2011

© Oberonia Botanical Services 2011

This document is and shall remain the property of Oberonia Botanical Services. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

The conclusions established within this report are based on data, literature and resources available at the time of writing. Every effort has been made to ensure the accuracy and objectivity of the report's data, analysis, conclusions and recommendations. Oberonia Botanical Services makes no representation, undertakes no duty and accepts no responsibility to any third party who may use or rely upon this document or the information.