Conservation
Environment and
Offset Services Pty Ltd

REPORT

Vegetation Management Plan

IRC-BE-VMP-C- 001

Belyando Estate - VMP

Lot 29 SP218555

Revision	Date	Description	Originator	Reviewer
0	1/07/2012	Draft for Review	Darren Maxwell	S. Rodgers
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Table of Contents

Table of Figures

List of Tables

1. Definitions & Abbreviations

1.1. Definitions

Table 1: Definitions

Term	Definition
Project	Isaac Regional Council - Belyando Estate
Study area	Lot 29 SP218555
CEO	Conservation Environment and Offset Services

1.2. Abbreviations

Table 2: Abbreviations

Abbreviation	Description
BOP	Queensland Biodiversity Offset Policy (version 1) 3 October 2011
DBH	Diameter at breast height
Council	Isaac Regional Council
DNRM	Department of Natural Resources and Mines
DEHP	Department of Environment and Heritage Protection
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities
EIS	Environmental impact statement
EP Act	Environmental Protection Act (Qld) 1994
EPBC Act	Environment Protection and Biodiversity Conservation Act (C'wlth) 1999
ESA	Environmentally sensitive area
G	Ground layer in ecological descriptions
HVR	High value regrowth
Integran	Integran infrastructure management
MNES	Matters of national environmental significance
NC Act	Nature Conservation Act (Qld) 1992
NC Reg	Nature Conservation (Wildlife) Regulation (Qld) 2006
RE	Regional ecosystem
MDS	ULDA Moranbah Development Scheme
S	Shrub layer in ecological descriptions
TEC	Threatened ecological community
T1	Tallest layer forming a canopy in ecological descriptions

Abbreviation	Description
T2	Sub-canopy in ecological descriptions
VM Act	Vegetation Management Act (Qld) 1999

2. Introduction

Conservation Environment and Offset Services (CEO) has been commissioned by Isaac Regional Council (Council) to prepare a Vegetation Management Plan (VMP) for Lot 29 SP18555. This report provides a description of the ecological conditions and values observed within Lot 29 SP18555 and addresses the relevant sections of Moranbah Urban Development Area Development Scheme (MDS). Results are based on an initial desktop assessment followed by field survey where vegetation communities, flora and fauna species, habitat values, pest species and offset requirements were determined.

2.1. Purpose and Scope

This Vegetation Management Plan (VMP) is prepared in support of the Belyando Estate Development Application and identifies ecological values at a property scale that are relevant with respect to impacts of proposed development on regulated vegetation, listed species and significant tree specimens as defined in the MDS.

The report addresses the specific rehabilitation requirements contained within the MDS, and also provides a summary of results of any potential impacts to Matters of National Environmental Significance (MNES) regulated under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), potential impacts to state matters regulated under the *Vegetation Management Act Qld 1999* (VM Act) and Nature Conservation Act (Qld) 1992 (NC ACT). These works included:

- Ground-truth and map any threatened ecological communities (TEC), the presence of endangered, vulnerable, or near threatened (EVNT) species under the *Nature Conservation Act 1992* (NC Act) (Queensland Government 1992);
- Ground-truth and map any regional ecosystem (RE) present within the study area;
- Ground truth and map any areas of High Value Regrowth contained within the study area;
- Evaluate habitat quality and indicate likelihood of occurrence of threatened species;
- Report any significant weed or pest infestations;
- Provide site specific recommendations to meet MDS rehabilitation requirements; and
- Provide site specific advice on potential for development to cause impacts on Matters of National Environmental Significance (MNES) if present.

2.1.1 Limitation

The field survey was conducted during June of 2012; EVNT floral species including summer annuals and grasses may not be visible at this time of year. In addition EVNT fauna may be inactive and not readily observed during cooler periods.

Field survey included targeted Tertiary and Quaternary assessments combined with random meander based on desktop assessment of aerial imagery and mapping datasets. Inference of the potential presence of listed species was derived based upon database searches.

Detailed quantitative fauna and flora surveys were not undertaken as part of this assessment. Instead a rapid, non-exhaustive and opportunistic field survey strategy was employed to identify the presence / absence of significant species within the designated time frame and considering the prevailing weather conditions and season at the time of survey. It is highly likely that additional comprehensive assessment would result in additional fauna and flora species being identified within the study area.

3. Site Context

3.1. Location

The study area is identified as Lot 29 on SP1855. The central part of the study area is situated approximately 1.2 km west of the Moranbah Access Road, 2.5 km south west of the township of Moranbah in the locality of Moranbah. The study area is located within the Brigalow Belt North Bioregion, within the subregion of Northern Bowen Basin. The total area of the lot is approximately 104.40 ha. The study area is shown in **Figure 1**.

3.2. Climate

The climate of the region is typical of sub-tropical Queensland. Moranbah has a mean long term (1972 - 2012) annual maximum temperature of 34.0°C and mean annual minimum of 21.9°C (BOM 2012). Mean long term (1972 - 2012) annual rainfall is 614.5 mm and approximately 50% of annual rainfall occurs in the summer months of December, January and February (BOM 2011).

3.3. Geology and Soils

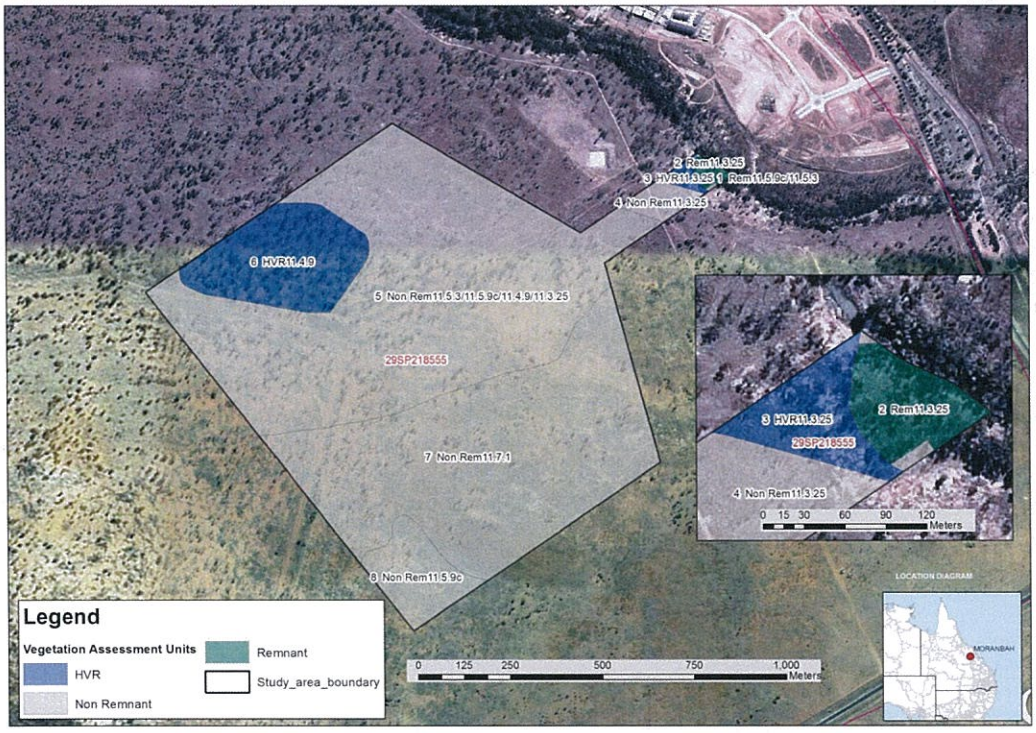
The study area was broadly assessed for geological type for the purposes of classifying vegetation to Regional Ecosystem (RE). Generally the site occurs in a sedimentary landscape.

A narrow band of Quaternary alluvium was found to be located in the east of the site associated with Grosvenor Creek. The remaining parts of the site support either of dissected cainozoic sand plain or cainozoic duricrusts.

Surface geology in the southern part of the main study area was found to consist of cainozoic duricrusts, which were evidenced in higher parts of the site by lateritic outcrops and elsewhere by floating lateritic rock. The northern part of the site was found to support cainozoic sand plains with red sandy to loamy soils.

The Australian Soils Resource Information System shows the study area as supporting chromosol soils, as mapped by the Atlas of Australian Soils (Northcote *et al.* 1960-68). Chromosol soils are described as soils with a strong texture contrast between the A and B horizons, with the latter not strongly acid and not sodic (Isbell 2002). This is broadly consistent with soils occurring in either of Landzone 5 or Landzone 7 under *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland* (Neldner *et al.* 2005).

Figure 1: Study area overview (Rev A)



4. Methodology

The methodology involved a desktop review of ecological databases, aerial photography interpretation followed by a field survey of the study area. An explanation of these activities is outlined in the following sections.

4.1. Desktop and Literature Review

The following information sources were reviewed:

- EPBC Act protected matters search tool (DSEWPaC 2012);
- DERM RE mapping (version 6.1) (DERM 2011a) and essential habitat mapping (version 3.1) (DERM 2011b);
- DERM high value regrowth (HVR) vegetation mapping (version 2.1) (DERM 2011c) and property map of assessable vegetation mapping;
- DERM referable wetland search tool (DERM 2011d);
- DERM wildlife online database (DERM 2011 e); and
- Australian soils resource information system (CSIRO 2011).

The database searches were undertaken using a central coordinate of GDA94 148°1'54.526" E 22°1'1.547"S using a 10km search radius. NC Act searches were undertaken using the same central coordinate and a 5km search radius.

Desktop aerial photography interpretation was used to characterise the site and to identify locations for vegetation assessment.

4.2. Field Survey

The field survey was generally conducted in accordance the *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland* (Neldner *et al.* 2005). Field survey incorporated 1 ha tree counts of specimens with DBH greater than 600 mm within each vegetation unit identified for during desktop assessment after the requirements of MDS.

The survey of the study area was undertaken on the 22nd of June 2012, by ecologist, Darren Maxwell.

4.2 1 Vegetation Community Survey

The study area was stratified into two assessment units based on aerial photography interpretation; assessment units included remnant areas, areas of high value regrowth and non-remnant areas stratified based on pre-clearing regional ecosystem and current tree cover.

Vegetation assessment was undertaken in accordance with the quaternary site assessment methodology, as specified in Neldner *et al.* (2005). Site field data (structural and floristic attributes) were collected and vegetation communities mapped using a GPS. This work included detailed assessment of height, cover and extent of woody vegetation to establish the revised boundaries of remnant vegetation associated with Grosvenor Creek.

This information was used post survey to assess the accuracy of existing DERM (desktop) RE and HVR mapping type and extent and to assess the occurrence of any TECs listed under the EPBC Act within the study area.

Stocking rates for rehabilitation works were assessed using 100m belt transect method with all native woody specimens within the transects counted to establish stocking rates for proposed rehabilitation works.

The status of the remnant vegetation was assessed with reference to the Regional Ecosystem Description Database (REDD) version 6.0b (Queensland Herbarium 2011) and vegetation management status (under the Vegetation Management Act 1999 (VM Act) Queensland Government 1999) assigned.

4.2.2 Threatened Flora and Fauna Survey

Targeted surveys for threatened and regionally significant flora species identified from database searches were undertaken. Surveys were conducted using the Random Meander Technique described by Cropper (1993).

4.2.3 Fauna and Habitat Survey

Opportunistic searches for threatened fauna species (predominantly reptiles and amphibians) were undertaken within identified suitable habitats encountered within the study area. These searches included targeted inspections under logs, rocks and other debris.

Habitat characteristics were assessed and recorded where significant, targeted habitat types included:

- Presence of tree hollows;
- Presence of senescent (old) or dead trees (stags);
- Riverine habitat;
- Density of shrub and ground layers;
- Canopy cover;
- Ridges and upper slopes;
- Fallen bark, timber or logs;
- Leaf litter;
- Decorticating bark;
- Winter flowering species; and
- Termite mounds.

4.2.4 Exotic Flora and Fauna Survey

Environmental and declared pest (as defined by the Land Protection (Pest and Stock Route Management) Act (Qld) 2002 (LP Act) (Queensland Government 2002) and Weeds of National Significance (WONS) populations were noted and their abundance recorded at the time of survey.

4.2.5 Disturbance Survey

Evidence of disturbance at each vegetation community/habitat feature was recorded for type, sensitivity and estimated time of most recent occurrence. The recording of disturbance was also conducted at an opportunistic level where appropriate.

5. Results and Discussion

This section presents the results of studies that were undertaken along with a discussion of key findings. The results are presented in two sections; a desktop and literature review and a field survey.

5.1. Desktop and Literature Review

Data sources used for desktop searches of the study area are listed in section 4.1. A summary of results follows.

5.1.1 Commonwealth Matters

A review of the EPBC protected matters search tool as described in section 4.1 was undertaken; the following sections present a summary of relevant results.

Threatened Ecological Communities

The results of the EPBC protected matters search for TECs in the search area are presented in Table 3.

Table 3: Threatened ecological communities potentially occurring in the search area

Name	Status	Type of Presence[1]
Brigalow (*Acacia harpophylla*) dominant and co-dominant	Endangered	Known to occur within search area
Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin	Endangered	Likely to occur

1: The protected matters search tool is a predictive tool used to identify potential presence based upon the known geographic distribution of the threatened ecological community or species identified or the potential presence of habitat.

Listed Flora

The results of the EPBC protected matters search for listed flora species in the search area are presented in Table 4.

Table 4: EPBC listed flora potentially occurring in the search area

Common Name	Scientific Name	Status	Type of Presence[1]
Marlborough blue cycad	*Cycas ophiolitica*	Endangered	May occur

1: The protected matters search tool is a predictive tool used to identify potential presence based upon the known geographic distribution of the community or species identified or the potential presence of habitat.

Listed Fauna

The results of the EPBC protected matters search for listed fauna species in the search area are presented in Table **5**.

Table **5**: EPBC listed fauna potentially occurring in the search area

Class	Common Name	Scientific Name	Status	Type of Presence[1]
Reptiles	ornamental snake	*Denisonia maculata*	Vulnerable	May occur
	yakka skink	*Egernia rugosa*	Vulnerable	May occur
	Dunmall's snake	*Furina dunmalli*	Vulnerable	May occur
	Allan's lerista	*Lerista allanae*	Endangered	May occur
	brigalow Scaly-foot	*Paradelma orientalis*	Vulnerable	Known to occur
	Fitzroy River turtle	*Rheodytes leukops*	Vulnerable	May occur
Birds	squatter pigeon	*Geophaps scripta scripta*	Vulnerable	Likely to occur
	star finch	*Neochmia ruficauda ruficauda*	Endangered	Likely to occur
	Australian painted snipe	*Rostratula australis*	Vulnerable	Likely to occur
	red goshawk	*Erythrotriorchis radiatus*	Vulnerable	May occur
Mammals	northern quoll	*Dasyurus hallucatus*	Endangered	May occur
	south-eastern long-eared bat	*Nyctophilus corbeni*	Vulnerable	May occur
	koala	*Phascolarctos cinereus*	Vulnerable	May occur

1: The protected matters search tool is a predictive tool used to identify potential presence based upon the known geographic distribution of the community or species identified or the potential presence of habitat.

Migratory Species

The results of the EPBC protected matters search for listed migratory species in the search area are presented in Table **6**.

Table **6**: EPBC listed migratory species potentially occurring in the search area

Class	Common Name	Scientific Name	Type of Presence[1]
Migratory Marine Birds	fork-tailed swift	*Apus pacificus*	May occur
	great egret	*Ardea alba*	May occur
	cattle egret	*Ardea ibis*	May occur
Migratory Terrestrial Species	white-bellied sea-eagle	*Haliaeetus leucogaster*	Likely to occur
	rainbow bee-eater	*Merops ornatus*	Likely to occur

	black-faced monarch	*Monarcha melanopsis*	May occur
	satin flycatcher	*Myiagra cyanoleuca*	Known to occur within search area
Migratory Wetlands Species	great egret	*Ardea alba*	May occur
	cattle egret	*Ardea ibis*	May occur
	Latham's snipe	*Gallinago hardwickii*	May occur
	painted snipe	*Rostratula benghalensis s. lat.*	May occur

1: The protected matters search tool is a predictive tool used to identify potential presence based upon the known geographic distribution of the community or species identified or the potential presence of habitat.

Marine Species

The results of the EPBC protected matters search for listed marine species in the search area are presented in Table **7**.

Table **7**: EPBC listed marine species potentially occurring in the search area

Class	Common Name	Scientific Name	Type of Presence[1]
Birds	fork-tailed swift	*Apus pacificus*	May occur
	great egret	Ardea alba	May occur
	cattle egret	Ardea ibis	May occur
	Latham's snipe	Gallinago hardwickii	May occur
	White-bellied sea-eagle	Haliaeetus leucogaster	May occur
	Rainbow bee-eater	Merops ornatus	May occur
	black-faced monarch	*Monarcha melanopsis*	May occur
	satin flycatcher	*Myiagra cyanoleuca*	Known to occur within search area
	painted snipe	*Rostratula benghalensis s. lat.*	May occur

* Vulnerable; species are listed under a different scientific name on the EPBC Act - Threatened Species list.

1: The protected matters search tool is a predictive tool used to identify potential presence based upon the known geographic distribution of the community or species identified or the potential presence of habitat.

Weeds

The EPBC protected matters search identified Weeds of National Significance (WONS) and other non-native plants that may be present within the search area. These are listed in Table **8**.

Table **8**: Weeds of National Significance potentially occurring in the search area

Common Name	Scientific Name	Type of Presence[1]
prickly acacia	*Acacia nilotica subsp. indica*	Likely to occur
lantana	*Lantana Camara*	Likely to occur
parkinsonia	*Parkinsonia aculeata*	Likely to occur
parthenium weed	*Parthenium hysterophorus*	Likely to occur

1: The protected matters search tool is a predictive tool used to identify potential presence based upon the known geographic distribution of the community or species identified or the potential presence of habitat.

Pest Fauna

All pest fauna identified from the EPBC protected matters search tool are listed in Table **9**.

Table **9**: Pest fauna species potentially occurring in the search area

Common Name	Scientific Name	Type of Presence[1]
cane toad	*Bufo marinus*	Likely to occur
domestic cat	*Felis catus*	Likely to occur
rabbit, European rabbit	*Oryctolagus cuniculus*	Likely to occur
pig	*Sus scrofa*	Likely to occur
red fox, fox	*Vulpes vulpes*	Likely to occur

1: The protected matters search tool is a predictive tool used to identify potential presence based upon the known geographic distribution of the community or species identified or the potential presence of habitat.

Wetlands

No internationally significant (Ramsar) wetlands were identified by the EPBC protected matters search.

5.1.2 State Matters

A summary of relevant desktop search results (Wildlife Online) for EVNT flora and fauna listed under the NC Act is presented in the following sections.

Listed Flora

There are no records of EVNT flora species identified under the NC Act as occurring within the search area.

Listed Fauna

There are two records of EVNT fauna species identified under the NC Act as occurring within the search area, these are listed in **Table 10**.

Table 10: EVNT NC Act Fauna Records

Common Name	Scientific Name	Type of Presence
little pied bat	*Chalinolobus picatus*	Existing record in search area
turquoise parrot	*Neophema pulchella*	Existing record in search area

Regional ecosystems

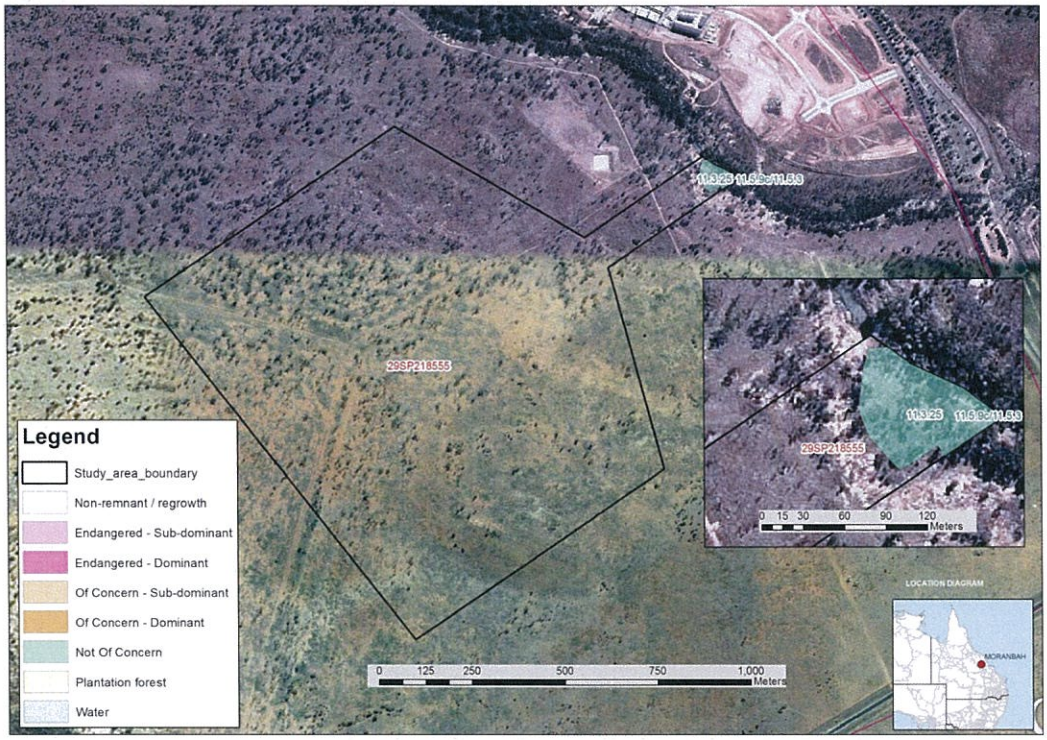
The DERM (2011 6.0b) Regional ecosystem (RE) mapping for the study area is shown in **Figure 2**. Review of this mapping indicates that REs 11.3.25, 11.5.3 and 11.5.9 are either present within the study area or occur immediately adjacent to the study area. This mapping also classifies these RE's as having a VM Act status of Least Concern. Descriptions for RE's identified during the desktop analysis can be found in **Table 11 DERM Regional Ecosystems Mapped as Occurring in or Adjacent to Study Area**. These RE's are represented in DERM mapping as being associated with Grosvenor Creek and they are located on the eastern boundary of the study area.

Table 11: DERM Regional Ecosystems Mapped as Occurring in or Adjacent to Study Area

RE code	VM Act Status	General Description	REDD (Queensland herbarium, 2011) Description
11.3.25	Least Concern	*Eucalyptus tereticornis* or *E. camaldulensis* woodland fringing drainage lines	*Eucalyptus camaldulensis* or *E. tereticornis* open-forest to woodland. Other tree species such as *Casuarina cunninghamiana, E. coolabah, Melaleuca bracteata, Melaleuca viminalis, Livistona* spp. (in north), *Melaleuca* spp. and *Angophora floribunda* are commonly present and may be locally dominant. An open to sparse, tall shrub layer is frequently present dominated by species including *Acacia salicina, A. stenophylla* or *Lysiphyllum carronii*. 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 *Imperata cylindrica, Bothriochloa bladhii, B. ewartiana, Chrysopogon fallax, Cyperus dactylotes, C. difformis, C. exaltatus, C. gracilis, C. iria, C. rigidellus, C. victoriensis, Dichanthium sericeum, Leptochloa digitata, Lomandra longifolia* or *Panicum spp*. Occurs on fringing levees and banks of major rivers and drainage lines of alluvial plains throughout the region. (BVG1M: 16a)
11.5.3	Least Concern	*Eucalyptus populnea* and/or *E. melanophloia* and/or *Corymbia clarksoniana* on Cainozoic sand plains/remnant surfaces	*Eucalyptus populnea +/- E. melanophloia +/- Corymbia clarksoniana +/- C. dallachiana* and *occasionally E. cambageana or E. brownii* dominate the tree layer (14m median height and 11-15m range) woodland. Localised areas may be dominated by *E. melanophloia*, occasionally *E. crebra* and other canopy species. There is generally a distinctive low tree layer (8, 6-11m high) dominated by species such as *Eremophila mitchellii, Geijera parviflora, Archidendropsis basaltica, Erythroxylum australe, Cassia brewsteri, Ventilago viminalis* and occasionally *Allocasuarina luehmannii* or *Callitris glaucophylla*. A low shrub layer (2-6m high) dominated by species such as *Carissa ovata, Erythroxylum australe, Capparis lasiantha* is also often present. Occurs on flat to gently undulating plains formed from Cainozoic

RE code	VM Act Status	General Description	REDD (Queensland herbarium, 2011) Description
			sediments. Associated soils are generally deep texture contrast with thick sandy surface horizons with some deep red earths. (BVG1M: 17a).
11.5.9	Least Concern	*Eucalyptus crebra* and other *Eucalyptus spp.* and *Corymbia spp.* woodland on Cainozoic sand plains/remnant surfaces. Plateaus and broad crests	*Eucalyptus crebra and/or Eucalyptus melanophloia woodland.* Other tree species that may be present and locally dominant include Corymbia *citriodora or C. clarksoniana* sometimes in association with *C. intermedia, C. dallachiana, C. lamprophylla, E. tenuipes, E. exserta, E. cloeziana, E. acmenoides.* The mid layer ranges from absent to a sparse to dense shrubland typically dominated by Acacia spp. (such as *A. excelsa, A. leiocalyx), Petalostigma pubescens, Lysicarpus angustifolius, Alphitonia excelsa* and occasionally *Melaleuca nervosa* (on texture contrast soils). Occurs on plateaus and broad crests of hills and ranges which are formed by Cainozoic sandplains. (BVG1M: 18b)

Figure 2: REs mapped by DERM within the study area (Rev A)



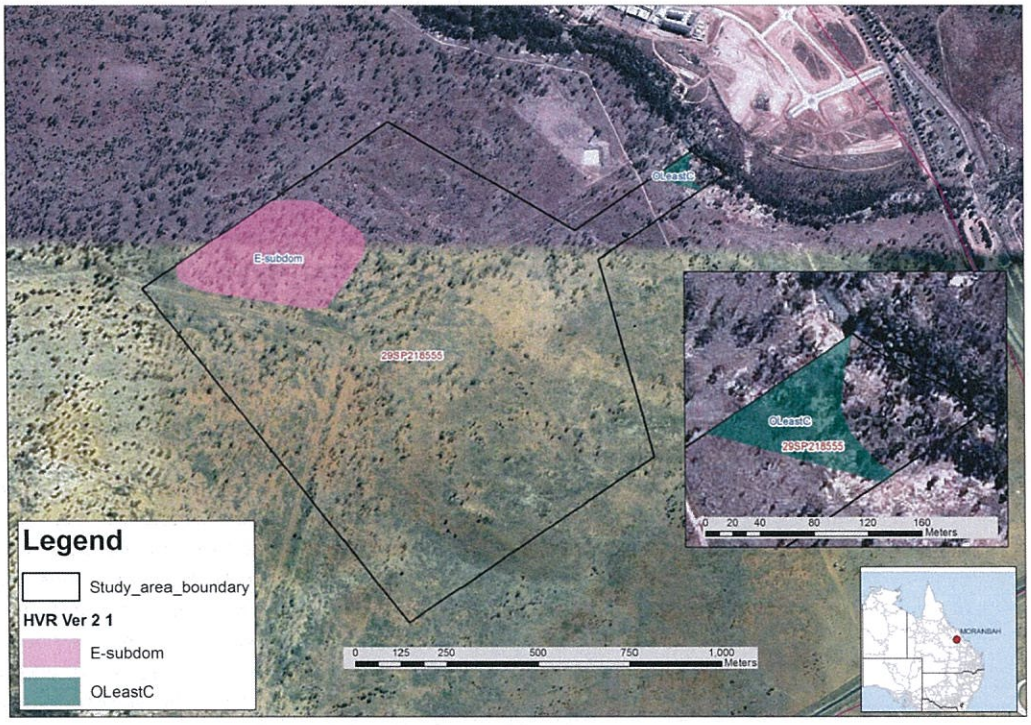
High value regrowth

DERM mapping indicates that high value regrowth (HVR) containing both sub-dominant Endangered and Least Concern RE's is present within the study area See **Figure 3.** Based on DERM pre-clearing mapping in the location of the DERM Mapped HVR the sub-dominant Endangered RE mapped by DERM is RE11.4.9, whilst the Least Concern RE is RE 11.3.25. These RE's are described in **Table 12.**

Table 12: DERM HVR Regional Ecosystems Mapped as Occurring in the Study Area

RE code	VM Act Status	General Description	REDD (Queensland herbarium, 2011) Description
11.3.25	Least Concern	*Eucalyptus tereticornis* or *E. camaldulensis* woodland fringing drainage lines	*Eucalyptus camaldulensis* or *E. tereticornis* open-forest to woodland. Other tree species such as *Casuarina cunninghamiana, E. coolabah, Melaleuca bracteata, Melaleuca viminalis, Livistona* spp. (in north), *Melaleuca* spp. and *Angophora floribunda* are commonly present and may be locally dominant. An open to sparse, tall shrub layer is frequently present dominated by species including *Acacia salicina, A. stenophylla* or *Lysiphyllum carronii*. 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 *Imperata cylindrica, Bothriochloa bladhii, B. ewartiana, Chrysopogon fallax, Cyperus dactylotes, C. difformis, C. exaltatus, C. gracilis, C. iria, C. rigidellus, C. victoriensis, Dichanthium sericeum, Leptochloa digitata, Lomandra longifolia* or *Panicum spp*. Occurs on fringing levees and banks of major rivers and drainage lines of alluvial plains throughout the region. (BVG1M: 16a)
11.4.9	Endangered	*Acacia harpophylla* shrubby open forest to woodland with *Terminalia oblongata* on Cainozoic clay plains	Open-forest, occasionally woodland, dominated by *Acacia harpophylla* usually with a low tree mid-storey of *Terminalia oblongata* and *Eremophila mitchellii. Casuarina cristata* sometimes replaces *Acacia harpophylla* in the overstorey and *Lysiphyllum cunninghamii* sometimes co-dominates. Other low tree or shrub species such as *Alectryon diversifolius, Carissa ovata, Pittosporum spinescens, Ehretia membranifolia, Geijera parviflora* and *Flindersia dissosperma* may occur in the mid-storey or low shrub layer. *Acacia harpophylla* 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)

Figure 3: HVR mapped by DERM within the study area (Rev A)



5.2. Field Survey

5.2.1 Commonwealth Matters

Field survey results concerning matters of national environmental significance are described in the following sections.

Threatened Ecological Communities

No threatened ecological communities (TEC) were recorded within the study area. Whilst *Acacia harpophylla* regrowth was recorded within the central and southern parts of the study area this regrowth lacked the structural elements required to meet the description for the TEC. Further this regrowth is associated with the pre-clearing RE 11.7.1 (*Acacia harpophylla* and/or *Casuarina cristata* and *Eucalyptus thozetiana* or *E. microcarpa* woodland on lower scarp slopes on lateritic duricrust), this is a Least Concern RE and not one of the 16 Queensland RE's that are associated with Brigalow TEC in Queensland.

No grassland or other TEC communities were observed during field studies.

Listed Flora

No flora species listed under the EPBC Act were identified during the field survey.

Listed Fauna

No threatened fauna species listed under the EPBC Act were identified through targeted and opportunistic observations during field survey. However the study area was noted as providing potential habitat for a range of birds and mammals, with numerous potential habitat trees identified during the field survey. Additionally, the presence of watercourses may provide habitat for aquatic fauna.

Migratory Species

No migratory species were identified during the field survey of the study area. However, permanent and semi-permanent billabongs may attract migratory wetland species at various times through the year. It is considered that all migratory species identified through the EPBC protected matters search for the area (listed in Table **6**) have the potential to occur in the study area.

Weeds

No WONS identified in the EPBC protected matters search tool were found in the study area.

5.2.2 State Matters

Field survey results concerning NC Act EVNT listed flora and fauna species are provided in the following sections.

Listed Flora

No EVNT flora species listed under the NC Act were identified during the field survey of the study area.

Other Flora

A Type-A trade restricted plant listed under the *Nature Conservation (Protected Plants) Conservation Plan 2000* (sub-ordinate legislation under the NC Act)) was identified as being present on the property, the Black orchid (*Cymbidium canaliculatum*). This legislation does not prevent clearing of these species, but does restrict trade in these species without a permit. This species was distributed in very low numbers within the study area.

Listed fauna

No EVNT fauna species as listed under the NC Act were identified during the field survey. Whilst the study area is degraded it was found to provide potential habitat for a range of faunal species.

Habitat features included the presence of a riparian corridor, mature (hollow bearing) canopy trees as well as dense tussocks of native perennial grasses and low growing shrubs.

Weeds

The succulent weed *Harrisia martinii* was recorded during field survey. This weed is a Class 2 weed listed in the *Land Protection (Pest and Stock Route Management) Act 2002*. The agricultural weed Mimosa Bush (*Acacia farnesiana*) was also observed on the site. These species occur in only limited numbers within the study area.

The weed species observed in the study area are listed in Table 13.

Table 13: Introduced flora (excluding pasture species) recorded during the field survey of the study area

Common Name	Scientific Name	Status
Harrisia cactus	*Harrisia martinii*	Class 2
Mimosa Bush	*Acacia farnesiana*	Agricultural weed

Pest Fauna

Two, declared pest species under the *Land Protection (Pest and Stock Route Management) Regulation 2003* were observed during field survey, feral pigs (*Sus scrofa*) and fallow dear (*Dama dama*).

Pest fauna species identified during the field survey are listed in **Table 14** below.

Table 14: Pest fauna species identified during the field survey

Common Name	Scientific Name	Occurrence
fallow dear	*Dama dama*	Observed not confirmed
pig	*Sus scrofa*	Identified

Regional Ecosystems

Areas mapped as remnant under DERM RE mapping within the study area were ground-truthed for species composition and spatial extent. Field survey confirmed the presence of the Least Concern RE 11.3.25 occurring in association with Grosvenor Creek in the eastern part of the site. **Table 15** below provides a summary of field survey in this location. Remnant RE11.5.3 mapped in this location was not found to be present. **Figure 4** provides a graphical representation of remnant vegetation cover within the study area.

Table 15: RE ground-truthed in the study area

Site	Type	Structural description	Species composition, structural detail and general description
1&2	Belt transect, tree counts	RE 11.3.25 open forest of *Eucalyptus tereticornis, Melaleuca fluviatilis with Lysiphyllum carronii, Cassia brewsteri, Eucalyptus populnea and Terminalia oblongata*	Narrow band of remnant vegetation located on order 5 stream. T1 consisted of *Eucalyptus tereticornis* and *Melaleuca fluviatilis* forming a distinct but discontinuous canopy 14-18 m tall. A T2 layer (4-8 m) is present consisting of *Melaleuca fluviatilis, Lysiphyllum carronii, Cassia brewsteri, Eucalyptus populnea, Terminalia oblongata, Acacia sparsiflora, Acacia leiocalyx, Acacia salicina* and *Acacia excelsa.* A sparse shrub layer includes seedlings of T1 and T2 species along with *Grewia latifolia, Abutilon oxycarpum, *Acacia farnesiana* and *Carissa ovata.* The ground layer is highly disturbed, dominated by **Megathyrsus maximus* with **Cenchrus ciliaris, *Chloris virgata, Bothriochloa bladhii , Heteropogon contortus, Dichanthium setosum, Dichanthium sericeum, *Sida rhombifolia* and **Macroptilium lathyroides* Cover within each layer was recorded as follows: • T1 60% • T2 60% • S 10% • G 70% Stocking rates per / ha: • T1 150 • T2 1,600 • S 250 • DBH > 600mm 3 Habitat features include hollow bearing stags, nesting and roosting sites, permanent / semipermanent billabong, large woody debris, surface rock and overhanging banks. Disturbance on the site includes a history of mechanical clearing, colonisation by improved pasture species, impacts from introduced grazing animals (cattle and deer) as well as impacts associated with urbanisation including vehicle traffic and in stream refuse.

DERM mapping in this location did not correctly reflect the boundary of remnant vegetation present on the site. The western boundary of RE11.3.25 as shown in DERM mapping extends approximately 20m beyond the remnant vegetation into highly disturbed regrowth with height less than 70% of remnant community, refer to site data for assessment unit 4 for specific details.

No other VM Act remnant vegetation was found to be present on the site.

High Value Regrowth

Desktop study showed DERM HVR as occurring in two locations within the study area.

In the east of the study area adjacent to Grosvenor Creek and adjoining the remnant RE11.3.25, an area of HVR supporting Least Concern RE's was confirmed for species composition and extent. This area included two landzones 5 and 3 and therefore vegetation in this site was found to be regrowth of RE11.3.25 and RE11.5.3.

In the north west of the site a larger area mapped as HVR supporting Endangered Regional Ecosystems was found to be correctly mapped with respect to extent and incorrectly mapped with respect to species composition and associated RE. This area was found to occur on geology consistent with land zone 5 and supporting vegetation with a T1 layer consisting of *Eucalyptus populnea* and a T2 layer comprising a range of species including *Terminalia oblongata, Geijera salicifolia, Psydrax oleifolia, Archidendropsis basaltica, Erythroxylum australe, Cassia brewsteri* and *Corymbia tessellaris*. This vegetation was found to support species composition consistent with the Least Concern RE 11.5.3. **Figure 4** provides a graphical representation of HVR cover within the study area.

No other HVR vegetation was present on the site.

Table 16: HVR ground-truthed in the study area

Site	Type	Structural description	Species composition, structural detail and general description
3	Quaternary assessment and large tree counts	Regrowth of 11.3.25 and 11.5.3 low open forest to woodland of *Eucalyptus tereticornis, Eucalyptus populnea, Lysiphyllum carronii, Cassia brewsteri and Terminalia oblongata*	Narrow band of vegetation located on and adjacent to median flood flow channel of order 5 stream. Emergent layer of *Eucalyptus tereticornis to* 16 m Disturbed T1 consisting of semi-mature and sapling specimens of *Eucalyptus tereticornis, Eucalyptus populnea, Lysiphyllum carronii, Cassia brewsteri and Terminalia oblongata* forming a distinct but discontinuous canopy 6-12 m tall. A spares T2 layer (3-6 m) is present including of *Lysiphyllum carronii, Cassia brewsteri, Terminalia oblongata* and *Acacia excelsa.* A sparse shrub layer includes occasional seedlings of T1 and T2 species along with *Grewia latifolia, Abutilon oxycarpum, *Acacia farnesiana* and *Carissa ovata.* The ground layer is highly disturbed, dominated by **Megathyrsus maximus* with **Cenchrus ciliaris, *Chloris virgata, Bothriochloa bladhii , Heteropogon contortus, Dichanthium setosum, Dichanthium sericeum, *Sida rhombifolia* and **Macroptilium lathyroides* Cover within each layer is as follows: • T1 25% • T2 20% • S > 5%

Site	Type	Structural description	Species composition, structural detail and general description
			• G 40% Stocking rates per / ha: • T1 150 • T2 1,600 • S 250 • DBH > 600mm Nil Habitat features include nesting and roosting sites, permanent, dense thickets of perennial grass and shrubs. Disturbance on the site includes a history of mechanical clearing, colonisation by improved pasture species, impacts from introduced grazing animals (cattle and deer) as well as impacts associated with urbanisation including vehicle traffic and in stream refuse.
6	Two Quaternary sites and surveys of large trees by 100m * 100m quadrate	HVR of Least Concern Regional Ecosystem 11.5.3, woodland to open forest of *Eucalyptus populnea*, Geijera salicifolia *Acacia excelsa*, *Terminalia oblongata* and *Psydrax oleifolia* on undulating sandy plain (Landzone 5).	Disturbed T1 layer to 17m (av. 15m) with cover of 30% consisting of mature and over mature *Eucalyptus populnea.* A T2 layer to 8m was present consisting of Acacia excelsa, *Archidendropsis basaltica, Terminalia oblongata, Psydrax oleifolia, Corymbia dallachiana, Corymbia clarksoniana, Corymbia tessellaris, Lysiphyllum carronii Eremophila mitchellii, Geijera salicifolia, Erythroxylum australe and Cassia brewsteri.* A sparse shrub layer included seedlings of tree species along with *Geijera salicifolia, Erythroxylum australe, Grewia latifolia, Capparis lasiantha* and *Carissa ovata.* The disturbed ground layer included **Cenchrus ciliaris, *Melinis repens, Aristida leptopoda, Austrostipa ramosissima, Dichanthium sericeum, *Megathyrsus maximus* with, **Chloris virgata, Heteropogon contortus, Lomandra sp. (L. patens) and *Sida rhombifolia.* Cover within each layer is as follows: • T1 30% • T2 10% • S 15% • G 70% • Trees with DBH > 600mm 10/ha Habitat features include tussock forming grasses and occasional occurrence of sparse dense low growing shrubs and high abundance of hollow bearing trees. Disturbance on the site includes a history of mechanical clearing, colonisation by improved pasture species, impacts from introduced grazing animals (Cattle and Deer) as well as impacts associated with farm infrastructure.

5.2.3 Non-remnant areas - Large Mature Trees

Non Remnant Areas

The remaining non-remnant, non-HVR parts of the site were assessed for the presence of EVNT species and significant vegetation under MDS. In particular field studies focussed on describing the vegetation present and establishing the distribution and abundance of relic mature and semi-mature tree species with a DBH of greater than 600mm. For this purpose the study area was stratified by pre-clearing regional ecosystem and condition. Surveys for trees with a DBH of greater than 600mm were conducted by recording stocking rates within 100m * 100m representative quadrates, within two replicates per assessment unit.

Results of field studies are provided in **Table 17**, assessment units are shown in **Figure 1**.

Table 17: Survey Results Non-remnant Areas

Site	Type	Structural description	Species composition, structural detail and general description
4	Quaternary assessment and large tree count	Highly disturbed non-remnant regrowth of 11.5.3, low open woodland of *Psydrax oleifolia, Eucalyptus populnea, Corymbia dallachiana, Lysiphyllum carronii, Cassia brewsteri and Terminalia oblongata*	Occasional Emergent layer of *Eucalyptus populnea to* 12 m Disturbed sparse T1 consisting of semi-mature and sapling specimens of *Psydrax oleifolia, Eucalyptus populnea, Corymbia dallachiana, Lysiphyllum carronii, Cassia brewsteri, Archidendropsis basaltica and Terminalia oblongata* forming a distinct but discontinuous canopy 5-9 m tall. No T2 layer present A sparse shrub layer includes occasional seedlings of T1 and T2 species along with *Grewia latifolia, Abutilon oxycarpum* and *Carissa ovata.* The ground layer is highly disturbed, dominated by **Megathyrsus maximus* with **Cenchrus ciliaris, *Chloris virgata* and including *Bothriochloa bladhii, Heteropogon contortus, Dichanthium sericeum, *Sida rhombifolia* and **Macroptilium lathyroides* Cover within each layer is as follows: • T1 20% • S > 5% • G 40% • Trees with DBH > 600mm Nil Stocking rates per / ha: • NA Habitat features include low nesting and roosting sites, permanent, dense thickets of perennial grass and shrubs. Disturbance on the site includes a history of mechanical clearing, colonisation by improved pasture species, impacts from introduced grazing animals (cattle and deer) as well as impacts associated with farm and urban infrastructure and vehicle traffic.

Site	Type	Structural description	Species composition, structural detail and general description
5	Four quaternary sites and surveys of large trees by 100m * 100m quadrate	Disturbed non-remnant regrowth of 11.5.3, open woodland of *Eucalyptus populnea, Eucalyptus crebra, Corymbia dallachiana, Lysiphyllum carronii, Cassia brewsteri, Psydrax oleifolia and Terminalia oblongata*	Occasional Emergent layer of *Eucalyptus populnea to* 16 m Disturbed sparse T1 consisting of semi-mature and sapling specimens of *Eucalyptus populnea, Eucalyptus crebra, Corymbia dallachiana, Corymbia tessellaris, Lysiphyllum carronii, Cassia brewsteri, Archidendropsis basaltica and Terminalia oblongata* forming a distinct but discontinuous canopy 5 -10 m tall. Sparse T2 layer is (not always) present included *Eucalyptus populnea, Eucalyptus crebra, Corymbia dallachiana, Corymbia tessellaris, Lysiphyllum carronii, Cassia brewsteri, Archidendropsis basaltica, Geijera salicifolia, Atalaya hemiglauca and Terminalia oblongata.* A sparse shrub layer includes occasional seedlings of T1 and T2 species along with *Erythroxylum australe, Grewia latifolia, Abutilon oxycarpum* and *Carissa ovata.* The ground layer is highly disturbed, dominated by **Megathyrsus maximus* with **Cenchrus ciliaris, *Melinis repens* and including *Chloris virgata, Bothriochloa bladhii, Heteropogon contortus, Dichanthium sericeum, *Sida rhombifolia* and **Macroptilium lathyroides *Melinis repens, Aristida leptopoda, Austrostipa ramosissima and Dichanthium sericeum.* Cover within each layer is as follows: • T1 15% • T2 10% • S > 5% • G 60% • Trees with DBH > 600mm 3 Stocking rates per / ha: • NA Habitat features include nesting and roosting sites, dense thickets of perennial grass and shrubs, woody debris and occasional hollow bearing tree. Disturbance on the site includes a history of mechanical clearing, colonisation by improved pasture species, impacts from introduced grazing animals (cattle and deer) as well as impacts associated with farm infrastructure.
7	Three quaternary sites and surveys of large trees by 100m * 100m quadrate	Disturbed non-remnant regrowth of RE11.7.1, *Acacia harpophylla, Eucalyptus cambageana, Grevillea striata and Geijera salicifolia.*	Occasional Emergent layer of *Eucalyptus cambageana to* 12 m Disturbed sparse T1 consisting of semi-mature and sapling specimens of *Acacia harpophylla, Eucalyptus cambageana, Atalaya hemiglauca, Grevillea striata, Geijera salicifolia, Lysiphyllum carronii, Cassia brewsteri* and *Archidendropsis basaltica* forming a distinct but discontinuous canopy 3 -6 m tall. An inconsistent shrub layer is present (10 - 40% cover) species

Site	Type	Structural description	Species composition, structural detail and general description
			include *Carissa ovata, Alectryon diversifolius, Maytenus bilocularis, Erythroxylum australe, Grewia latifolia* and *Abutilon oxycarpum.* The ground layer is highly disturbed, dominated by **Cenchrus ciliaris, *Melinis repens* and *Ancistrachne uncinulata* and including *Chloris virgata, Heteropogon contortus, Dichanthium sericeum, *Macroptilium lathyroides, Aristida leptopoda* and *Austrostipa ramosissima.* Cover within each layer is as follows: • T1 15% • S > 10 - 40% • G 60% • Trees with DBH > 600mm 2 Stocking rates per / ha: • NA Habitat features include nesting and roosting sites, dense thickets of perennial grass and shrubs, woody debris and occasional hollow bearing tree. Disturbance on the site includes a history of mechanical clearing, colonisation by improved pasture species, impacts from introduced grazing animals (cattle and deer) as well as impacts associated with farm infrastructure.
8	Two quaternary sites and surveys of large trees by 100m * 100m quadrate	Disturbed non-remnant regrowth with *Eucalyptus populnea, Eucalyptus crebra, Acacia harpophylla, Alectryon diversifolius, Archidendropsis basaltica and Geijera salicifolia.*	Occasional Emergent layer of *Eucalyptus populnea / Eucalyptus crebra to* 10 m. Disturbed low T1 consisting of semi-mature and sapling specimens of *Eucalyptus populnea, Eucalyptus crebra, Acacia harpophylla, Alectryon diversifolius, Geijera salicifolia, Lysiphyllum carronii, Cassia brewsteri* and *Archidendropsis basaltica* forming a distinct but discontinuous canopy 4 -7 m tall. An inconsistent shrub layer is present (10 - 40% cover) species include *Carissa ovata, Alectryon diversifolius, Archidendropsis basaltica, Lysiphyllum carronii and Grewia latifolia.* The ground layer is highly disturbed, dominated by **Cenchrus ciliaris, Themeda triandra, Paspalidium sp., Heteropogon contortus, Dichanthium sericeum, Aristida leptopoda* and *Austrostipa ramosissima.* Cover within each layer is as follows: • T1 10% • S > 10 - 40% • G 60% • Trees with DBH > 600mm 1 Stocking rates per / ha: • NA

Site	Type	Structural description	Species composition, structural detail and general description
			Habitat features include nesting and roosting sites, dense thickets of perennial grass and shrubs, woody debris and occasional hollow bearing tree. Disturbance on the site includes a history of mechanical clearing, colonisation by improved pasture species, impacts from introduced grazing animals (cattle and deer) as well as impacts associated with farm infrastructure.

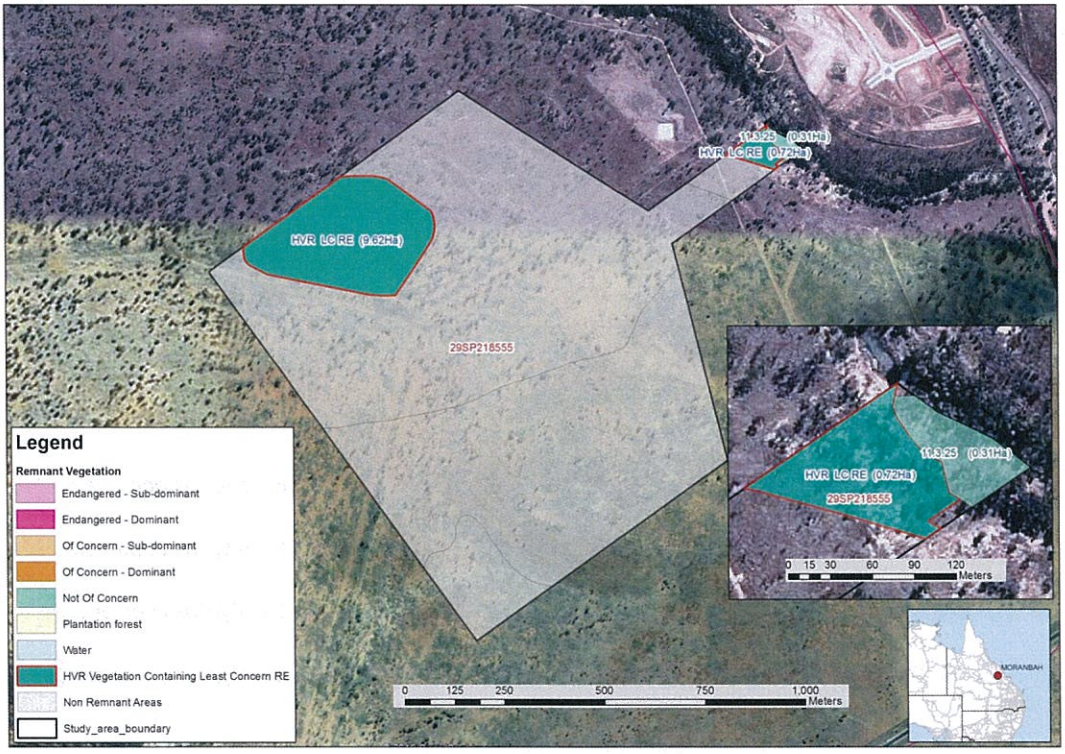
Summary of Findings - Large trees with DBH > 600mm

Field survey of each assessment unit included quantification of large trees with DBH (1 metre above ground) > 600mm. In total the number of large trees as defined in MDS is estimated to be 328. Generally large trees were either of *Eucalyptus populneus* or *Eucalyptus cambageana*. Exceptions to this were 3 large *Melaleuca fluviatilis* specimens located within remnant vegetation on Grosvenor Creek. Table 18 below provides a summary of findings from the survey of large trees.

Table 18: Survey results - large tree survey

Assessment unit	Condition	RE	Area (ha)	Stocking Rate / Ha	Total No.	Species
1&2	Remnant	11.3.25	0.31	3	1	Melaleuca fluviatilis
3	HVR	11.3.25/11.5.3	0.72	0	0	-
4	Non Remnant	11.5.3	1.30	0	0	-
5	Non Remnant	11.5.3	50.70	3	152	*Eucalyptus populneus*
6	HVR	11.5.3	9.61	10	96	*Eucalyptus populneus*
7	Non Remnant	11.7.1	37.18	2	74	*Eucalyptus cambageana*
8	Non Remnant	11.5.9	4.58	1	5	*Eucalyptus populneus*

Figure 4: Vegetation Cover Final (Rev A)



5.3. Summary of MDS Rehabilitation Requirements

The following section provides summary rehabilitation requirements under the MDS that would be required as a consequence of clearing vegetation within the study area

The MDS has specific measures that provide for the provision of offsets or rehabilitation areas where significant vegetation is being cleared for development purposes. The MDS specifies the location of rehabilitation works.

Where significant vegetation is being cleared development will be required to rehabilitate land in the Civic and Open Space Zone specified in MDS and in particular where such fronts Goonyella Road and is adjacent to Grosvenor Creek.

Rehabilitation is to occur in accordance with the following ratios:

(i) High Value Regrowth containing Endangered Regional Ecosystems - 2 for 1 by area.

(ii) All plants within the bed and banks of Grosvenor Creek - 1 for 1 by area.

(iii) All trees with a diameter of equal to or greater than 60cm measured at 1 metre above the ground level - 3 for 1 by number.

Field survey showed no HVR containing Endangered Regional Ecosystems occurs within the study area.

The rehabilitation area for plants occurring within the beds and banks of Grosvenor Creek within the study was taken to be the extent of remnant vegetation RE11.3.25, which by definition occurs on beds and banks of major streams. The watercourse in this location was found to be incised into the landscape with only a narrow area of alluvium and coincident with RE11.3.25. The total rehabilitation area for impacts to significant vegetation within Grosvenor Creek was found to be 0.31 ha. It is understood that proposed rehabilitation area includes both landzone 3 and landzone 5 and the planting guide includes species from adjoining RE11.5.3.

In addition a total of 328 trees with DBH greater than 60cm were found to occur within the study area. Impacts to these trees require rehabilitation of 984 trees under MDS.

In accordance with MDS rehabilitation works must be conducted within the Civic and Open Space Areas (as defined under the MDS). A suitable range of commercially available plant species were found to occur naturally within the study area, however substrates vary and specific species selection for rehabilitation planting should be based on the precise location of the rehabilitation and based on the substrate or substrates that are present within that area.

Table 19 provides a guide for restoration planting of the RE11.3.25. Planting numbers are based on the following initial stocking rates, native tube stocks are the preferred container size, providing economy in cost and vigour of juvenility in planted specimens:

- T1 - 400 per ha
- T2 - 3200 per ha
- S - 1200 per ha
- GL - 1 per m2

It is anticipated that mortality rates for plants in each stratum will be greater than 50% of all planted stock from the cessation of maintenance till full site capture and subsequently maturity. Species should be prioritised for use based on their occurrence on the site. Other species are provided based on their potential to occur in the community and their likely availability for sale.

A range of alternative ground layer and grass species have the potential to occur in the community. These may be substituted based on additional observations (conducted during summer when flowering parts are present on grasses) and based commercial availability.

Table 19: Planting guide for 11.3.25 Restoration

Species	Mature stratum	Planting number per/100m2	Approximate target stocking rate / ha
Eucalyptus tereticornis	T1	2	75
Melaleuca fluviatilis	T1 / T2	4	175
Acacia excelsa	T2	4	200
Acacia leiocalyx	T2	4	200
Acacia salicina	T2	4	200
Alectryon diversifolius	T2/S	2	100
Cassia brewsteri	T2	4	200
Lysiphyllum carronii	T2	4	200
Notelaea microcarpa	T2/S	2	100
Terminalia oblongata	T2/S	4	200
Geijera salicifolia	T2/S	2	100
Carissa ovata	S	4	100
Grewia latifolia	S	4	100
Pittosporum angustifolium	S	4	100
Bothriochloa bladhii	GL	20	NA
Dianella caerulea	GL	10	NA
Dichanthium sericeum	GL	10	NA
Dichanthium setosum	GL	10	NA
Heterpogon contortus	GL	20	NA
Lomandra longifolia	GL	10	NA
Themeda triandra	GL	20	NA

Table 20: Planting guide for 11.5.3

Species	Mature stratum	Planting number per/100m2	Approximate target stocking rate / ha
Eucalyptus populnea	T1	2	75
Eucalyptus melanophloia	T1 / T2	4	175
Corymbia clarksoniana	T2	4	200
Eucalyptus cambageana	T2	4	200
Eucalyptus crebra	T2	2	100
Corymbia dallachiana	T2	4	200
Psydrax oleifolia	T2	2	100
Cassia brewsteri	T2	4	200
Lysiphyllum carronii	T2	4	200
Eremophila mitchellii	T2/S	4	200
Terminalia oblongata	T2/S	2	100
Geijera salicifolia	T2/S	2	100
Carissa ovata	S	2	50
Grewia latifolia	S	2	50
Erythroxylum australe	S	2	50
Capparis lasiantha	S	20	NA
Austrostipa ramosissima	GL	10	NA
Dichanthium sericeum	GL	10	NA
Heterpogon contortus	GL	20	NA
Lomandra patens	GL	10	NA
Themeda triandra	GL	20	NA

5.3.1 Rehabilitation Planting - Installation and Maintenance

The proposed rehabilitation area should be weed free at the commencement of planting. Proposed area should be de-compacted either through spot cultivation for individual plant specimens or through deep ripping and harrowing of the site.

Planting should utilise 125 mm native tube stock with established root systems and a minimum of 150 mm of growth out of the tube. Planting stock should not be J-rooted or pot bound. Plant spacing will be at intervals to achieve stocking rates as described in section 5.3 and Tables 19 and 20, the following planting technique is recommended:

- Decompact area around planting holes sufficiently to allow for water wells 600 mm in diameter around planted stock (to allow for pooling of water and to minimise run-off)
- Prepare planting hole within the decompacted area, slightly deeper and twice the width of the tube stock;
- Fertilise within planting hole two 10 g Agriform Fertiliser tablet or similar;
- Place plants and back fill
- Mulch area immediately surrounding plant to 700 mm diameter with weed free organic mulch, wood chip or similar;
- Water with a minimum of 10 L of water immediately after planting

The proposed rehabilitation planting will be supported by 12 weeks of establishment maintenance and 12 months of post establishment maintenance. Works will include replacement planting (as required), follow-up weed control and watering of planted stock.

All planted stock will be watered twice weekly for the first 4 weeks after planting (during the initial establishment phase) unless there is sufficient rainfall (>10 mm) to warrant cancellation.

Watering in the subsequent 8 weeks of establishment maintenance will be conducted weekly unless there is sufficient rainfall (>10 mm) to warrant cancellation. At the completion of establishment maintenance 100% of all planted stock will be present within the rehabilitation area. Replacement planting will be undertaken as required to maintain stocking rates.

Watering during post establishment maintenance will be as required to ensure minimum 80% survival rate of all planted stock within the rehabilitation area at completion of maintenance period. Replacement planting will be undertaken as required to maintain minimum final stocking rate.

Weed control will be conducted as required to maintain the rehabilitation area free from Class 2 or Class 3 weed species. A broad spectrum systemic glyphosate based herbicide is recommended for use at label rates. Weed control should be conducted fortnightly during establishment maintenance and monthly during the post establishment maintenance period. Site should be free from all class 2 or class 3 weed species at the completion of post establishment maintenance.

Other agricultural weeds and introduced pasture species should be controlled as needed to maintain the area in a tidy state. Specifically where these species are present and competing with planted stock they should be controlled with herbicide application, where grasses are abundant a graminoide specific herbicide should be considered for use at label rates to suppress grasses within 1 metre of planted stock, work to be conducted in conjunction with other weed control applications.

The site should be maintained in a tidy state via brush-cutting or mowing, brush-cutting should take place fortnightly during the establishment maintenance period and monthly during post establishment period.

The site should be protected from grazing by pest animals and other herbivores by temporary electric fencing which is fit for purpose in restricting, hares, deer, cattle and native herbivores.

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