

## **APPENDIX E: REGIONAL FLORA AND VEGETATION SURVEY (PHOENIX ENVIRONMENTAL SCIENCES)**





# PHOENIX

ENVIRONMENTAL SCIENCES

Regional flora and vegetation survey for St Ives Gold Mine

Prepared for St Ives Gold Mining Company Pty Ltd

November 2017

Final Report



Regional flora and vegetation assessment for the St Ives Gold Mine

Prepared for St Ives Gold Mining Company Pty Ltd

Final Report

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## EXECUTIVE SUMMARY

In September 2016, Phoenix Environmental Sciences Pty Ltd (Phoenix) was commissioned by Talis Consultants Pty Ltd on behalf of St Ives Gold Mining Company Pty Ltd (SIGM), which is part of the Gold Fields Australia (GFA) group of companies, the ultimate parent company of which is Gold Fields Limited, to undertake a Level 1 regional flora and vegetation assessment at SIGM's St Ives operations. The St Ives operations are located near Kambalda, approximately 50 km south of the City of Kalgoorlie-Boulder, where SIGM currently operates open pit and underground gold mining on and adjacent to Lake Lefroy.

The regional flora and vegetation assessment was undertaken to support expansion of the St Ives operations beyond 2018 (B2018 Project) and future exploration activities. It was conducted in November 2016, supplementary to a Level 2 flora and vegetation survey of the B2018 Project (B2018 study area) in September–November 2016. The regional study area covered approximately 60,223.8 ha.

A desktop review of relevant databases, previous survey reports and spatial data preceded the field survey to identify locations of previously recorded conservation significant flora and vegetation communities in the regional study area. The field survey involved sampling of 92 relevés and 3 quadrats within the regional study area. Targeted searches were conducted for conservation significant flora at the locations of previous records identified by the desktop review and in suitable habitat. Quadrat and relevé data were analysed and sites grouped by hierarchical cluster analyses (UPGMA). Vegetation types were then defined by clusters of quadrats, supplemented by field observations based on species composition, structure, and dominance at the stratum level.

Survey design, methodology and report-writing adhered to relevant principles and guidelines, including:

- EPA *Statement of Environmental Principles, Factors and Objectives*
- EPA *Environmental Factor Guideline: Flora and vegetation*
- EPA *Technical Guidance: Flora and vegetation surveys for Environmental Impact Assessment*.

Above average rainfall in August 2016 promoted flowering of perennial species in the regional study area leading up to the survey; however, much of the expected annuals were not present or were dead and at end of their lifecycle. Nine taxa could not be definitively identified at the species level typically due to insufficient taxonomic characters.

Limited access to parts of the regional study area constrained mapping of vegetation boundaries in the field in some instances, therefore some vegetation type boundaries were extrapolated using aerial imagery and previous vegetation mapping for parts of the study area.

The desktop review identified 42 conservation significant flora species potentially occurring within the regional study area. These species comprised of three Threatened species, including two listed under the *Environment Protection and Biodiversity Protection Act 1999* (one Endangered and one Vulnerable) and two listed as Vulnerable under the *Wildlife Conservation Act 1950*, 18 Priority 1 species, three Priority 2 species, 13 Priority 3 species and six Priority 4 species. Records of populations for 11 of the taxa occurred within the regional study area.

A total of 164 flora species and subspecies representing 33 families and 65 genera were recorded during the field survey. This included 155 perennial species and nine annual or short-lived species.

No Commonwealth or State listed Threatened Flora were recorded during the field survey; however, six Priority Flora were recorded in the regional study area:

- *Allocasuarina eriochlamys* subsp. *grossa* (Priority 3)
- *Calandrinia* sp. Widgiemooltha (F. Obbens & E. Reid FO 9/05) (Priority 1)
- *Cryptandra crispula* (Priority 3)
- *Cyathostemon divaricatus* (Priority 1)
- *Diocirea acutifolia* (Priority 3)
- *Pityrodia scabra* subsp. *dendrotricha* (Priority 3).

The field survey identified eight new records of four taxa within the regional study area; *Allocasuarina eriochlamys* subsp. *grossa*, *Calandrinia* sp. Widgiemooltha, *Cryptandra crispula* and *Diocirea acutifolia*. The remaining species were recorded as confirmations of previous records. A population of *Prostanthera splendens* (Priority 1) that occurred just outside of the regional study area was also confirmed during the current survey. In addition, four of the nine taxa that could not be definitively identified to species level may potentially represent Priority Flora.

A range extension of approximately 100 km north was recorded for one species, *Scaevola bursariifolia*. Its occurrence in the regional study area may be considered locally significant as it represents the northern limit of the known distribution.

A total of 34 vegetation types were defined for the regional study area comprising 24 woodland communities and 10 shrublands. A mosaic of the three vegetation types S2, S3 and C3 was mapped where it was difficult to identify boundaries from aerial imagery. The woodland vegetation types were the most dominant representing 87.04% of the vegetation in the regional study area.

The vegetation was predominantly in Pristine to Excellent condition. The number and extent of weed species was low (only four species) reflecting a low level of disturbance. No declared pests or Weeds of National Significance were recorded.

None of the vegetation types in the regional study area were considered representative of a Commonwealth or State-listed Threatened Ecological Community (TEC) or State-listed Priority Ecological Community (PEC).

The majority of the vegetation types defined for the regional study area are representative of the broad vegetation associations mapped by Shepherd *et al.* (2002). Each of the vegetation types mapped are classed as Least Concern based on representative vegetation association, as in excess 90% of pre-European extent remains. Consequently, the majority of the vegetation in the regional study area represents widespread communities that are well represented at a regional level.

About two thirds of the vegetation types defined may be considered locally significant as they represent habitat for Priority Flora and/or have a restricted local distribution either within the regional study area and/or the combined B2018 and regional study areas.

For the B2018 study area, locally significant vegetation was predominantly defined by the vegetation communities associated with the riparian zone of Lake Lefroy. The regional survey indicated that vegetation associated with the riparian areas of Lake Lefroy may also be regionally restricted. However, the regional study area did not encompass a large section of this riparian zone and aerial imagery indicates that much of the unmapped shoreline of the lake may be comprised of these restricted vegetation types. It is recommended that future regional surveys include further sampling of the riparian communities around Lake Lefroy to better define the distribution of riparian vegetation communities and associated conservation significant flora.

# 1 INTRODUCTION

In September 2016, Phoenix Environmental Sciences Pty Ltd (Phoenix) was commissioned by Talis Consultants Pty Ltd on behalf of St Ives Gold Mining Company Pty Ltd (SIGM), which is part of the Gold Fields Australia (GFA) group of companies, the ultimate parent company of which is Gold Fields Limited, to undertake a regional flora and vegetation assessment at SIGM's St Ives operations.

SIGM's St Ives operations are located near Kambalda, approximately 50 km south of the City of Kalgoorlie-Boulder and stretching across central parts of Lake Lefroy (Figure 1-1).

## 1.1 BACKGROUND

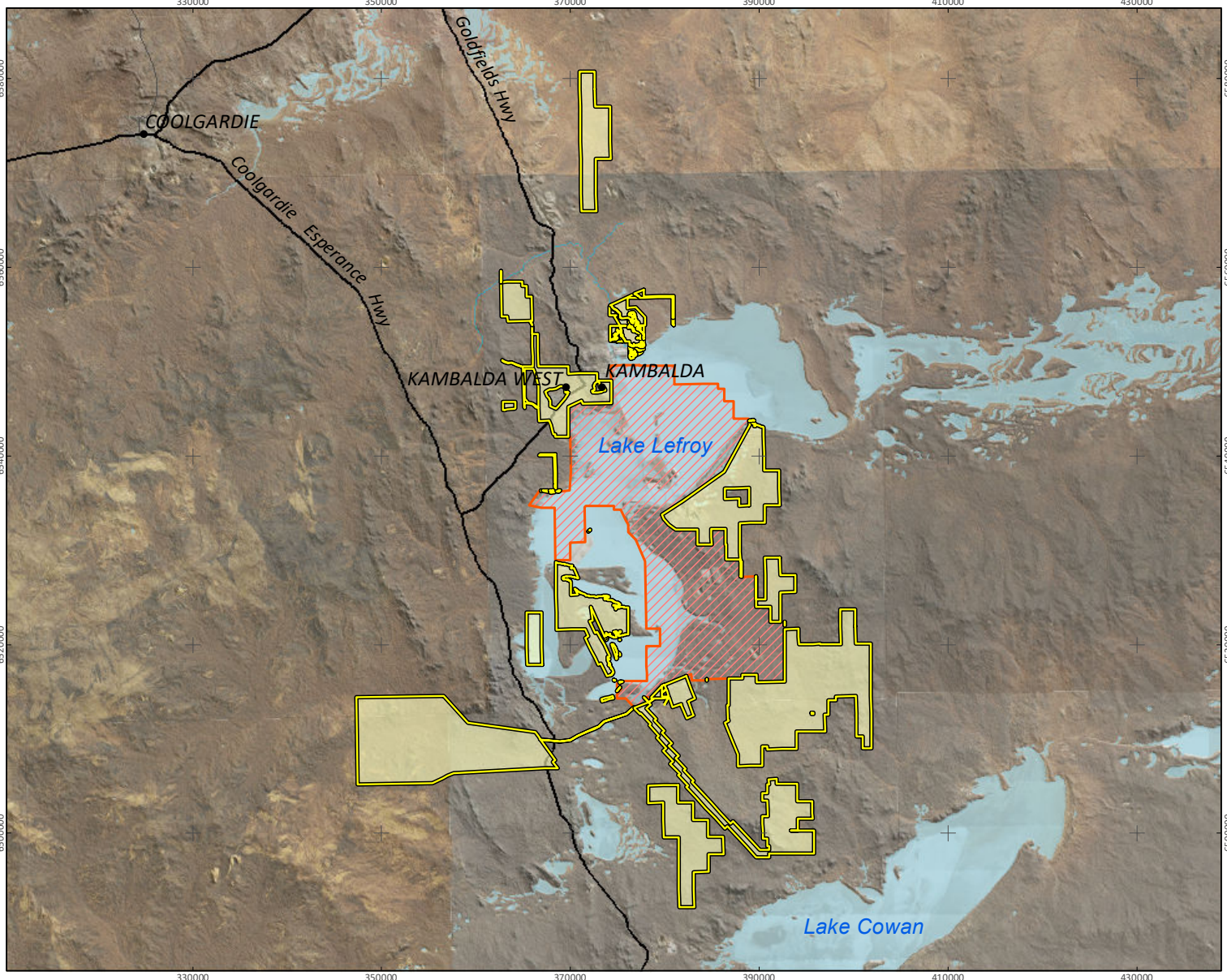
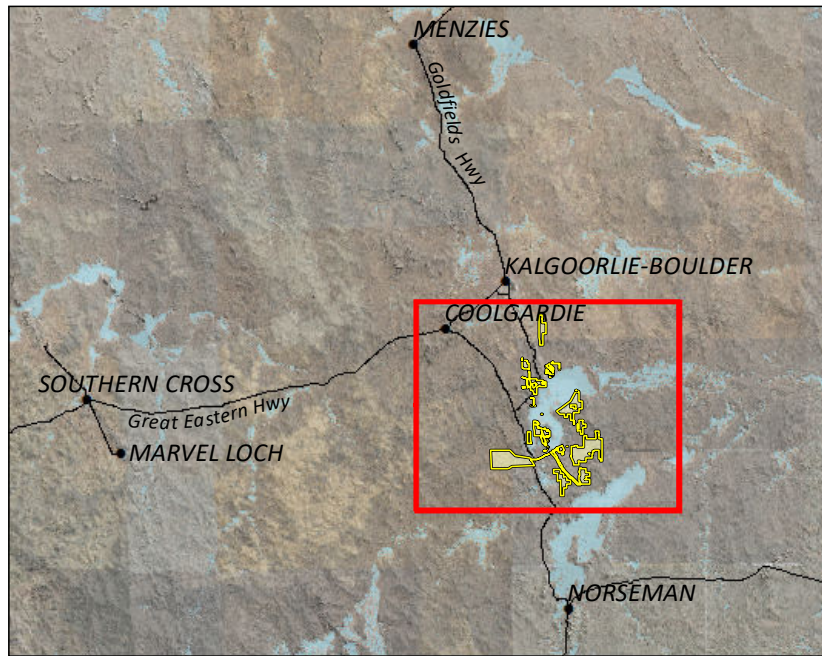
SIGM's St Ives operations at Lake Lefroy are currently approved under Ministerial Statement (MS) 879. Operations at St Ives Gold Mine entail mining beneath the surface of the lake, land-based operations and dewatering discharge to the lake. The lake is a hypersaline ephemeral playa covering approximately 55,400 ha. The Office of Environmental Protection Authority (EPA) recently approved SIGM's application to allow continuation of operations beyond 2016 (the B2016 project) under the Section 45 of the *Environmental Protection Act 1986* (EP Act). It is expected that the B2016 proposal will provide sufficient mining capacity to the end of 2018.

To ensure the St Ives operations will continue beyond 2018, the St Ives Gold Mine Beyond 2018 Project ('B2018 Project') has been initiated. Operational continuity will require mining activity to extend beyond the MS 879 approved footprint, covering a broad area encompassing terrestrial and lake-based operations (the B2018 study area; Figure 1-1).

Biological surveys of the B2018 study area were undertaken in 2016 to support environmental approvals for the B2018 Project (Phoenix 2016, 2017a, b). In addition, Gold Fields required a less detailed regional reconnaissance flora and vegetation survey over the majority of Gold Fields tenure (regional study area), excluding the B2018 study area, to provide additional information for the B2018 Project approvals, as well as for future exploration activities. The regional study area covers approximately 60,223.8 ha (Figure 1-1).

Regional surveys have previously been undertaken at St Ives approximately every five-years to allow continuation of exploration activities (Botanica Consulting 2012d; Jim's Weeds 2006; Mattiske 1996; Paul Armstrong and Associates 2016). These regional surveys have typically entailed low intensity sampling and broad-scale vegetation descriptions and mapping.





#### St Ives Gold Mine

Project No 1128  
Date 08-Feb-17  
Drawn by KW  
Map author KC



0 2.5 5 10 15 20 25  
Kilometres

1:650,000 (at A4) GDA 1994 MGA Zone 51

- B2018 study area
- Regional study area

All information within this map is current as of 08-Feb-17. This product is subject to COPYRIGHT and is property of Phoenix Environmental Sciences (Phoenix). While Phoenix has taken care to ensure the accuracy of this product, Phoenix make no representations or warranties about its accuracy, completeness or suitability for any particular purpose.

#### Figure 1-1

**Location of the St Ives Gold Mine Beyond 2018 Project and regional study area**



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## 1.2 SURVEY OBJECTIVE AND SCOPE OF WORKS

This report details the flora and vegetation assessment undertaken within the regional study area.

The objective of the regional flora and vegetation assessment was to broadly define the botanical values of the regional study area and, where possible, extend the distribution of conservation significant values (species and communities) identified within the B2018 study area. A reconnaissance survey is conducted to provide context and gather broad information about a survey area (EPA 2016c). It comprises a desktop study to gather contextual information of the area, including identifying features and habitat of conservation significant flora and vegetation, and database searches for recorded locations of conservation significant flora and vegetation. The desktop study is followed by a reconnaissance survey to verify the information obtained from the desktop study, characterise the flora, clarify whether the area may support conservation significant flora or communities and delineate the vegetation units present.

The scope of works undertaken to achieve this objective was as follows:

- desktop review of available technical reports and relevant databases to determine the potential for conservation significant flora and vegetation within the regional study area
- single season reconnaissance field survey to identify flora species and assemblages present within the regional study area, including:
  - targeted searches for and description of populations of conservation significant species, particularly those identified in or in close proximity to the regional study area from the desktop review
  - targeted searches for and description of populations of introduced plant species, particularly declared pests and weeds of national significance
  - define and map vegetation types present, consistent with vegetation mapping in the B2018 study area (Phoenix 2017a)
  - review of local and regional significance of the vegetation types recorded
  - record of condition of vegetation
- data analyses, sample processing and species identifications for samples collected during the field survey
- preparation of maps showing significant species records and vegetation communities
- preparation of a comprehensive flora and vegetation technical report and supporting raw and digital data incorporating results of the desktop review and field survey
- define additional populations of any conservation significant flora recorded within the B2018 study area (Phoenix 2017a) and further delineate suitable habitat extent for these species within the regional study area
- determine additional representation of any locally or regionally significant (e.g. rare or restricted) vegetation communities recorded within the B2018 study area (Phoenix 2017a)
- if potential for presence of any Threatened Ecological Community (TEC) or Priority Ecological Community (PEC) is identified in the B2018 study area (Phoenix 2017a), conduct further assessment of extent of the community within the regional study area.



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Where applicable survey design, methodology and technical reporting adhered to relevant principles and guidelines, including:

- EPA *Statement of Environmental Principles, Factors and Objectives* EPA (2016b)
- EPA *Environmental Factor Guideline: Flora and vegetation* (EPA 2016c)
- EPA *Technical Guidance: Flora and vegetation surveys for Environmental Impact Assessment* (EPA 2016a).

## 2 LEGISLATIVE CONTEXT

The protection of flora and fauna in Western Australia (WA) is principally governed by three acts:

- Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- *Wildlife Conservation Act 1950* (WC Act)
- *Environmental Protection Act 1986* (EP Act).

### 2.1 COMMONWEALTH

Under the EPBC Act, actions that have, or are likely to have, a significant impact on a matter of national environmental significance (NES), require approval from the Australian Government Minister for the Environment. The EPBC Act provides for the listing of Threatened native flora and Threatened Ecological Communities (TECs) as matters of NES.

Conservation categories applicable to Threatened Flora species under the EPBC Act are as follows:

- Extinct (EX)<sup>1</sup> – there is no reasonable doubt that the last individual has died
- Extinct in the Wild (EW) – taxa known to survive only in captivity
- Critically Endangered (CR) – taxa facing an extremely high risk of extinction in the wild in the immediate future
- Endangered (EN) – taxa facing a very high risk of extinction in the wild in the near future
- Vulnerable (VU) – taxa facing a high risk of extinction in the wild in the medium-term
- Conservation Dependent<sup>1</sup> – taxa whose survival depends upon ongoing conservation measures; without these measures, a conservation dependent taxon would be classified as Vulnerable or more severely Threatened.

Ecological communities are defined as ‘naturally occurring biological assemblages that occur in a particular type of habitat’ (English & Blyth 1997). There are three categories under which ecological communities can be listed as TECs under the EPBC Act: Critically Endangered, Endangered and Vulnerable.

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<sup>1</sup> Species listed as Extinct and Conservation Dependent are not matters of NES and therefore do not trigger the EPBC Act.

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## 2.2 STATE

### 2.2.1 Threatened and Priority species

In WA, the WC Act provides for the listing of protected flora (Threatened Flora) species that are under identifiable threat of extinction. Protected flora listed under the WC Act receive statutory protection and, under current classifications (Western Australian Government 2015), are assigned to one of four categories (schedules):

- Schedule 1 – flora that are considered likely to become extinct or rare as Critically Endangered (CR) flora
- Schedule 2 – flora that are considered likely to become extinct or rare as Endangered (EN) flora
- Schedule 3 – flora that are considered likely to become extinct or rare as Vulnerable (VU) flora
- Schedule 4 – flora presumed to be extinct (EX).

All listed species are in need of special protection and are declared to be Rare Flora for the purposes of section 23F of the WC Act (Western Australian Government 2015). Assessments for listing of flora are based on the International Union for Conservation of Nature (IUCN) threat categories. Any activities deemed to have a significant impact on listed flora species may trigger referral to the EPA for assessment under the EP Act.

The Department of Parks and Wildlife (DPaW) administers the WC Act and maintains a non-statutory list of Priority Flora species (updated annually). Priority species are still considered to be of conservation significance; that is, they may be rare or threatened, but cannot be considered for listing under the WC Act until there is adequate understanding of their threat levels. Species on the Priority Flora lists are ranked in order of requiring survey and evaluation for consideration of their conservation status as Threatened flora, with P1 being of highest priority and P4 of lowest priority (Appendix 1).

### 2.2.2 Threatened and Priority Ecological Communities

The Minister for Environment may list ecological communities, which are at risk of becoming destroyed as 'Threatened'. DPaW maintains a list of ministerial-endorsed TECs which fall into three categories (Appendix 1):

- Critically endangered (CR)
- Endangered (EN)
- Vulnerable (VU).

There is an additional category, Presumed Totally Destroyed, where all records of the ecological community within the last 50 years have been destroyed or presumed to be destroyed.

DPaW also maintains a non-statutory list of Priority Ecological Communities (PECs), which may become Threatened Ecological Communities in the future, however currently that do not meet survey criteria or that are not adequately defined. PECs are assigned to one of five categories depending on their priority for survey or definition, with Priority 1 of highest concern and Priority 5 of lowest concern (Appendix 1).

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### 2.2.3 Locally or regionally significant flora and vegetation

Flora species, subspecies, varieties, hybrids and ecotypes may be significant for a variety of other reasons than being listed as Threatened or Priority Flora, including where they have keystone roles for Threatened species, are representative of the range limit of a species, are locally endemic, are poorly preserved or display anomalous features that indicate a potential new discovery (EPA 2016a).

Native vegetation communities may be considered significant for a range of reasons other than listing as a TEC or PEC, including where they have restricted distributions (i.e. to one or two locations or as isolated communities, or are below threshold levels), exhibit unusually high structural and species diversity, are limited to specific landform types, are determined to be uncommon or restricted within the regional or local context, have a role as key habitat for Threatened or Priority species or provide refugial habitats (EPA 2004). It may be considered that representation of less than one percent of the total study area or vegetation in Excellent or better condition defines locally (i.e. at the scale of the survey) significant vegetation (Shepherd *et al.* 2002).

A vegetation community is considered regionally significant if it is classified as under-represented, that is, there is less than 30% of its original distribution remaining. Several key criteria are applied to vegetation clearing, as follows (EPA 2000)<sup>2</sup>:

- the 'threshold level' below which species loss appears to accelerate exponentially within an ecosystem level is regarded as being at a level of 30% (of the pre-European, i.e. pre-1750 extent of the vegetation type)
- a level of 10% of the original extent is regarded as being a level representing Endangered
- clearing which would result in an increase in the threat level such that it changes the assigned remaining status classification (see below) should be avoided.

Shepherd *et al.* (2002) have assigned the status of vegetation remaining (compared to pre-European extent) into five classes:

- Presumed Extinct – probably no longer present in the bioregion
- Endangered<sup>3</sup> – <10% of pre-European extent remains
- Vulnerable<sup>3</sup> – 10–30% of pre-European extent exists
- Depleted<sup>3</sup> – >30% and up to 50% of pre-European extent exists
- Least Concern – >50% pre-European extent exists and subject to little or no degradation over a majority of this area.

### 2.2.4 Clearing of native vegetation

The clearing of native vegetation in WA is not generally permitted where the biodiversity values, land conservation and water protection roles of native vegetation would be significantly affected. Any clearing of native vegetation in WA requires a permit under Part V Division 2 of the EP Act, except where an exemption applies under the act, or is prescribed by the *Environmental Protection*

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<sup>2</sup> A new guideline on vegetation clearing has not been published by the EPA as part of their reform process that commenced in 2016.

<sup>3</sup> or a combination of depletion, loss of quality, current threats and rarity gives a comparable status.

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(*Clearing of Native Vegetation*) Regulations 2004 (the Regulations), and the vegetation is not in an Environmentally Sensitive Area (Government of Western Australia 2013c).

## 2.2.5 Environmentally Sensitive Areas

Under section 51B of the EP Act the Minister for Environment may declare by notice either a specified area of the State or a class of areas of the State to be Environmentally Sensitive Areas (ESAs). ESAs are declared in the *Environmental Protection (Environmentally Sensitive Areas) Notice 2005*, which was gazetted on 8 April 2005 (DMP 2008).

ESAs are areas where the vegetation has high conservation value. Several types of areas are declared ESAs including:

- the area covered by vegetation within 50 m of Threatened Flora, to the extent to which the vegetation is continuous with the vegetation in which the Threatened Flora is located
- the area covered by a TEC
- a defined wetland (Ramsar wetlands, conservation category wetlands and nationally important wetlands) and the area within 50 m of the wetland
- Bush Forever sites.

## 2.3 INTRODUCED FLORA

Introduced flora pose threats to biodiversity and natural values by successfully out-competing native species for available nutrients, water, space and sunlight; reducing the natural structural and biological diversity by smothering native plants or preventing them from growing back after clearing, fire or other disturbance; replacing the native plants that animals use for shelter, food and nesting; and altering fire regimes, often making fires hotter and more destructive (AWC 2007).

Management of some weed species is required under Commonwealth or State frameworks. Key classifications for significant introduced flora that are relevant to this report are:

- Declared Pest – the *Biosecurity and Agriculture Management Act 2007* (BAM Act), Section 22 makes provision for a plant taxon to be listed as a declared pest organism in parts of, or the entire State. Under the *Biosecurity and Agriculture Management Regulations 2013*, declared pests are assigned to one of three control categories that dictate level of management required (Table 2-1).
- Weed of National Significance (WoNS) – high impact, established introduced flora causing major economic, environmental, social and/or cultural impacts in a number of states/territories, and which have strong potential for further spread (Australian Weeds Committee 2012) Management is required in accordance with Department of Agriculture and Food guidelines for particular WoNS.

Throughout the report, introduced flora species are indicated with an asterisk (\*).

**Table 2-1 Description of control categories for declared pests (Government of Western Australia 2013b)**

Control Category	Description
C1 Exclusion	If in the opinion of the Minister introduction of the declared pest into an area or part of an area for which it is declared should be prevented.
C2 Eradication	If in the opinion of the Minister eradication of the declared pest from an area or part of an area for which it is declared is feasible.
C3 Management	If in the opinion of the Minister eradication of the declared pest from an area or part of an area for which it is declared is not feasible but that it is necessary to — <ul style="list-style-type: none"> <li>(i) alleviate the harmful impact of the declared pest in the area; or</li> <li>(ii) reduce the number or distribution of the declared pest in the area; or</li> <li>(iii) prevent or contain the spread of the declared pest in the area.</li> </ul>

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## 3 EXISTING ENVIRONMENT

### 3.1 INTERIM BIOGEOGRAPHIC REGIONALISATION OF AUSTRALIA (IBRA)

The Interim Biogeographic Regionalisation of Australia (IBRA) defines 'bioregions' as large land areas characterised by broad, landscape-scale natural features and environmental processes that influence the functions of entire ecosystems (Department of the Environment and Energy 2016; Thackway & Cresswell 1995). They categorise the large-scale geophysical patterns that occur across the Australian continent that are linked to fauna and flora assemblages and processes at the ecosystem scale. They are a useful means for simplifying and reporting on more complex patterns of biodiversity (Thackway & Cresswell 1995).

Western Australia contains 26 IBRA bioregions and 53 subregions. The regional study area falls within the Coolgardie bioregion which covers an area of 129,117 km<sup>2</sup> and is divided into three subregions; Mardabilla (COO1), Southern Cross (COO2) and Eastern Goldfields (COO3) (Thackway & Cresswell 1995).

The majority of the regional study area (92%) is situated in the Eastern Goldfields subregion (Figure 3-1) which is characterised by Cowan (2001) as:

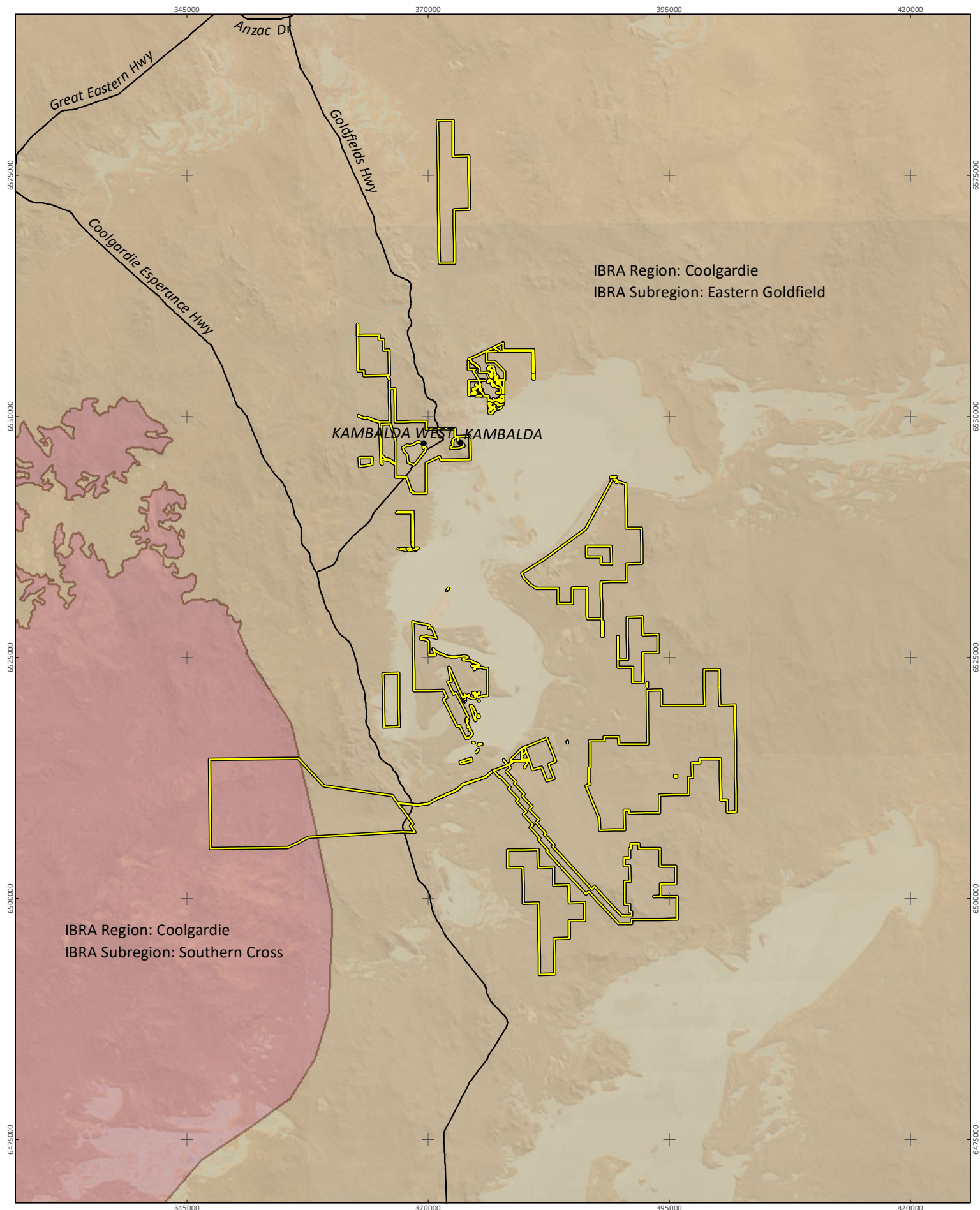
- gently undulating plains interrupted in the west with low hills and ridges of Archaean greenstones and in the east by a horst of Proterozoic basic granulite
- tertiary soils dominated by calcareous earths overlay eroded gneisses and granites
- a series of large playa lakes, including Lake Lefroy, indicate the remnants of an ancient major drainage line in the western half
- vegetation consisting of mallees, *Acacia* thickets and shrub-heaths on sandplains
- dwarf shrublands of samphires persist on salt lakes, surrounded by diverse *Eucalyptus* woodlands, which also occur on ranges and in valleys.

The Eastern Goldfields subregion is regarded for its high floristic abundance and ecosystem diversity, in particular, *Eucalyptus* spp., *Acacia* spp. and ephemeral flora communities (Cowan 2001).

One small section (2%) of the regional study area is located in the Southern Cross subregion (Figure 3-1) characterised as (Cowan *et al.* 2001):

- subdued relief, comprising gently undulating uplands dissected by broad valleys with bands of low greenstone hills
- valleys with Quaternary duplex and gradational soils containing chains of saline playa-lakes
- diverse woodlands rich in endemic *Eucalyptus* spp. on low greenstone hills, valley alluvials and broad plains that surround the salt lakes
- dwarf shrublands of samphires on the salt lake playa
- mallee woodlands and scrub heath rich in endemic *Acacia*'s and Myrtaceae shrubs on the yellow sandplains, gravelly sandplains and laterite breakaways.

The Southern Cross subregion is noted for its high species and ecosystem diversity particularly on banded ironstone ranges and the ephemeral flora communities of the Tertiary sandplain scrubs and valley floor woodlands (Cowan *et al.* 2001).



St Ives Gold Mine	
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Drawn by	KW
Map author	KC
1:500,000 (at A4) GDA 1994 MGA Zone 51	

- Regional study area
- IBRA subregions
  - Eastern Goldfield
  - Southern Cross

**Figure 3-1**

**Location of the regional study area in relation to IBRA bioregions and subregions**

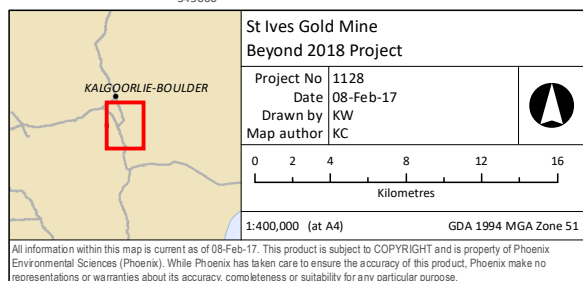
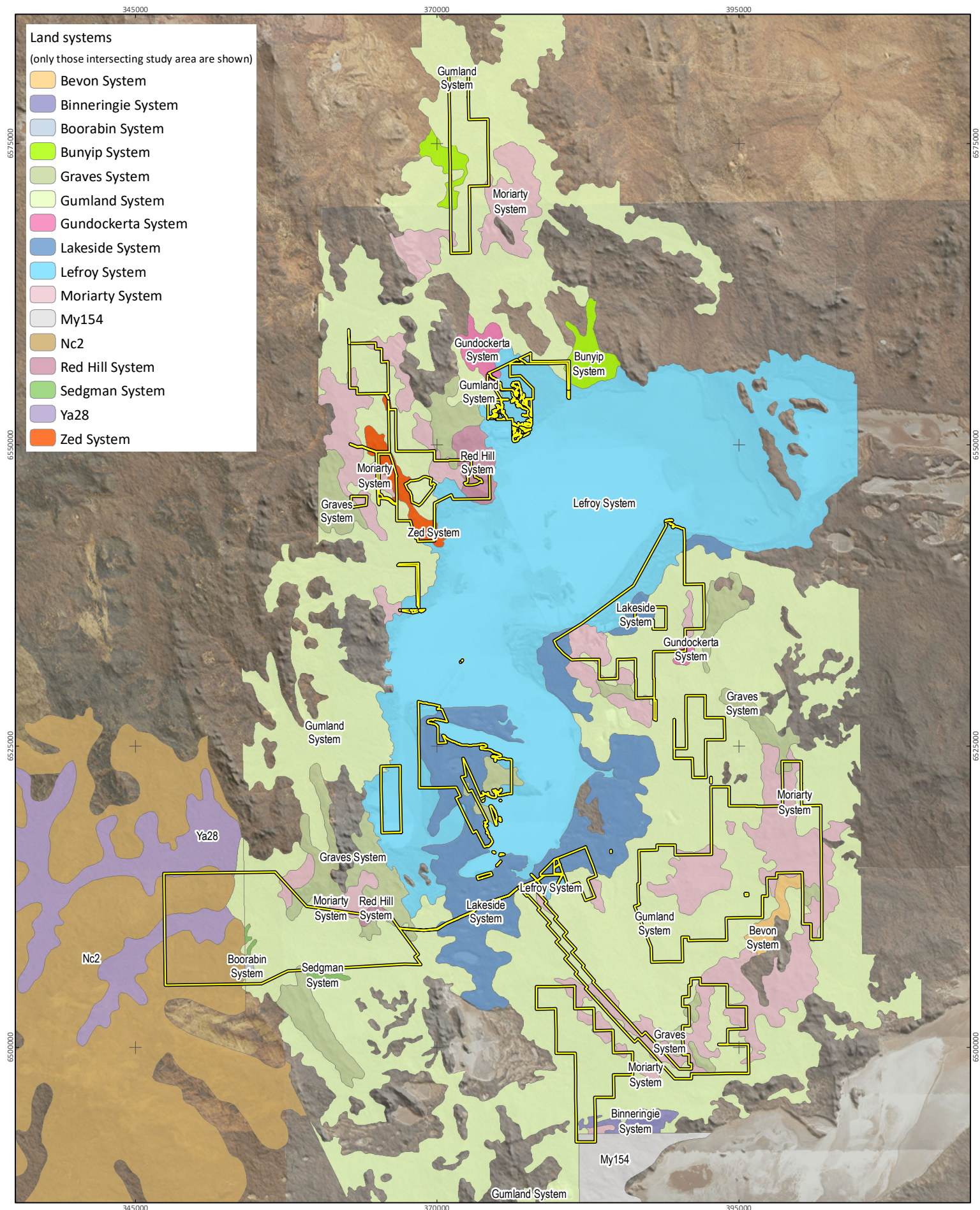
### 3.2 LAND SYSTEMS

The Department of Agriculture and Food Western Australia (DAFWA) has partially mapped the land systems of the Eastern Goldfields and Southern Cross subregions from aerial photography. Land systems are grouped according to landform, soils, vegetation and drainage patterns (Payne *et al.* 1998). The regional study area intersects 16 land systems (Figure 3-2) but is dominated by the Gumland system that covers 53% of the study area (Figure 3-2; Table 3-1).

**Table 3-1 Extent of each land system present in the regional study area**

Land system	Description	Total area (ha)	Percentage (%)
Bevon (BEV)	Irregular low ironstone hills with stony lower slopes supporting mulga shrublands.	12.6	0.02
Binneringie (BNE)	Hills and plains supporting dense tall acacia shrubland with scattered Eucalypt trees.	94.8	0.16
Boorabin (BOR)	Yellow sandplains with mixed shrublands and spinifex	83.1	0.14
Bunyip (BUY)	Gilgaied drainage tracts supporting mixed halophytic shrublands occasionally with a black oak overstorey, draining greenstone hills.	429.8	0.71
Graves (GRV)	Basalt and greenstone rises and low hills supporting eucalypt woodlands with prominent saltbush and bluebush understoreys	1818.4	3.02
Gumland (GML)	Extensive pedeplains supporting eucalypt woodlands with halophytic and non-halophytic shrub understoreys	32037.6	53.20
Gundockerta (GUN)	Extensive, gently undulating calcareous stony plains supporting bluebush shrublands.	153.8	0.26
Lakeside (LAS)	Sandplains with occasional sand dunes and prominent claypans, supporting mallee eucalypts and spinifex	3709.3	6.16
Lefroy (LEF)	Salt lakes and fringing saline plains, sandy plains and dunes with chenopod low shrublands	4877.8	8.10
Moriarty (MOR)	Low greenstone rises and stony plains supporting chenopod shrublands with patchy eucalypt overstoreys	9760.9	16.21
My154	Undescribed land system	101.1	0.17
Nc2	Undescribed land system	4477.52	7.43
Red Hill (RHL)	Basalt hills and ridges supporting acacia shrublands and patchy eucalypt woodlands with mainly non-halophytic undershrubs	609.1	1.01
Sedgman (SDG)	Gritty surfaced plains with granite outcrop and low granite domes and hills supporting acacia shrublands.	124.6	0.21
Ya28	Undescribed land system	1209.2	2.01
Zed (ZED)	Low hills, rises and gently undulating stony plains based on metasedimentary rocks supporting acacia shrublands	724.4	1.20
<b>Total:</b>		<b>60224.0</b>	<b>100</b>





Regional study area

**Figure 3-2**

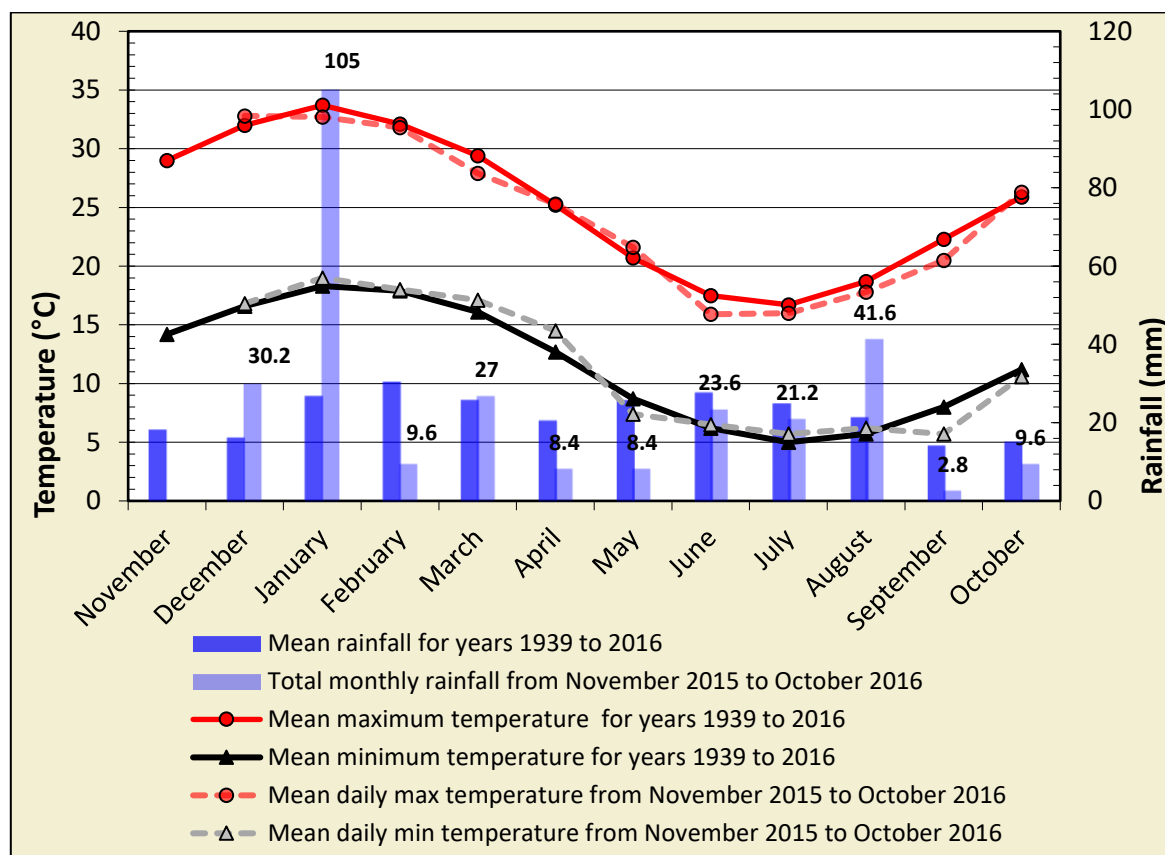
**Land systems of the  
regional study area**

### 3.3 CLIMATE AND WEATHER

The climate of the Coolgardie bioregion is semi-arid (Department of the Environment 2008). The nearest Bureau of Meteorology (BoM) weather station with comprehensive data collection and historic climate data is located at City of Kalgoorlie-Boulder Airport (Latitude: 30.78°S Longitude: 121.45 °E) approximately 80 km north of the regional study area. City of Kalgoorlie-Boulder Airport records the highest maximum mean monthly temperature (33.7°C) in January and the lowest maximum mean annual temperature (16.7°C) in July. Average annual rainfall is 266.3 mm with January, February and June recording the highest monthly averages (26.8, 30.4 and 27.7 mm respectively). Tropical rain-bearing depressions moving southwards from northern Australian waters can cause heavy rainfall events in summer (BoM 2016) (Figure 3-3).

Mean monthly temperatures recorded in the 12 months preceding the field survey were comparable to the annual means with the exception of September 2016, when minimum and maximum temperatures were well below average (Figure 3-3).

Total monthly rainfall for the 12 months preceding the survey was below the long-term monthly average in most months; however, summer rainfall (December 2015 and January 2016) was considerably higher than average as a result of cyclonic activity in northern Western Australia. Above average rainfall was also recorded in August 2016, which subsequently promoted the early establishment of spring annual flora species.



**Figure 3-3** Annual climate data (average monthly temperatures and rainfall records) and records for the year preceding the field survey for City of Kalgoorlie-Boulder Airport (no. 12038) (BoM 2016)



### 3.4 LAND USE

The dominant land uses within both the Eastern Goldfields and Southern Cross subregions are Unallocated Crown Land (UCL) or Crown reserve and grazing-native pasture-leasehold and to a lesser extent conservation reserves, mining tenements and dryland agriculture (Cowan 2001; Cowan *et al.* 2001). Mining and mineral exploration tenure covers the entire regional study area; however, these activities are currently confined to the northern portion and to the east of Lake Lefroy.

### 3.5 NATIVE VEGETATION EXTENT AND STATUS

Shepherd *et al.* (2002) broadly mapped vegetation associations in Western Australia. The regional study area includes 12 vegetation associations all occurring within the Binneringie system (Table 3-2; Figure 3-4). The most common vegetation association within the regional study area was 936 with 26098 ha present and described as Medium woodland; salmon gum (Government of Western Australia 2015).

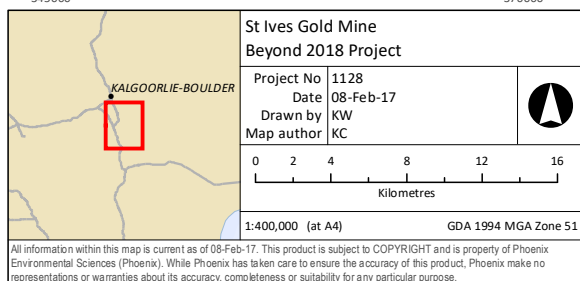
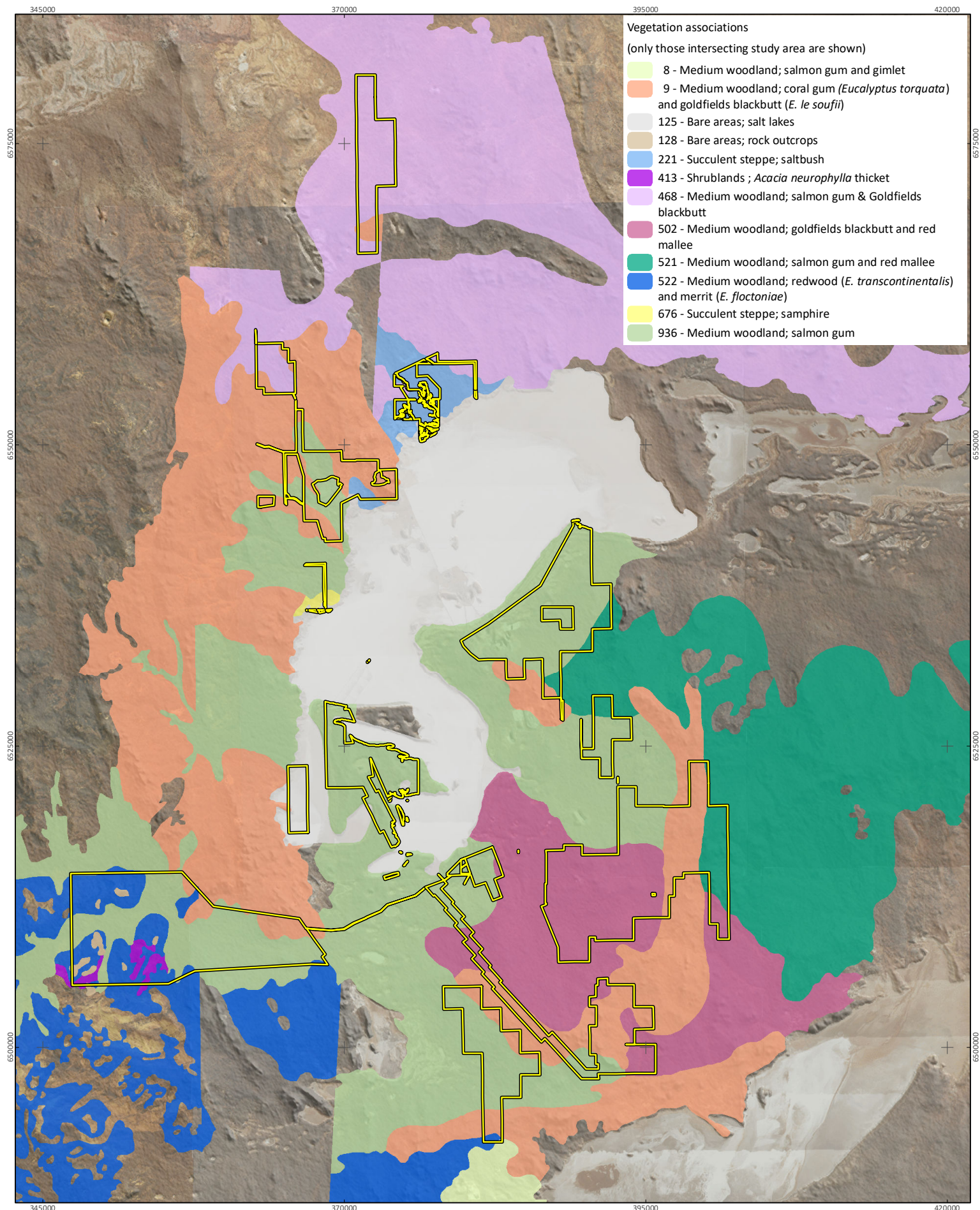
Of 12 of the vegetation associations that occur in the regional study area based on the mapping of Shepherd *et al.* (2002), 11 have in excess of 50% of pre-European extent remaining and therefore the status of Least Concern (Table 3-2). One vegetation association (11) has just below 50% remaining and the status of Depleted.

**Table 3-2 Extent and conservation status of the Shepherd *et al.* (2002) vegetation associations intersecting the regional study area (Government of Western Australia 2015)**

System	Vegetation association	Pre-European extent (ha)	Current extent (ha)	% remaining	Status	Amount of association within regional study area (ha)
Binneringie	11	694,638.13	346,569.75	49.89	Depleted	26098
Binneringie	10324	240,509.33	235,161.94	97.78	Least concern	10324
Binneringie	1267	3,485,786.61	3,146,496.09	90.27	Least concern	9220
Binneringie	446	329,836.19	288,743.04	87.54	Least concern	4301
Binneringie	1406	63,720.06	59,923.05	94.04	Least concern	3996
Binneringie	711	3,474.36	1,771.82	51.00	Least concern	2429
Binneringie	3996	592,022.37	583,902.78	98.63	Least concern	1406
Binneringie	9220	46,196.11	46,004.20	99.58	Least concern	1267
Binneringie	2429	122,059.53	122,059.53	100.00	Least concern	711
Binneringie	4301	709,715.02	709,228.27	99.93	Least concern	446
Binneringie	17	2,063,413.94	1,963,861.58	95.18	Least concern	17
Binneringie	26098	698,752.03	676,690.81	96.84	Least concern	11
<b>Total</b>						<b>60224</b>

### **3.6 CONSERVATION RESERVES AND ENVIRONMENTALLY SENSITIVE AREAS**

No conservation reserves or environmentally sensitive areas (ESAs) are present within the B2018 regional study area. The north-west part of the study area is adjacent to the Kambalda Nature Reserve. Dordie Rock Nature Reserve and Binaronca Nature Reserve are situated within 5 km of the southern part of the study area (Figure 1-1).



Regional study area

### Figure 3-4

**Shepherd *et al.* (2002)  
vegetation associations of  
the regional study area**

## 4 METHODS

### 4.1 DESKTOP REVIEW

Database searches and literature reviews of relevant publications were undertaken to compile a list of flora and vegetation types recorded within and in the vicinity of the regional study area, and identify conservation significant species and ecological communities that may occur there.

The following flora database searches were undertaken encompassing the regional study area:

- EPBC Act Protected Matters Search Tool (Department of the Environment 2016)
- DPaW Threatened Flora and Ecological communities database for an area bound by the coordinates: NE 30.85°S, 122.01°E; SW 31.72°S, 121.36°E (DPaW 2016c)
- DPaW NatureMap database for an area within a 40 km buffer of the centre coordinates 31.14° S, 121.69°E (DPaW 2016b)
- Shared Land Information Platform for Environmentally Sensitive Areas (ESAs) (Landgate 2016).

A literature review was conducted for biological assessments undertaken within and in the vicinity of the regional study area to supplement the potential species lists collated from the database searches. Several flora and vegetation surveys have already been conducted within the regional study area (Table 4-1).

**Table 4-1 Flora and vegetation survey reports incorporated in the desktop review**

Report author	Survey type	Project
Mattiske (1996)	Flora and vegetation studies	Kambalda Nickel Operations Western Mining Corporation
Mattiske (2001)	Flora and vegetation survey	Pistol Club Area
Datson (2004)	Vegetation monitoring 2004	Lake Lefroy Shoreline
Jim's Weeds (2005)	Flora and vegetation survey	Heap Leach Facility Expansion
Jim's Weeds (2006)	Regional vegetation survey	Mining Tenements of St Ives Gold Mine
Botanica Consulting (2007)	Flora and vegetation survey	Leviathan Haul Road
Botanica Consulting (2009a)	Flora and vegetation survey	Tailings Storage Facility
Botanica Consulting (2009b)	Flora survey	St Ives Gold Mine AAA Project
Botanica Consulting (2009c)	Vegetation monitoring	Monitoring of Riparian Vegetation Fringing Lake Lefroy
van Etten (2009a)	Flora and vegetation survey	Pistol Club Pit
van Etten (2009b)	Flora and vegetation survey	Exploration area south of Kambalda
Botanica Consulting (2010a)	Flora survey	Diana, West Idough and Bellerophon Projects



Report author	Survey type	Project
Botanica Consulting (2010b)	Interim status report	Lake Based Rehabilitation
Botanica Consulting (2010c)	Level 2 flora survey	Diana, West Idough and Bellerophon Projects
Botanica Consulting (2010d)	Vegetation monitoring	Riparian vegetation fringing Lake Lefroy
Botanica Consulting (2011a)	Level 1 flora and vegetation survey	Proposed Workshop area
Botanica Consulting (2011b)	Level 1 flora and vegetation survey	Thunderer Project
Botanica Consulting (2011c)	Level 1 flora survey	Proposed 66kv Powerline Extension Athena area
Botanica Consulting (2012a)	Level 1 flora and vegetation survey	Idough
Botanica Consulting (2012b)	Level 1 flora and vegetation survey	Neptune
Botanica Consulting (2012c)	Level 1 flora and vegetation survey	Northern Exploration Areas
Botanica Consulting (2012d)	Level 1 flora and vegetation survey	Regional survey
Botanica Consulting (2013a)	Level 1 flora and vegetation survey	Invincible Road
Botanica Consulting (2013b)	Level 1 flora and vegetation survey and Priority search	Red Hill Leases
Botanica Consulting (2013c)	Level 1 flora and vegetation survey	Southern Leases
Terratree (2015)	Level 1 flora, fauna and vegetation assessment	St Ives Gold Mine
Karillön (2016)	Notes on the flora of portions	Delta Island South
Terratree (2016)	Desktop assessment of environmental constraints and opportunities	Delta Island South and Incredible Project Areas
Phoenix (2017a)	Level 2 flora and vegetation survey	B2018 study area
Paul Armstrong and Associates (2016)	Level 1 flora and vegetation survey	Kambalda West regional survey

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## 4.2 FIELD SURVEY

A spring flora and vegetation survey was undertaken in the regional study area over nine days from 7 November – 15 November 2016, and included:

- surveying of relevés and supplementary quadrats (see 4.2.1 and Figure 4-1)
- targeted flora searches (see 4.2.3)
- vegetation mapping (see 4.2.4)
- condition mapping (see 4.2.5).

Prior to the commencement of the field surveys, data including satellite imagery and previous vegetation maps were loaded onto Apple© digital tablets using the application GIS Pro version 3.18 (Garafa 2016).

The field survey involved undertaking quadrat and relevé surveys to broadly map the vegetation types, populations of potential conservation significant flora and condition boundaries.

GPS locations of vegetation and condition boundaries, quadrats, relevés and flora specimen data were recorded on an Apple© digital tablet using Mobile Data Studio (MDS) version 8.0 (CreativityCorp 2016).

### 4.2.1 Relevés and quadrats

The field survey involved quadrat and relevé surveys to broadly define the vegetation types and condition boundaries, and populations of potential conservation significant flora. Relevés are plotless sampling sites located within distinct vegetation units where only dominant flora species are recorded.

In total, 92 relevés and three 20 m x 20 m quadrats were surveyed across the regional study area (Figure 4-1). Relevés were sampled within vegetation units where changes in dominant species, soils and topography were encountered whilst traversing the study area. Quadrats were sampled to enable vegetation within the widespread major vegetation units to be characterised through recording all flora species present.

This method enabled a more rapid assessment to be undertaken and a greater number of sites to be sampled in comparison to a detailed quadrat based survey where formal plots are required to be established.

The following information was recorded for each sampling site:

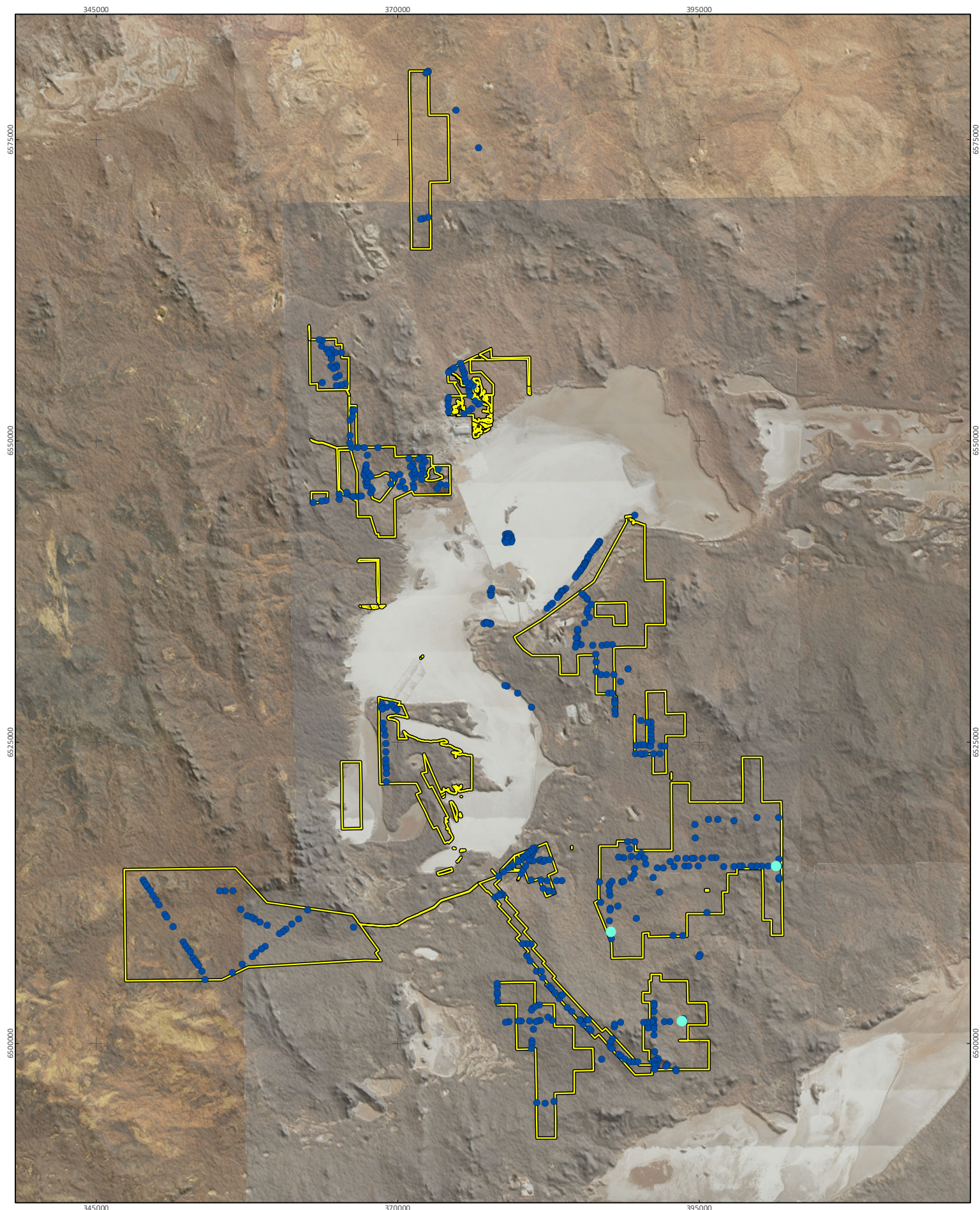
- location – the geographic coordinates in WGS84 projection
- description of vegetation – a broad description utilising the structural formation and height classes based on National Vegetation Information System (NVIS 2003) (Appendix 2)
- habitat – a brief description of landform and habitat
- geology – a broad description of surface soil type and rock type
- disturbance history – a description of any observed disturbance including an estimate of time since last fire, weed invasions, soil disturbance, human activity and fauna activity
- vegetation condition – the condition of the vegetation was recorded utilising the condition scale of (Keighery 1994) (Table 4-2)


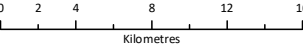





- estimated height and percentage foliage cover (PFC) of each of the taxon in quadrats and dominant species in relevé
- photograph – a colour photograph of the vegetation within each relevé and quadrat.

Species well known to the survey botanists were identified in the field, while unknown species were collected and assigned a unique number to facilitate tracking. Plant species collected during the survey were identified at the Western Australian Herbarium. Plant taxonomists who are considered an authority on a particular plant group were consulted, when necessary.





St Ives Gold Mine		
Project No	1128	
Date	08-Feb-17	
Drawn by	KW	
Map author	KC	
		
1:400,000 (at A4) GDA 1994 MGA Zone 51		

-  Regional study area
-  Relevé site locations
-  Quadrat site locations

**Figure 4-1**

**Relevés and quadrat locations within the regional study area**



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### 4.2.3 Targeted flora searches

Targeted flora searches were undertaken simultaneously with the flora and vegetation survey to determine whether any of the conservation significant flora identified from the desktop and literature review occurred in the regional study area. The searches focused on known records of conservation significant flora and habitats considered likely to support conservation significant flora.

If a flora species was considered to potentially be a conservation significant species (i.e. similar floristic characteristics and occurring within suitable habitat) the following information was collected:

- GPS coordinates, including population boundary where applicable
- description of the habitat and floristic community in which the potential conservation significant species was located
- population size estimate (i.e. estimated number of individual plants) where applicable
- specimen collection for taxonomic identification and lodgement at the WA Herbarium
- photograph of live plant in situ and description of important details, such as flower colour, height of individual or average height of population.

### 4.2.4 Vegetation mapping

The vegetation descriptions from quadrats and relevés recorded during the field survey were grouped according to similarity of community structure (i.e. canopy levels), dominant species composition and the prevalent community structure (i.e. woodland, shrubland, etc.). The vegetation type boundaries (where accessible by vehicle or on foot) were recorded on GPS during the field survey. Vegetation types in areas unable to be accessed were extrapolated utilising high quality colour aerial photography and previous vegetation maps done by Phoenix (2017a), Botanica Consulting (2012d) and Mattiske (1996).

To support delineation of vegetation types, a cluster analysis was conducted based on species presence and absence within each relevé. The fusion strategy for the site classification was flexible UPGMA with a beta value of -0.1 and Kulczynski association measure in the software package PATN (Belbin 2003).

### 4.2.5 Condition mapping

The condition of vegetation was mapped across the regional study area based on the Keighery (1994) scale, the appropriate condition rating scale for the Interzone Botanical Province in which the Eastern Goldfields subregion is located (EPA & DPaW 2015).

The vegetation condition ratings relate to vegetation structure, the level of disturbance and weed cover at each structural layer and the ability of the vegetation unit to regenerate. Vegetation condition ranges from Pristine being the highest rating to Completely Degraded as the lowest (Table 4-2).

**Table 4-2 Vegetation condition rating scale (Keighery 1994)**

Vegetation condition rating	Vegetation condition	Description
1	Pristine	Pristine or nearly so, no obvious signs of disturbance
2	Excellent	Vegetation structure intact, disturbance affecting individual species, and weeds are non-aggressive species
3	Very Good	Vegetation structure altered obvious signs of disturbance
4	Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances retains basic vegetation structure or ability to regenerate it
5	Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not in a state approaching good condition without intensive management
6	Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost without native species

### 4.3 TAXONOMY AND NOMENCLATURE

Plant species were identified using local and regional flora keys, and comparisons with named species held at the WA Herbarium. Nomenclature for flora and vegetation used in this report follows that used by FloraBase (DPaW 2016a) and the WA Herbarium. The conservation status of all recorded flora was compared against the current lists available on FloraBase (DPaW 2016a) and the EPBC Act Threatened species database provided by the Department of the Environment (Department of the Environment 2015).

All *Tecticornia* specimens were identified by Dr Kelly Sheppard, as is the requirement by the EPA for this genus.

### 4.4 SURVEY PERSONNEL

The personnel involved in the survey are presented below (Table 4-3).

**Table 4-3 Project team**

Name	Qualifications	Role/s
Dr Volker Framenau	MSc. (Cons. Biol.); Ph.D. (Zool.)	Project manager, report review
Karen Crews	BSc. Hons. (Env. Mgmt)	Report review
Dr Grant Wells	PhD. (Botany)	Field survey, reporting, taxonomy
Catherine Krens	BSc. (Env. Sc.)	Field survey, reporting
Dr Grace Wells	PhD. (Botany)	GIS
Mrs Kathryn Wyatt	BIS. (GIS); Grad. Cert. (GIS)	GIS
Frank Obbens (WA Herbarium)	BSc. Hons. (Env. Biol.)	Taxonomy
Dr Kelly Shepherd (WA Herbarium)	PhD. (Botany)	Taxonomy – <i>Tecticornia</i> spp.

## 4.5 SURVEY LIMITATIONS

The limitations of the survey have been considered in accordance with the *Technical Guidance: Flora and vegetation surveys for Environmental Impact Assessment* (EPA 2016c) (Table 4-4).

**Table 4-4 Survey limitations**

Limitations	Limitation for this survey?	Comments
Availability of contextual information at a regional and local scale	Yes	The most current aerial imagery available was from 2012. Some images of sections of the regional study area were low resolution resulting in some vegetation boundaries unable to be accurately delineated.
Competency/experience of survey personnel, including taxonomy, and experience in the region surveyed	No	All survey personnel have had more than ten years experience with WA flora and vegetation surveys. The field leader, Dr Grant Wells has worked extensively in the Goldfields region.  Taxonomist Frank Obbens has over 15 years' experience in identification of WA and Goldfield flora and is a specialist taxonomist for <i>Calandrinia</i> species. Dr Kelly Shepherd is a specialist DPaW taxonomist for <i>Tecticornia</i> species.
Proportion of flora recorded and/or collected, and any identification issues	Yes	Some species could not be identified to species level due to insufficient flowering and fruiting material.  The survey was conducted primarily utilising relevés where only dominant species are recorded and as such the species recorded do not represent a comprehensive inventory of the species present.
Effort and extent; was the appropriate area fully surveyed	Yes	Not all vegetation boundaries could be mapped due to lack of serviceable tracks, therefore some vegetation unit boundaries were extrapolated using aerial imagery and the previous broad vegetation mapping by Mattiske (1996) and Botanica Consulting (2012d).  Limited access due to lack of tracks or access restrictions from operating mine sites precluded surveying of some of the regional study area.  Not all conservation significant flora records within the vicinity of the regional study area were visited due to access constraints.
Access within the survey area	Yes	Some areas could not be accessed due to a lack of available tracks, insufficient time to walk to all areas of limited vehicle access and access restrictions due to active mining operations.
Timing, rainfall, season	No	Above average rainfall in August promoted flowering of perennial species. However much of the expected annuals were not present or were dead and at end of their lifecycle.
Disturbance that may have affected the results of the survey	No	No disturbances which interfered with recording the vegetation was present. Low weed cover was present across the regional study area apart from adjacent to tracks or infrastructure. Fire was not evident in most of the regional study area.

## 5 RESULTS

### 5.1 DESKTOP REVIEW

#### 5.1.1 Flora

##### 5.1.1.1 Conservation significant flora

A total of 42 previously recorded conservation significant flora species were identified from the database searches and literature review for the regional study area (Table 5-1):

- three Threatened species, including two listed under the EPBC Act (one Endangered and one Vulnerable) and two listed as Vulnerable under the WC Act
- 18 Priority 1 species, including one listed as Vulnerable under the EPBC Act
- three Priority 2 species
- 13 Priority 3 species
- six Priority 4 species.

**Table 5-1 Conservation significant flora species identified from the desktop review**

Species name	EPBC Act Threatened Flora <sup>1</sup>	WC Act Threatened Flora <sup>1</sup>	DPaW Priority list <sup>1</sup>	Latest record
<i>Acacia crenulata</i>			P3	2015
<i>Acacia dissona</i> var. <i>indoloria</i>			P3	1982
<i>Acacia dorsenna</i>			P1	2012
<i>Acacia kerryana</i>			P2	1981
<i>Acacia websteri</i>			P1	2013
<i>Allocasuarina eriochlamys</i> subsp. <i>grossa</i>			P3	2012
<i>Alyxia tetanifolia</i>			P3	2008
<i>Austrostipa blackii</i>			P3	2012
<i>Austrostipa</i> sp. Carlingup Road (S. Kern & R. Jasper LCH 18459)			P1	2011
<i>Calandrinia</i> sp. Widgiemooltha (F. Obbens & E. Reid FO 9/05)			P1	2015
<i>Cyathostemon divaricatus</i>			P1	2016
<i>Diocirea acutifolia</i>			P3	2013
<i>Eremophila annosocaulis</i>			P3	1990
<i>Eremophila arachnoides</i> subsp. <i>tenera</i>			P1	1997
<i>Eremophila caerulea</i> subsp. <i>merrallii</i>			P4	2005
<i>Eremophila perglandulosa</i>			P1	2006
<i>Eremophila praecox</i>			P1	2005
<i>Eucalyptus jutsonii</i> subsp. <i>jutsonii</i>			P4	1970
<i>Eucalyptus kruseana</i>			P4	2012
<i>Eucalyptus websteriana</i> subsp. <i>norsemanica</i>			P1	2013
<i>Eucalyptus x brachyphylla</i>			P4	2012
<i>Gastrolobium graniticum</i>	EN	VU		

Species name	EPBC Act Threatened Flora <sup>1</sup>	WC Act Threatened Flora <sup>1</sup>	DPaW Priority list <sup>1</sup>	Latest record
<i>Gnephosis intonsa</i>			P3	1958
<i>Grevillea phillipsiana</i>			P1	2006
<i>Lepidosperma lyonsii</i>			P4	2011
<i>Lepidosperma</i> sp. Parker Range (N. Gibson & M. Lyons 2094)			P1	2011
<i>Leucopogon</i> sp. Kambalda (J. Williams s.n. PERTH 07305028)			P3	2015
<i>Melaleuca coccinea</i>			P3	1961
<i>Phebalium clavatum</i>			P2	2013
<i>Philotheca apiculata</i>			P1	2008
<i>Phlegmatospermum eremaeum</i>			P3	1992
<i>Pityrodia scabra</i> subsp. <i>dendrotricha</i>			P3	2012
<i>Prostanthera splendens</i>			P1	2013
<i>Ptilotus procumbens</i>			P1	1978
<i>Ptilotus rigidus</i>			P1	2015
<i>Sowerbaea multicaulis</i>			P4	1891
<i>Stylidium choreanthum</i>			P3	1997
<i>Tecticornia flabelliformis</i>	VU		P1	2004
<i>Tecticornia mellarium</i>			P1	2004
<i>Tetratheca spenceri</i>		VU		2015
<i>Thryptomene</i> sp. Londonderry (R.H. Kuchel 1763)			P1	2015
<i>Trachymene pyrophila</i>			P2	2006

<sup>1</sup> EN – Endangered; VU – Vulnerable, P1–P4 —Priority 1–4.

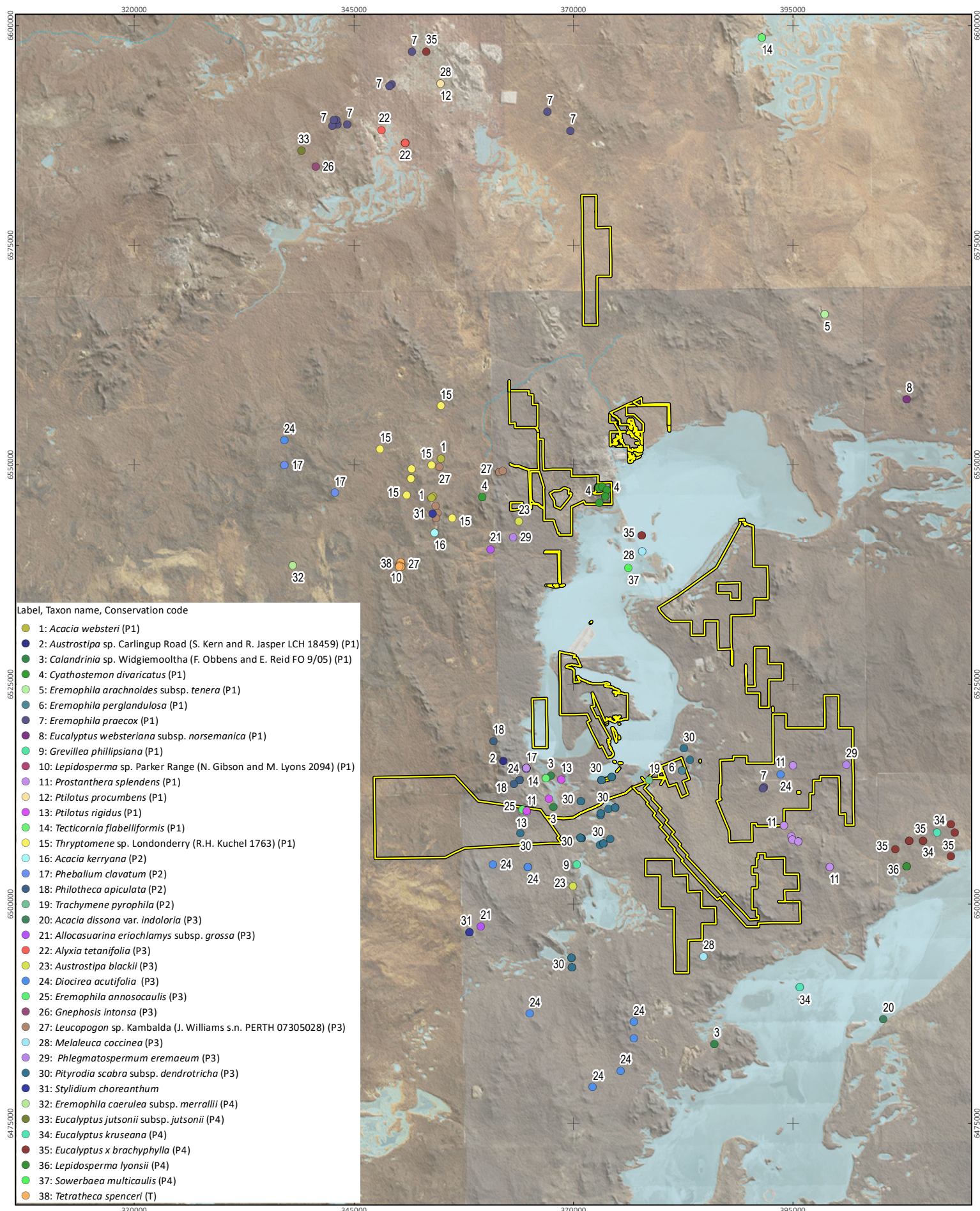
Records of populations of 11 of the Priority Flora identified from the desktop review occurred within the regional study area (Table 5-2; Figure 5-1). None of the Threatened Flora records were from within the regional study area.



The records for three of the species (*Eucalyptus x brachyphylla*, *Melaleuca coccinea* and *Sowerbaea multiflora*) occur in the salt lake (Figure 5-1), which is unsuitable habitat for all three species. Given the date of these records and unsuitability of habitat, it is considered that the locations for these three species/records are erroneous.


**Table 5-2**      **Priority Flora for which there are records within the regional study area**

Species name	Number of records in regional study area
<i>Allocasuarina eriochlamys</i> subsp. <i>grossa</i>	1
<i>Cyathostemon divaricatus</i>	4
<i>Diocirea acutifolia</i>	18
<i>Eremophila annosocaulis</i>	1
<i>Eremophila perglandulosa</i>	1
<i>Eremophila praecox</i>	1
<i>Phlegmatospermum eremaeum</i>	1
<i>Pityrodia scabra</i> subsp. <i>dendrotricha</i>	2
<i>Prostanthera splendens</i>	2
<i>Ptilotus rigidus</i>	1
<i>Trachymene pyrophila</i>	1





St Ives Gold Mine		
Project No	1128	
Date	08-Feb-17	
Drawn by	KW	
Map author	KC	
		
1:550,000 (at A4) <span style="float:right">GDA 1994 MGA Zone 51</span>		

 Regional study area

**Figure 5-1**

**Conservation significant  
flora and vegetation  
identified in the desktop  
review**



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### 5.1.1.2 Introduced flora

The desktop assessment identified records for 30 weed species within and in the vicinity of the regional study area (Table 5-3). Three of the weed species are declared pests, with one being C1 Prohibited (Nodding Thistle) and two with C3 status (Common Heliotrope and Mintweed) under the BAM Act (Table 5-3).

**Table 5-3 Weed species recorded by the desktop review within the vicinity of the regional study area**

Family	Species	Common name	Declared pest
Aizoaceae	<i>Mesembryanthemum crystallinum</i>	Iceplant	
Aizoaceae	<i>Mesembryanthemum nodiflorum</i>	Slender Iceplant	
Asphodelaceae	<i>Asphodelus fistulosus</i>	Onion Weed	
Asteraceae	<i>Carthamus lanatus</i>	Saffron Thistle	
Asteraceae	<i>Gazania linearis</i>		
Asteraceae	<i>Centaurea melitensis</i>	Maltese Cockspur	
Asteraceae	<i>Carduus nutans</i>	Nodding Thistle	S12 (C1 Prohibited)
Asteraceae	<i>Sonchus oleraceus</i>	Common Sowthistle	
Asteraceae	<i>Matricaria recutita</i>	Wild Chamomile	
Asteraceae	<i>Oncosiphon suffruticosum</i>	Calomba Daisy	
Boraginaceae	<i>Heliotropium europaeum</i>	Common Heliotrope	s22(2) (C3)
Brassicaceae	<i>Carrichtera annua</i>	Ward's weed	
Brassicaceae	<i>Sisymbrium irio</i>	London Rocket	
Brassicaceae	<i>Sisymbrium orientale</i>	Indian Hedge Mustard	
Brassicaceae	<i>Brassica tournefortii</i>	Mediterranean Turnip	
Cucurbitaceae	<i>Citrullus lanatus</i>	Pie Mellon	
Cucurbitaceae	<i>Cucumis myriocarpus</i>	Prickly Paddy Melon	
Fabaceae	<i>Medicago minima</i>	Small Burr Medic	
Fabaceae	<i>Medicago polymorpha</i>	Burr Medic	
Geraniaceae	<i>Erodium cicutarium</i>	Common Storksbill	
Lamiaceae	<i>Salvia reflexa</i>	Mintweed	s22(2) (C3)
Lamiaceae	<i>Salvia verbenaca</i>	Wild Sage	
Poaceae	<i>Pentameris airoides</i> subsp. <i>airoides</i>		
Poaceae	<i>Hordeum leporinum</i>	Barley Grass	
Poaceae	<i>Rostraria pumila</i>		
Polygalaceae	<i>Rumex vesicarius</i>	Ruby Dock	
Primulaceae	<i>Lysimachia arvensis</i>	Pimpernel	
Solanaceae	<i>Lycium ferocissimum</i>	African Boxthorn	
Solanaceae	<i>Solanum hystrix</i>	Afghan Thistle	
Solanaceae	<i>Solanum nigrum</i>	Black Berry Nightshade	



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## 5.1.2 Vegetation

### 5.1.2.1 Vegetation types

Mapping conducted for previous regional flora assessments (Botanica Consulting 2012d; Jim's Weeds 2006; Mattiske 1996) overlap with large sections of the current regional study area, particularly Botanica Consulting (2012d). A fourth recent regional survey (Paul Armstrong and Associates 2016) intercepts a small section of the regional study area.

The previous regional surveys conducted for the SIGM tenements have mapped a varying number of vegetation types within the regional study area (for details see Appendix 3):

- Mattiske (1996) mapped 25 vegetation types and an additional five mosaics comprised of two or more of the 25 types defined
- Jim's Weeds (2006) mapped eight broad vegetation types
- Botanica Consulting (2012d) mapped 25 vegetation types
- Paul Armstrong and Associates (2016) mapped seven vegetation types.

The vegetation types defined by Mattiske (1996), Botanica Consulting (2012d) and (Paul Armstrong and Associates 2016) broadly align and include:

- a variety of *Eucalyptus* woodlands over *Triodia* grasses or mixed shrublands
- *Melaleuca* spp. thickets and shrublands
- *Acacia* shrublands
- Chenopod and samphire shrublands
- low *Callitris* spp. woodlands.

### 5.1.2.2 Regionally and locally significant vegetation

The regional study area occurs within the regionally significant Great Western Woodlands (GWW), the largest remaining intact temperate woodland in the world extending from Southern Cross to Kalgoorlie and east to Balladonia, and south to near Ravensthorpe. The GWW is one of the very few large, intact landscapes remaining in temperate Australia, and is of global significance. It contains over 3,000 vascular plant species, representing approximately 20% of Australia's floristic diversity. Land uses within the GWW include Unallocated Crown Land, conservation estate, pastoral leases, timber reserves and mineral exploration and extraction activities (Terratree 2016).

Mattiske (1996) identified two vegetation types as locally significant due to the presence of state listed Priority Flora (Table 5-4) and a third vegetation type as locally significant being a habitat for an undescribed taxon. Each of these vegetation types occur within the regional study area (Appendix 3) In addition, Mattiske (1996) suggested that the following plant communities that occur on the fringes of the salt lake were restricted regionally:

- H1 - Halophytic Complex of *Halosarcia* species on fringes of playa lakes
- H2 - Halophytic Complex dominated by Chenopodiaceae species and *Frankenia pauciflora* on fringes of playa lakes

- 
- S1 - Very open Woodland of *Callitris glaucophylla* with occasional *Eucalyptus griffithsii* over patchy shrubs of *Acacia* species and *Jacksonia arida* (ms) over sparse cover of *Triodia* species on deep aeolian silica sands
  - S2 - Open Shrubland dominated by *Jacksonia arida* (ms) and *Darwinia* aff. *diosmoides* on pale gritty sands on fringes of large salt lake systems
  - S3 - Open Low Scrub of regenerating shrubs including *Melaleuca* species over *Chenopodiaceae* species, mixed shrubs and succulents on disturbed areas on disturbed aeolian silica sands.

With the exception of S3, all of the above vegetation types occur within the regional study area.

Jim's Weeds (2006) identified three vegetation types as conservation significant, all of which occur within the regional study area (Appendix 3).

Botanica Consulting (2012d) identified 12 vegetation types as locally significant due to the presence of Priority Flora (Table 5-4). Botanica Consulting (2012d) also considered one vegetation type as significant due to the presence of a hybrid *Cratystylis* spp., *C. microphylla* x *conocephala*. Six of the locally significant vegetation types occur in the regional study area (Appendix 3):

- Thicket of *Acacia quadrimarginea* over mixed dwarf scrub
- Thicket of *Acacia* sp. narrow phyllode over mixed low scrub
- Heath of *Melaleuca thyoides* over low scrub of *Jacksonia arida* on salt lake edge
- Low woodland of *Eucalyptus lesouefii* and *Eucalyptus ravidia* over scrub of *Acacia* sp. narrow phyllode in creekline
- Open low woodland of *Eucalyptus stricklandii* over heath of *Dodonaea lobulata*
- Low woodland of *Eucalyptus lesouefii* over low scrub of *Eremophila scoparia* and *Dodonaea viscosa* subsp. *angustissima* on stony rise.

A section of the regional study area was identified within the SIGM GIS database as ecologically sensitive leases and requiring flora survey prior to clearing. Vegetation mapping within this area was classified as 'Melaleuca thyoides over low scrub of Jacksonia arida on salt lake edge' by Botanica Consulting (2012d). Botanica Consulting (2012d) identified this vegetation community in association with the Priority 3 (P3) species, *Pityrodia scabra* subsp. *dendrotricha* (then known as *Pityrodia* sp. Yilgarn).

Paul Armstrong and Associates (2016) identified two locally conservation significant vegetation types that are habitat for Priority Flora (Table 5-4) neither of which were recorded in the regional study area (Appendix 3). In addition, one vegetation type, *Eucalyptus transcontinentalis*, was considered to have a restricted distribution. This vegetation type occurs within the regional study area. Paul Armstrong and Associates (2016) determined that a further 15 vegetation types may be considered rare as they represented less than 5% of the study area for their assessment. Three of these vegetation types occur in the regional study area:

- *Acacia acuminata*
- Lakes Edge
- *Melaleuca sheathiana*.

**Table 5-4 Vegetation types of previous assessments considered locally conservation significant due to the presence of conservation significant flora**

Vegetation type	Conservation significant species
<b>Mattiske (1996)</b>	
S2 - Open Shrubland dominated by <i>Jacksonia arida</i> (ms) and <i>Darwinia</i> aff. <i>diosmoides</i> on pale gritty sands on fringes of large salt lake systems	<i>Acacia kalgoorliensis</i> (formerly P3, currently not listed as Threatened)
F5 - Woodland of <i>Eucalyptus salubris</i> var. <i>salubris</i> over mixed low Chenopodiaceae and Asteraceae shrubs species on alkaline clay soils	<i>Acacia kalgoorliensis</i> (formerly P3, currently not listed as threatened)
R1 - Mixed Open Shrubland over mixed Open Herbland (annual Asteraceae, Poaceae and Goodeniaceae species) on rocky hillslopes	Myrtaceae sp. VE 1119 (undescribed species)
<b>Jim's Weeds (2006)</b>	
<i>Eucalyptus stricklandii</i> woodland on ridgelines and breakaways.	<i>Prostanthera splendens</i> (P1)
<i>Eucalyptus</i> over Spinifex sand plains	<i>Trachymene pyrophila</i> (P2)
<i>Acacia</i> shrublands on granite hill rises	<i>Eucalyptus websteriana</i> subsp. <i>norsemanica</i> (P1)
<b>Botanica Consulting (2012d)</b>	
Thicket of <i>Acacia quadrimarginea</i> over mixed dwarf scrub	<i>Allocasuarina eriochlamys</i> subsp. <i>grossa</i> (P3) <i>Cyathostemon divaricatus</i> (P1) <i>Eucalyptus websteriana</i> subsp. <i>norsemanica</i> (P1)
Thicket of <i>Acacia</i> sp. narrow phyllode over mixed low scrub	<i>Austrostipa blackii</i> (P3) <i>Eucalyptus websteriana</i> subsp. <i>norsemanica</i> (P1)
Heath of <i>Melaleuca thyoides</i> over low scrub of <i>Jacksonia arida</i> on salt lake edge	<i>Pityrodia scabra</i> subsp. <i>dendrotricha</i> (P3)
Low woodland of <i>Eucalyptus lesouefii</i> and <i>Eucalyptus ravidia</i> over scrub of <i>Acacia</i> sp. narrow phyllode in creekline	<i>Diocirea acutifolia</i> (P3)
Low forest of <i>Eucalyptus ravidia</i>	<i>Acacia dorsenna</i> (P1) and <i>Diocirea acutifolia</i> (P3)
Low woodland of <i>Eucalyptus lesouefii</i> / <i>Eucalyptus salmonophloia</i> over mixed low scrub	<i>Diocirea acutifolia</i> (P3)
Open low woodland of <i>Eucalyptus salmonophloia</i> / <i>Eucalyptus salubris</i> over mixed low scrub	<i>Diocirea acutifolia</i> (P3)
Open low woodland of <i>Eucalyptus stricklandii</i> over low scrub of <i>Dodonaea lobulata</i> on breakaway	<i>Prostanthera splendens</i> (P1)
Open low woodland of <i>Eucalyptus stricklandii</i> over heath of <i>Dodonaea lobulata</i>	<i>Diocirea acutifolia</i> (P3)
Low woodland of <i>Eucalyptus lesouefii</i> over low scrub of <i>Eremophila scoparia</i> and <i>Dodonaea viscosa</i> subsp. <i>angustissima</i> on stony rise	<i>Diocirea acutifolia</i> (P3)

Vegetation type	Conservation significant species
Open mallee of <i>Eucalyptus loxophleba</i> subsp. <i>lissophloia</i> and <i>Eucalyptus kruseana</i> (P4)	<i>Eucalyptus x brachyphylla</i> (P4) <i>Eucalyptus kruseana</i> (P4) <i>Austrostipa blackii</i> (P3)
Very open mallee of <i>Eucalyptus websteriana</i> over thicket of <i>Acacia quadrimarginea</i> / <i>Acacia</i> sp. narrow phyllode	<i>Allocasuarina eriochlamys</i> subsp. <i>grossa</i> (P3) <i>Austrostipa blackii</i> (P3)
Low heath of <i>Cratystylis microphylla</i>	<i>Cratystylis conocephala x microphylla</i>
<b>Paul Armstrong and Associates (2016)</b>	
<i>Eucalyptus flocktoniae</i>	<i>Leucopogon</i> sp. Kambalda
Rocky outcrops	<i>Acacia crenulata</i> (P3) <i>Cyathostemon divaricatus</i> (P1) <i>Leucopogon</i> sp. Kambalda (P3)

### 5.1.2.3 Threatened and Priority Ecological Communities

No Commonwealth or State listed TECs or DPaW listed PECs intersect the regional study area.

## 5.2 FIELD SURVEY

### 5.2.1 Flora

A total of 164 flora species and subspecies representing 33 families and 65 genera were recorded during the field surveys (Appendix 4). This included 155 perennial species and nine annual or short-lived species.

The most prominent families recorded in the regional study area were Chenopodiaceae, Asteraceae, Myrtaceae and Fabaceae (Table 5-5).

**Table 5-5 Dominant floristic families recorded during the survey in the regional study area**

Family	No. of recorded species
Myrtaceae	31
Scrophulariaceae	23
Chenopodiaceae	18
Fabaceae	15
Asteraceae	10
Poaceae	8
Lamiaceae	7
Amaranthaceae	5

#### 5.2.1.1 Conservation significant flora

No Commonwealth or State listed Threatened Flora were recorded during the field survey. Six Priority Flora species were recorded within the regional study area during the field survey:

- *Allocasuarina eriochlamys* subsp. *grossa* (P3)
- *Calandrinia* sp. *Widgiemooltha* (F. Obbens & E. Reid FO 9/05) (P1)
- *Cryptandra crispula* (P3)
- *Cyathostemon divaricatus* (P1)
- *Diocirea acutifolia* (P3)
- *Pityrodia scabra* subsp. *dendrotricha* (P3).

The field survey identified eight new records of four taxa within the regional study area; *Allocasuarina eriochlamys* subsp. *grossa*, *Calandrinia* sp. *Widgiemooltha*, *Cryptandra crispula* and *Diocirea acutifolia* (Figure 5-2). The remaining species were recorded as confirmations of previous records only (Figure 5-3). All species are discussed further below (section 5.2.1.1.1 – 5.2.1.1.7).

A population of *Prostanthera splendens* (P1) that occurred just outside of the regional study area was confirmed during the current survey (Figure 5-2).

Several additional records for conservation significant flora identified during the desktop review to occur within the regional study area could not be confirmed during the current survey despite thorough foot searches in the vicinity of the recorded locations (Figure 5-3). Some records could not

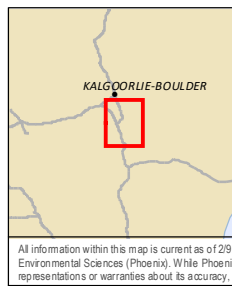
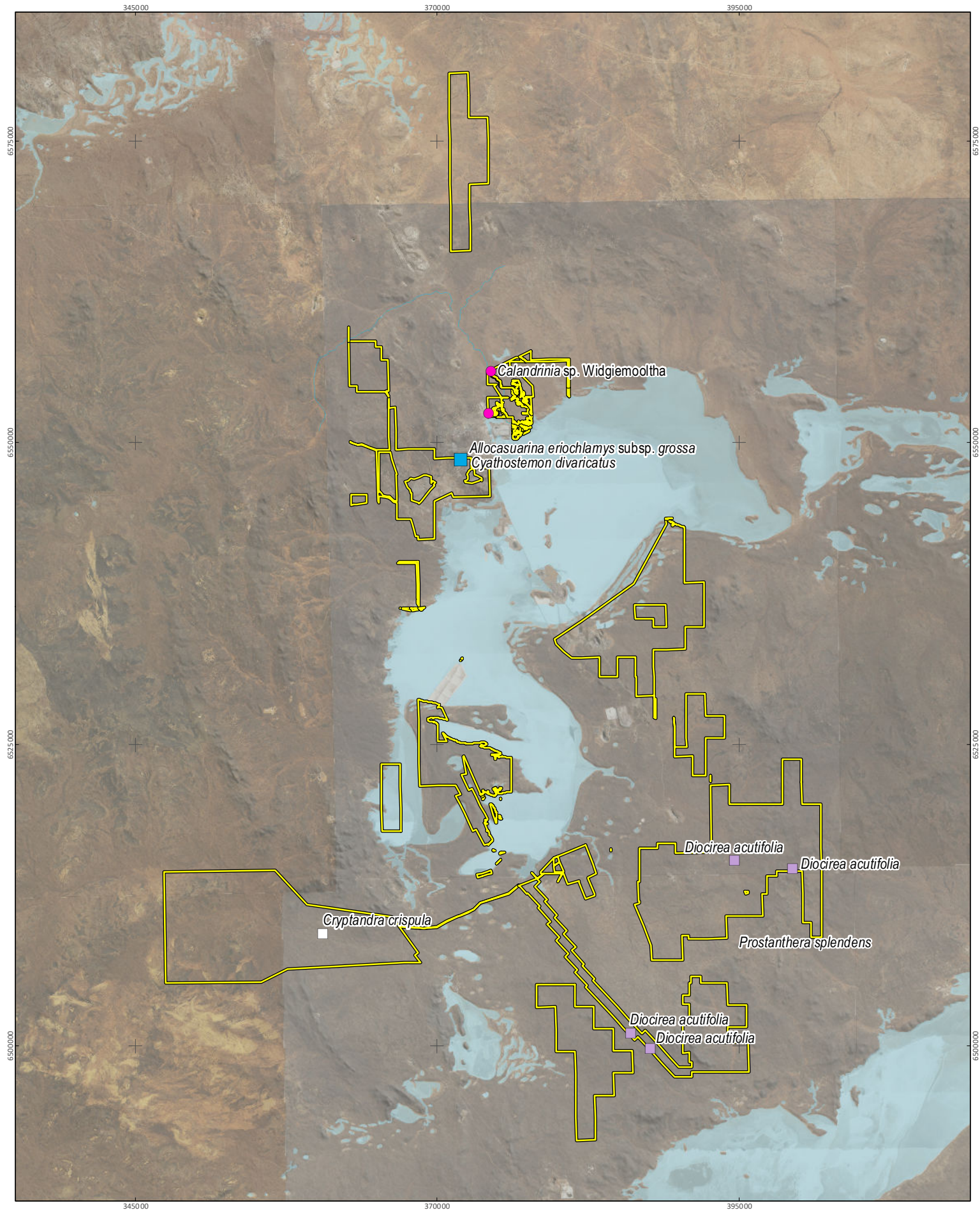


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be confirmed as the location of the record was inaccessible at the time of the survey. Notably, previous surveys had also failed to confirm some of these records (Table 5-6).

Habitats within the regional study area which may support the recorded conservation significant species include:

- *Eucalyptus* woodland on sand dunes on the lake edge (*Pityrodia scabra* subsp. *dendrotricha*)
- *Eucalyptus* woodland on breakaways with pockets of laterite (*Cyathostemon divaricatus* and *Prostanthera splendens*)
- *Acacia* and *Allocasuarina* shrubland on rocky hillslopes (*Allocasuarina eriochlamys* subsp. *grossa* and *Cyathostemon divaricatus*)
- *Eucalyptus* woodlands on hill slopes in red-brown sand (*Cryptandra crispula* and *Diocirea acutifolia*)
- *Eucalyptus* woodland on undulating plain in red-brown sandy-clay or sandy-loam (*Diocirea acutifolia*)
- *Eucalyptus* woodland over a drainage line in red-orange sandy-loamy-clay (*Diocirea acutifolia*)
- chenopod shrublands in seasonally wet areas with clay-loamy soils (*Calandrinia* sp. *Widgiemooltha*).



**St Ives Gold Mine**

Project No	1128
Date	2/9/2017
Drawn by	KW
Map author	KC

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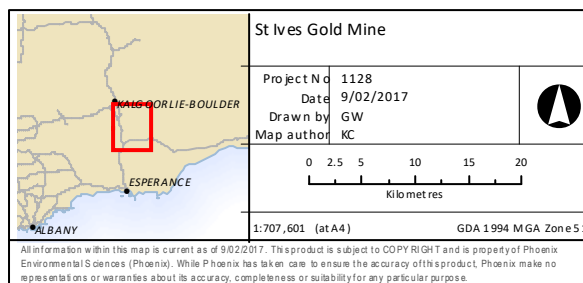
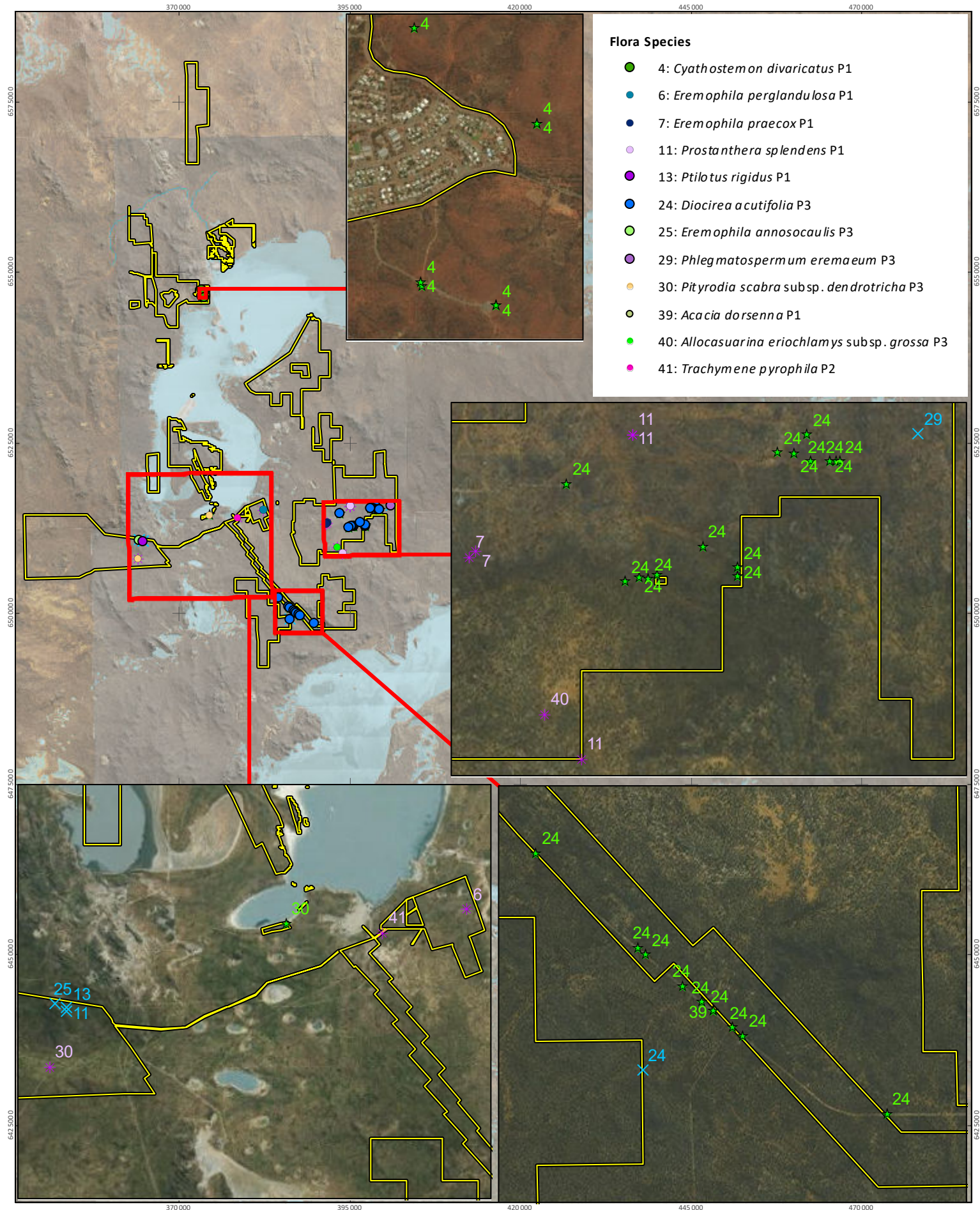
All information within this map is current as of 2/9/2017. This product is subject to COPYRIGHT and is property of Phoenix Environmental Sciences (Phoenix). While Phoenix has taken care to ensure the accuracy of this product, Phoenix make no representations or warranties about its accuracy, completeness or suitability for any particular purpose.

- Regional study area
- *Calandrinia* sp. Widgiemooltha (P1)
- *Allocasuarina eriochlamys* subsp. *grossa* (P3)
- Cryptandra crispula* (P3)
- *Diocirea acutifolia* (P3)

**Figure 5-2**  
**Conservation significant flora recorded during the field survey – new records**

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#### Desktop flora records

- ★ Confirmed
- ✕ Unserved
- ✱ Surveyed, not relocated

Regional study area

#### Figure 5-3

Confirmations of desktop records of conservation significant flora during current survey

**Table 5-6**      **Records of conservation significant species identified in the desktop review as occurring within the regional study area that could not be confirmed during the current survey**

Species name	No. records not confirmed	Comments
<i>Allocasuarina eriochlamys</i> subsp. <i>grossa</i>	1	No <i>Allocasuarina</i> species sighted within a 100 m radius of the record.
<i>Eremophila annosocaulis</i>	1	Location of the record was inaccessible.
<i>Eremophila perglandulosa</i>	2	No plants could be located despite intensive foot searches within a 100 m radius of these records. Botanica Consulting (2012d) failed to find the species at this location and suggested it may have been grazed out by cattle.
<i>Eremophila praecox</i>	2	No plants could be located despite intensive foot searches within a 100 m radius of these records. Several collections of <i>Eremophila</i> species were taken but none were later identified as the conservation significant species. Botanica Consulting (2012d) failed to find this species at this record.
<i>Phlegmatospermum eremaeum</i>	1	Location of the record was inaccessible. Botanica Consulting (2012d) failed to find this species at this record.
<i>Pityrodia scabra</i> subsp. <i>dendrotricha</i>	1	No plants could be located despite intensive foot searches within a 100 m radius of the record. A solitary mature plant was recorded at this location in 2004 and may have perished since this time.
<i>Prostanthera splendens</i>	3	Location of one record was inaccessible. No plants could be located at two records despite intensive foot searches; habitat at these records did not match habitat for the species.
<i>Ptilotus rigidus</i>	1	Location of the record was inaccessible. Record is from 1968 with site details as kopi vegetation on salt lake. Location of record occurs in woodland some distance from any salt lake.
<i>Trachymene pyrophila</i>	1	No plants of this annual species could be located despite intensive foot searches within a 50 m radius of the record. Botanica Consulting (2012d) failed to find this species.

#### 5.2.1.1.1 *Allocasuarina eriochlamys* subsp. *grossa*

Status: Priority 3 (DPaW)

Description: Dioecious or monoecious shrub, 1–3 m high, bracteoles prominently exceeding cone (Figure 5-4).



**Figure 5-4** *Allocasuarina eriochlamys* subsp. *grossa* reference image (Florabase 2017)

Distribution and ecology: This species mainly occurs within the Coolgardie bioregion in the Eastern Goldfields and Southern Cross subregions and has also been recorded further east within the Nullarbor bioregion (DPaW 2017a). It has been recorded at 20 locations (ALA 2017) within habitat including:

- *Acacia quadrimarginea* and *Eremophila clarkei* in shallow gravelly soil on crest of lateritised ridge
- loose gravelly soil at the base of granite outcrops with *Acacia*, *Calothamnus*, *Hybanthus*, *Grevillea* and *Santalum* shrubs and *Triodia scariosa* grassland
- low breakaways
- laterite hillside on thin soil
- red granitic soil amongst granite boulders.

Records and distribution in the regional study area: A new record was made for the regional study area, from a single location (Figure 5-2) on a rocky hillslope in red-orange sandy loam with laterite rocks. It occurred within tall *Acacia burkittii*, *A. quadrimarginea* and *Allocasuarina eriochlamys* subsp. *grossa* shrubland over mid-open *Eremophila georgei*, *Prostanthera incurvata* and *Dodonaea adenophora* shrubland.



#### 5.2.1.1.2 *Calandrinia* sp. Widgiemooltha

Status: Priority 1 (DPaW)

Description: Erect scrambling perennial herb (Figure 5-5).



**Figure 5-5** *Calandrinia* sp. Widgiemooltha

Distribution and ecology: Previously recorded in the Eastern Goldfields subregion of the Coolgardie bioregion (DPaW 2017a). The species was recorded at two locations within the B2018 study area (Phoenix 2017a) and is known from two other records (ALA 2017) with habitat descriptions including:

- extensive saline flats, brown silty loam with some scattered quartz
- samphire community. A tree layer of scattered *Casuarina obesa* with understorey of *Frankenia setosa*, *F. interioris*, *Carpobrotus* sp., *Tecticornia doliiformis* and *Maireana glomerifolia*.

Records and distribution in the regional study area: Specimens were collected from two new locations (Figure 5-2):

- mid sparse *Dodonaea viscosa* and *Acacia kalgoorliensis* shrubland over *Tecticornia leptoclada* subsp. *inclusa*, *T. triandra* and *Disphyma crassifolium* shrubland in red-brown sandy clay/loam
- isolated low *Eucalyptus griffithsii* trees over low *Cratystylis subspinescens*, *Tecticornia* SIRS20 and *Atriplex vesicaria* shrubland and low sparse *Disphyma crassifolium* forbland in red-orange sandy clay/loam.

#### **5.2.1.1.3 *Cryptandra crispula***

Status: Priority 3 (DPaW)

Description: Non-spinescent shrub, 0.25–0.9 m high.

Distribution and ecology: Previously recorded in the Eastern Goldfields and Southern Cross subregions of the Coolgardie bioregion (DPaW 2017a). The species has been recorded at nine locations (ALA 2017) with habitat including:

- brown sandy clay, yellow loamy sand, red soil, pebbles. Dune ridges, hills, near salt lakes
- open mallee woodland in brown clayey sand on a hill
- on a flat in yellow-brown sand
- *Eucalyptus platycorys* woodland on dune peripheral to salt lake
- flat plain in yellow loamy sand.

Records and distribution in the regional study area: This species was recorded from a single location and represents a new record for the regional study area (Figure 5-2). It occurred on a gentle hillslope in red-brown sand in mid *Eucalyptus celastroides* subsp. *celastroides*, *E. transcontinentalis* and *E. yilgarnensis* woodland over mid *Bertya dimerostigma*, *Grevillea huegelii* and *Santalum acuminatum* shrubland over low open *Cryptandra crispula* shrubland over mid open *Lepidosperma sanguinolentum*, *Lomandra effusa* and *Schoenus subaphyllus* sedgeland.

#### **5.2.1.1.4 *Cyathostemon divaricatus***

Status: Priority 1 (DPaW)

Description: Divaricately branching often low and spreading shrub up to 1 m tall and 0.75 m wide (Trudgen & Rye 2014) with pink tinged white flowers recorded April to May and August to September (Figure 5-6).





**Figure 5-6**      *Cyathostemon divaricatus*

Distribution and ecology: Only recorded in the Eastern Goldfields subregion of the Coolgardie bioregion (DPaW 2017a), this species is known from two locations (ALA 2017) with habitat recorded as:

- rocky hill slope in low mixed shrubland of *Eremophila clarkei*, *Thryptomene australis* over annual Asteraceae and grass species
- rocky hill slope in *Acacia resinomarginea* scrub.

Records and distribution in the regional study area: This species was confirmed at the location of three previous records in the regional study area (Figure 5-3). No new populations were recorded. It occurred on moderate to steep laterite hillslopes in tall *Acacia burkittii* and *A. quadrimarginea* and *Allocasuarina eriochlamys* subsp. *grossa* shrubland over mid-open *Eremophila georgei*, *Prostanthera incurvata* and *Dodonaea adenophora* shrubland.

#### 5.2.1.1.5 *Diocirea acutifolia*

Status: Priority 3 (DPaW)

Description: Low, dense, rounded shrub, 0.3–0.8 m high with white flowers recorded November to December (Figure 5-7).



**Figure 5-7** *Diocirea acutifolia*

Distribution and ecology: Recorded in the Eastern Goldfields and Southern Cross subregions of the Coolgardie bioregion (DPaW 2017a) the species is known from 13 locations (ALA 2017) with habitat including:

- flat of red-brown clay loam
- *Eucalyptus salmonophloia* and *E. campaspe* woodland with *Atriplex vesicaria* and *Eremophila scoparia* in red clay-loam
- *Eucalyptus* woodland over tall *Melaleuca* shrubland
- *Eucalyptus salmonophloia* woodland with *Melaleuca* and *Atriplex* in red gravelly loam on an undulating plain
- *Eucalyptus* woodland with *eremophila dempsteri* and *Maireana sedifolia* shrubland over *Eremophila decipiens*, *Atriplex nummularia* and *A. vesicaria*
- *Eucalyptus flocktoniae* and *E. salmonophloia* woodland over *Eremophila scoparia* in red-brown powdery loam.



Records and distribution in the regional study area: This species was recorded at four new locations in the regional study area close to known records (Figure 5-2). It was also confirmed at the locations of several previous records (Figure 5-3). The species was recorded within habitat described as:

- undulating plain in red-orange sandy-clay in mid *Eucalyptus salmonophloia* woodland over mid-open *Eremophila drummondii* shrubland over low *Eremophila decipiens*, *Atriplex vesicaria* and *Atriplex nummularia* shrubland
- drainage line in red-orange sandy-loamy-clay in mid *Eucalyptus salmonophloia*, *E. lesouefii* and *E. celastroides* subsp. *celastroides* woodland over tall-open *Eremophila interstans* and *E. scoparia* shrubland over mid-open *Senna artemisioides* subsp. *petiolaris*, *Scaevola spinescens* and *Atriplex nummularia* shrubland
- gentle hillslope in red-brown sandy-loamy-clay in mid *Eucalyptus salmonophloia*, *E. celastroides* subsp. *celastroides*, *E. lesouefii* and *E. ravida* woodland over tall sparse *Eremophila dempsteri* and *Santalum acuminata* shrubland over mid open *Cratystylis conocephala*, *Atriplex nummularia* and *Maireana sedifolia* shrubland over low open *Diocirea acutifolia* and *Nitraria billardiarei* shrubland
- undulating plain in red-brown alluvial sandy-loam in mid *Eucalyptus ravida* woodland over mid-open *Eremophila dempsteri* and *Santalum acuminata* shrubland over low open *Atriplex bunburyana* and *Diocirea acutifolia* shrubland.

At some locations, *Diocirea acutifolia* dominated the lower shrub stratum with hundreds of plants present (Figure 5-8).



**Figure 5-8 Lower shrub layer dominated by *Diocirea acutifolia* (P3)**

#### 5.2.1.1.6 *Pityrodia scabra* subsp. *dendrotricha*

Status: Priority 3 (DPaW)

Description: Viscid shrub, 0.7–1.4 m high with white flowers recorded from March to October (Figure 5-9).



**Figure 5-9** *Pityrodia scabra* subsp. *dendrotricha*

Distribution and ecology: Recorded in the Eastern Goldfields and Southern Cross subregions of the Coolgardie bioregion and the Western Mallee subregion of the Mallee bioregion (DPaW 2017a), the species is known from nine locations (ALA 2017) in habitat including:

- low plain, upslope edge of Lake Lefroy, yellow sand
- flat on lake edge with moist orange-yellow sand
- sand dune ridge on lake edge with moist yellow sand
- flat on drainage line to lake edge, dry red-orange sandy loam.

Records and distribution in the regional study area: Five plants were recorded at one location of a previous record (Figure 5-3). The site was a mid to upper slope of a sand dune on the edge of Lake Lefroy in orange-yellow sand in *Eucalyptus stricklandii* woodland over tall-sparse *Acacia ligulata*, *Callitris columellaris* and *Grevillea juncifolia* shrubland over isolated mid *Seringia velutina* shrubs over low-sparse *Triodia irritans* hummock grassland.



#### 5.2.1.1.7 *Prostanthera splendens*

Status: Priority 1 (DPaW)

Description: Erect, openly branched shrub, 0.2–1 m high with blue-purple flowers recorded August to October (Figure 5-10).



**Figure 5-10** *Prostanthera splendens*

Distribution and ecology: Recorded in the Eastern Goldfields subregion of the Coolgardie bioregion and the Eastern Mallee subregion of the Mallee bioregion (DPaW 2017a), the species is known from six locations (ALA 2017) with habitat including:

- ledge above the NW aspect of a NE/SW running breakaway with skeletal orange sand with lateritic gravel in open *Eucalyptus* woodland with sparse shrub layer containing *Ptilotus* sp., *Calytrix* sp., and *Dodonaea* sp.
- on breakaway in open *Eucalyptus stricklandii* woodland
- gentle slope, moist with some leaf litter, grey sand over clay.
- plain, dry red gravel.

Records and distribution in the current survey: This species was not recorded in the regional study area but was confirmed at a known location on a laterite breakaway in low-open *Eucalyptus stricklandii* woodland over tall-sparse *Acacia tetragonophylla* and *Alyxia buxifolia* shrubland over sparse-mid *Dodonaea lobulata* shrubland over low-sparse *Calytrix tetragona*, *Prostanthera splendens* and *Ptilotus helichrysoides* shrubland (Figure 5-2).



### 5.2.1.2 Introduced flora

A total of four introduced species were recorded in the regional study area (Table 5-7). All have wide distributions in WA and the records from the regional study area do not represent range extensions. None of the species are declared pests or WoNS. None of the species were widespread within the regional study area and all were recorded at only one or two locations (Table 5-7).

All species with the exception of *\*Schismus arabicus* were recorded in previous surveys.

**Table 5-7 Introduced flora species recorded in the regional study area**

Weed species	No. of survey locations
<i>*Mesembryanthemum nodiflorum</i>	1
<i>*Oncosiphon suffruticosum</i>	1
<i>*Salvia verbenaca</i>	1
<i>*Schismus arabicus</i>	2

### 5.2.1.3 Range extensions

Records in the regional study area represented a range extension for *Scaevola bursariifolia*. The species closest known population occurs approximately 100 km south on the border of the Coolgardie and Mallee bioregions. Its occurrence in the regional study area may be considered locally significant as it represents the northern limit of the known distribution.

### 5.2.1.4 Unidentified flora

At the time of preparing this report nine taxa could not be identified to the species level, in most instances as a result of insufficient taxonomic characters, as plants were sterile (lacking reproductive structures) or reproductive structures were too old/dry and damaged (Table 5-8).

**Table 5-8 Unidentified flora taxa recorded during the field survey**

Unidentified taxon	Comments
<i>Calandrinia</i> sp. intergrade	Apparent intergrade between <i>Calandrinia</i> sp. Widgiemooltha and <i>C. eremaea</i>
<i>Tecticornia</i> SIRS20	Sterile
<i>Cyathostemon</i> SIRS1	Sterile
<i>Eucalyptus websteriana</i> ?subsp. <i>websteriana</i>	Apparent intergrade between the two subspecies.
<i>Lepidosperma</i> ? <i>viscidum</i>	Insufficient material to identify to one species
<i>Phebalium</i> ? <i>lepidotum</i>	Reproductive structures too dry.
<i>Triodia</i> ? <i>irritans</i>	Inflorescences too dry and lack sufficient structures
<i>Triodia</i> ? <i>scariosa</i>	Inflorescences too dry and lack sufficient structures
<i>Trymalium</i> ? <i>myrtillus</i> subsp. <i>myrtillus</i>	Insufficient material to identify definitively to subspecies

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## 5.2.2 Vegetation

### 5.2.2.1 Vegetation types

A total of 34 vegetation types were defined for the regional study area (Table 5-9, Table 5-10; Figure 5-11). These comprised 24 woodland and 10 shrubland vegetation types. A mosaic of the three vegetation types S2, S3 and C3 was mapped where it was difficult to identify boundaries from aerial images. A large section of the regional study area has been mapped as 'no access' as this area could not be traversed due to active mining operations.


The woodland vegetation types were the most dominant representing 87.04% of the vegetation in the regional study area. Woodland W4 was the most dominant vegetation type and covered almost twice the area as the next most abundant vegetation type, woodland W16 (Table 5-9). Typically, the cluster analysis of the sites produced distinct super groups and floristic groups based on dominant species composition and structure (Figure 5-12). In assigning the vegetation types, five sites were omitted from the grouping in the dendrogram and assigned a different vegetation type as their structure and/or dominant species composition (Appendix 5) clearly did not reflect that of the floristic group in which they were placed by UPGMA:



- Sites RS011 and RS046 were grouped with sites allocated to W8 and RS033 was grouped with sites allocated to W20 in the dendrogram due to similar species compositions in the shrub layer. These sites were regrouped into woodland type W21 as they all occurred on rocky hilltops with *Eucalyptus torquata* the dominant species and this vegetation type was conspicuous across the regional study area within this habitat.
- Site RS096 was grouped with sites allocated to W11 in the dendrogram due to a similar species composition in the shrub layer but was removed from this group and named W23 as the tree layer was dominated by *Pittosporum angustifolium* rather than *Eucalyptus* spp.
- Site RS073 was grouped with sites allocated to W17 in the dendrogram but was separated into woodland vegetation type W24 due to the closed *Acacia burkittii* shrubland layer that was absent from other sites grouped as W17.

**Table 5-9 Extent of vegetation types in the regional study area**



Vegetation type	Vegetation code	Area (ha)	Area (%)	Percentage within vegetated areas (%)
Woodland	W1	887.1	1.47	1.55
Woodland	W2	14.1	0.02	0.02
Woodland	W3	504.9	0.84	0.88
Woodland	W4	11,336.8	18.82	19.77
Woodland	W5	574.9	0.95	1.00
Woodland	W6	2,616.1	4.34	4.56
Woodland	W7	1,248.0	2.07	2.18
Woodland	W8	3,467.9	5.76	6.05
Woodland	W9	2,142.1	3.56	3.74
Woodland	W10	117.7	0.20	0.21
Woodland	W11	604.4	1.00	1.05
Woodland	W12	5,203.8	8.64	9.07
Woodland	W13	1,035.4	1.72	1.81
Woodland	W14	281.3	0.47	0.49
Woodland	W15	2,173.6	3.61	3.79
Woodland	W16	5,771.3	9.58	10.06
Woodland	W17	4,858.1	8.07	8.47
Woodland	W18	1,677.0	2.78	2.92
Woodland	W19	86.2	0.14	0.15
Woodland	W20	4,193.6	6.96	7.31
Woodland	W21	454.2	0.75	0.79
Woodland	W22	583.8	0.97	1.02
Woodland	W23	10.1	0.02	0.02
Woodland	W24	73.6	0.12	0.13
Shrubland	C1	645.8	1.07	1.13
Shrubland	C2	266.0	0.44	0.46
Shrubland	C3	194.9	0.32	0.34
Shrubland	R1	29.8	0.05	0.05
Shrubland	R2	128.5	0.21	0.22
Shrubland	S2	869.4	1.44	1.52
Shrubland	S3	1.1	0.00	0.00
Shrubland	S8	492.7	0.82	0.86
Shrubland	S9	1,581.5	2.63	2.76
Shrubland	S10	12.2	0.02	0.02
Shrubland	Mosaic	131.3	0.22	0.23
No access		3,077.8	5.11	5.37
Salt lake playas and claypans		1,333.2	2.21	
Disturbed/developed		1,543.5	2.56	
<b>Total:</b>		<b>60,223.8</b>	<b>100</b>	<b>100</b>



**Table 5-10**      **Vegetation types recorded in the regional study area**



Vegetation type	Site	Vegetation description	Photograph
<b>Woodlands</b>			
W1 <sup>1</sup>	<sup>2</sup> SI003	<i>Eucalyptus salmonophloia</i> isolated trees over <i>Eremophila decipiens</i> subsp. <i>decipiens</i> and <i>E. rugosa</i> mid shrubland over low sparse chenopod shrubland	



Vegetation type	Site	Vegetation description	Photograph
W2 <sup>1</sup>	<sup>2</sup> RIP025, RIP026, RIP029, SI028, SI048	<i>Callitris columellaris</i> tall shrubland over <i>Acacia ligulata</i> , <i>Cratystylis</i> spp. and <i>Eremophila</i> spp. mid open shrubland over low sparse chenopod shrubland.	
W3 <sup>1</sup>	<sup>2</sup> SI002, SI004, SI005, SI006, SI018A, SI023, SI055, SI056, SI057	<i>Eucalyptus salubris</i> mid woodland occasionally with other <i>Eucalyptus</i> trees present over patches of <i>Melaleuca sheathiana</i> tall shrubland over <i>Cratystylis conocephala</i> , <i>Senna artemisioides</i> subsp. <i>petiolaris</i> and <i>Eremophila</i> spp. mid sparse to open shrubland over low sparse mixed shrubland.	





Vegetation type	Site	Vegetation description	Photograph
W4	RS003a, RS010, RS015, RS016, RS017, RS020, RS028, RS031, RS068, RS071, RS093	<i>Eucalyptus lesouefii</i> and/or <i>E. oleosa</i> subsp. <i>oleosa</i> mid woodland over <i>Cratystylis conocephala</i> , <i>Eremophila scoparia</i> and <i>Scaevola spinescens</i> mid shrubland occasionally with <i>Triodia scariosa</i> or <i>T. irritans</i> low sparse hummock grassland.	
<sup>1</sup> W5	<sup>2</sup> SI030, SI031, SI038, SI040, SI041, SI047	<i>Eucalyptus griffithsii</i> mid woodland frequently with other <i>Eucalyptus</i> spp. over <i>Acacia</i> and <i>Eremophila</i> spp. tall shrubland over mixed low shrubs.	

Vegetation type	Site	Vegetation description	Photograph
W6	RS079, RS081, RS082	<i>Eucalyptus striatocalyx</i> mid woodland over <i>Acacia ligulata</i> mid sparse to open shrubland over <i>Triodia irritans</i> low hummock grassland.	
W7	RS039, RS040, RS078	Mosaic of <i>Eucalyptus</i> spp. mid woodland over sparse mixed shrubland over <i>Triodia irritans</i> hummock grassland.	



Vegetation type	Site	Vegetation description	Photograph
W8	RS001, RS012, RS013, RS036, RS060, RS061, RS062, RS063, RS064, RS067	<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i> , <i>E. lesouefii</i> woodland and <i>E. transcontinentalis</i> mid woodland over <i>Alyxia buxifolia</i> , <i>Eremophila scoparia</i> , <i>Melaleuca sheathiana</i> and <i>Santalum acuminatum</i> tall shrubland over <i>Halgania andromedifolia</i> , <i>Scaevola spinescens</i> and <i>Senna artemisioides</i> subsp. <i>petiolaris</i> mid shrubland.	
W9	RS002, RS005, RS008, RS034, RS037	<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i> , <i>E. lesouefii</i> and <i>E. salmonophloia</i> woodland mid woodland over <i>Eremophila ionantha</i> , <i>E. scoparia</i> and <i>Cratystylis conocephala</i> shrubland over <i>Westringia cephalantha</i> low shrubland.	



Vegetation type	Site	Vegetation description	Photograph
W10	RS025, RS095	<i>Eucalyptus lesouefii</i> and <i>E.salmonophloia</i> mid woodland over <i>Exocarpos aphyllus</i> , <i>Scaevola spinescens</i> shrubland.	
W11	RS077, RS094, RS098,	<i>Eucalyptus griffithsii</i> , <i>E. oleosa</i> subsp. <i>oleosa</i> , <i>E. salmonophloia</i> and <i>E. salubris</i> mid woodland over <i>Dodonaea</i> spp. tall shrubland over <i>Senna artemisioides</i> subsp. <i>petiolaris</i> and <i>Scaevola spinescens</i> mid shrubland.	







Vegetation type	Site	Vegetation description	Photograph
W12	RS014, RS038, RS057, RS066	<i>Eucalyptus salmonophloia</i> , <i>E. salubris</i> and <i>E. transcontinentalis</i> mid woodland over <i>Eremophila ionantha</i> , <i>E. scoparia</i> , <i>Melaleuca pauperiflora</i> subsp. <i>fastigiata</i> tall shrubland over <i>Acacia hemiteles</i> and <i>Cratystylis conocephala</i> low shrubland.	
W13	RS051, RS052	<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i> , <i>E. transcontinentalis</i> and <i>E. yilgarnensis</i> mid woodland over mixed shrubland.	





Vegetation type	Site	Vegetation description	Photograph
W14	RS050, RS065	<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i> and <i>E. griffithsii</i> mid woodland over mixed shrubland.	
W15	RS041, RS042, RS053	<i>Eucalyptus celastroides</i> subsp. <i>virella</i> , <i>E. lesouefii</i> and <i>E. urna</i> mid woodland over <i>Melaleuca</i> spp. tall shrubland over <i>Eremophila caperata</i> mid shrubland.	

Vegetation type	Site	Vegetation description	Photograph
W16	RS003, RS022, RS030, RS035, RS043, RS059, RS072	<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i> , <i>E. lesouefii</i> , <i>E. ravidia</i> and <i>E. salmonophloia</i> mid woodland over <i>Eremophila dempsteri</i> , <i>E. scoparia</i> tall shrubland over <i>Atriplex bunburyana</i> , <i>A. nummularia</i> , <i>A. vesicaria</i> and <i>Tecticornia doliiformis</i> chenopod shrubland.	
W17	RS003b, RS004, RS006, RS007, RS009, RS024, RS026, RS044, RS045, RS047, RS069, RS076, RS087	<i>Eucalyptus lesouefii</i> , <i>E. salmonophloia</i> and <i>E. salubris</i> mid woodland over <i>Eremophila interstans</i> , <i>E. scoparia</i> and <i>Santalum acuminatum</i> tall shrubland over <i>Atriplex vesicaria</i> , <i>Maireana sedifolia</i> and <i>Tecticornia doliiformis</i> chenopod shrubland.	



Vegetation type	Site	Vegetation description	Photograph
W18	RS018, RS019, RS021, RS075, RS088,	<i>Eucalyptus salubris</i> and <i>E. salmonophloia</i> mid woodland over <i>Eremophila</i> spp. tall shrubland over <i>Atriplex nummularia</i> , <i>A. vesicaria</i> and <i>Maireana sedifolia</i> chenopod shrubland.	
W19	RS027, RS029	<i>Eucalyptus stricklandii</i> and <i>E. celastroides</i> subsp. <i>celastroides</i> mid woodland <i>Alyxia buxifolia</i> and <i>Eremophila psilocalyx</i> tall open shrubland over mixed low shrubland.	



Vegetation type	Site	Vegetation description	Photograph
W20	RS055, RS056, RS090	<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i> and <i>E. oleosa</i> subsp. <i>oleosa</i> mid woodland over <i>Acacia</i> and <i>Melaleuca</i> spp. tall shrubland over <i>Grevillea acuaria</i> and <i>Westringia cephalantha</i> shrubland.	
W21	RS011, RS033, RS046	<i>Eucalyptus torquata</i> and mixed <i>Eucalyptus</i> spp. mid woodland over <i>Acacia quadrimarginea</i> , <i>Allocasuarina helmsii</i> tall shrubland over <i>Halgania andromedifolia</i> and <i>Westringia cephalantha</i> shrubland.	







Vegetation type	Site	Vegetation description	Photograph
W22	RS049	Low open <i>Eucalyptus websteriana</i> subsp. <i>websteriana</i> , <i>E. celastroides</i> subsp. <i>celastroides</i> and <i>Brachychiton gregorii</i> woodland over tall sparse <i>Acacia burkittii</i> shrubland over low sparse <i>Enchylaena tomentosa</i> and <i>Ptilotus obovatus</i> shrubland over isolated low <i>Podolepis capillaris</i> forbs and mixed grasses.	
W23	RS096	Low <i>Pittosporum angustifolium</i> low woodland over mid <i>Senna artemisioides</i> subsp. <i>petiolaris</i> , <i>Dodonaea viscosa</i> and <i>Maireana sedifolia</i> shrubland over low sparse <i>Scaevola spinescens</i> and <i>Atriplex vesicaria</i> shrubland.	





Vegetation type	Site	Vegetation description	Photograph
W24	RS073	Mid open <i>Eucalyptus salmonophloia</i> woodland over tall closed <i>Acacia burkittii</i> shrubland over isolated mid <i>Eremophila decipiens</i> and <i>Senna artemisioides</i> subsp. <i>petiolaris</i> shrubs.	
<b>Shrublands</b>			
C1 <sup>1</sup>	<sup>2</sup> RIP003, RIP008, RIP038, RIP046, SI010	Isolated mid to tall mixed shrubs over <i>Frankenia</i> and <i>Tecticornia</i> spp. over low open shrubland.	


Vegetation type	Site	Vegetation description	Photograph
C2 <sup>1</sup>	<sup>2</sup> RIP020, RIP021, RIP045, SI017A	<i>Tecticornia</i> and <i>Frankenia</i> spp. low shrubland.	
C3 <sup>1</sup>	<sup>2</sup> SI046, SI057A, SI059	<i>Cratystylis</i> and <i>Eremophila</i> spp. mid open shrubland over low sparse to open mixed shrubland.	

Vegetation type	Site	Vegetation description	Photograph
R1 <sup>1</sup>	<sup>2</sup> RIP001, RIP002, RIP004A, RIP005, RIP006, RIP007, RIP012, RIP015, RIP017, RIP018, RIP019, RIP022, RIP023, RIP024, RIP027, RIP028, RIP032, RIP037, RIP040, RIP044, SI007, SI010A, SI012, SI026, SI026A, SI051, SI051B, SI060	<i>Acacia ligulata</i> , <i>Jacksonia arida</i> and <i>Melaleuca</i> spp. mid isolated shrubs to open mixed shrubland occasionally with an overstorey of <i>Allocasuarina</i> spp. and/or <i>Callitris columellaris</i> low open woodland.	
R2 <sup>1</sup>	<sup>2</sup> RIP005A, RIP010, RIP014, RIP034, RIP036, RIP042, SI013, SI015	<i>Melaleuca thyoides</i> and <i>Jacksonia arida</i> mid to tall open shrubland over <i>Darwinia</i> sp. Karonie low sparse to open shrubland.	

Vegetation type	Site	Vegetation description	Photograph
S2	RS048, RS070, RS089, RS091, RS092	<i>Acacia</i> , <i>Eremophila</i> and <i>Dodonaea</i> spp. mid sparse to open shrubland occasionally with an overstorey of <i>Eucalyptus</i> spp. over <i>Atriplex</i> , <i>Maireana</i> and <i>Tecticornia</i> spp. low sparse to open chenopod shrubland.	
S3 <sup>1</sup>	<sup>2</sup> SI035, SI037, SI045	<i>Acacia quadrimarginea</i> tall shrubland over mid sparse mixed shrubland over <i>Enchylaena tomentosa</i> and <i>Rhagodia drummondii</i> low sparse chenopod shrubland.	

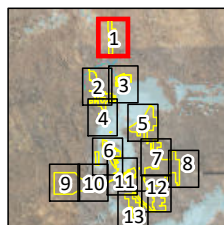
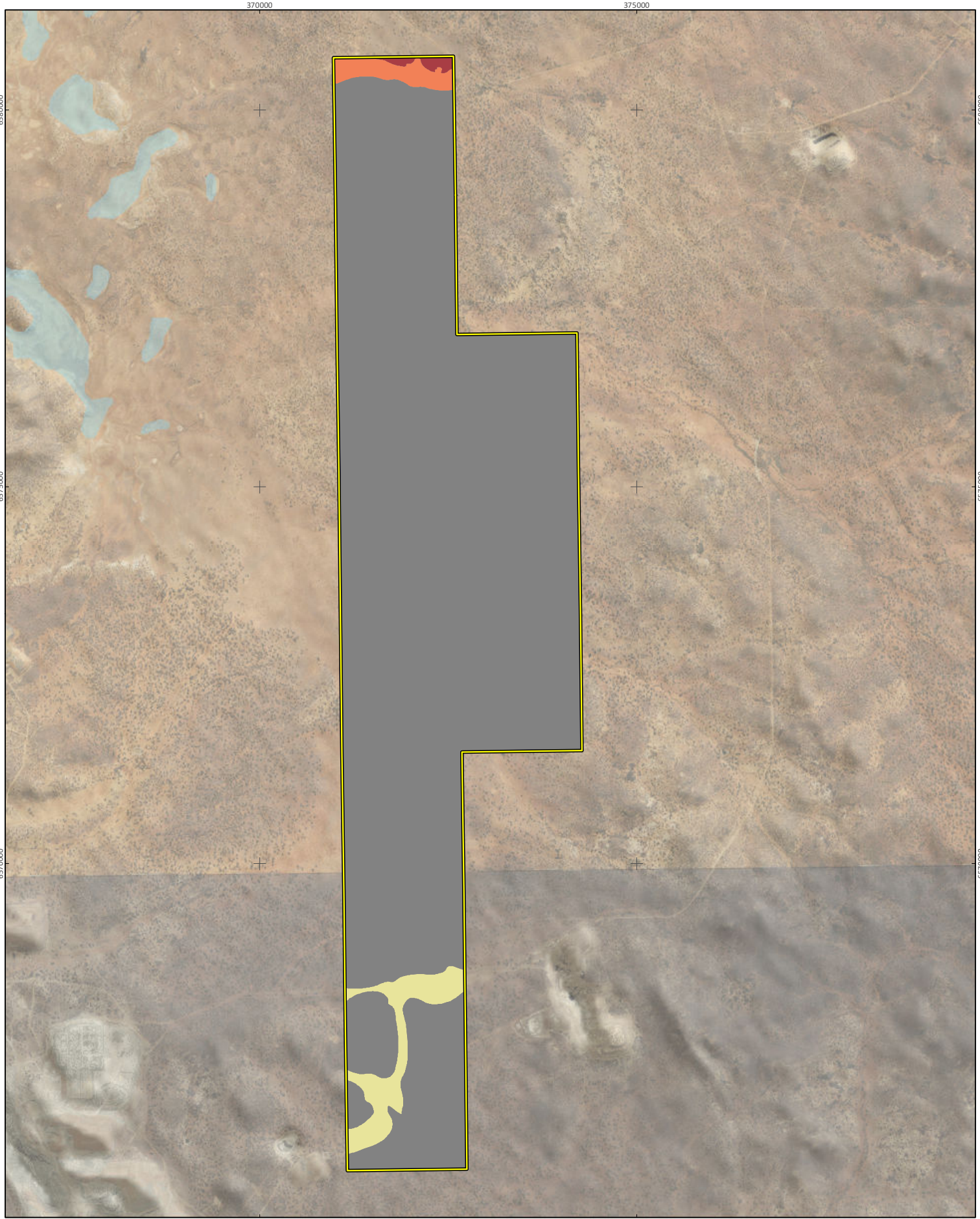


Vegetation type	Site	Vegetation description	Photograph
S8	RS032, RS080, RS097	<i>Acacia burkittii</i> , <i>Acacia quadrimarginea</i> and <i>Allocasuarina eriochlamys</i> subsp. <i>grossa</i> tall shrubland with isolated <i>Eucalyptus</i> spp. trees over <i>Dodonaea</i> and <i>Eremophila</i> spp.	
S9	RS054, RS058	<i>Eucalyptus leptopoda</i> subsp. <i>subluta</i> mallee woodland over <i>Melaleuca</i> spp. tall shrubland over <i>Cyathostemon</i> SIRS1 low shrubland.	

Vegetation type	Site	Vegetation description	Photograph
S10	RS086	Isolated low <i>Eucalyptus celastroides</i> subsp. <i>celastroides</i> trees over mid open <i>Maireana sedifolia</i> , <i>Cratystylis microphylla</i> and <i>Lycium australe</i> shrubland over isolated low <i>Maireana glomerifolia</i> shrubs.	

<sup>1</sup> Presence of the vegetation type in the regional study area determined by extrapolation of boundaries from adjacent areas in the B2018 study area (Phoenix 2017a) and aerial photography.

<sup>2</sup> Quadrat locations within the B2018 study area (Phoenix 2017a) from which the vegetation type was defined.

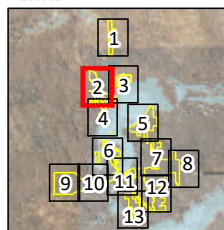
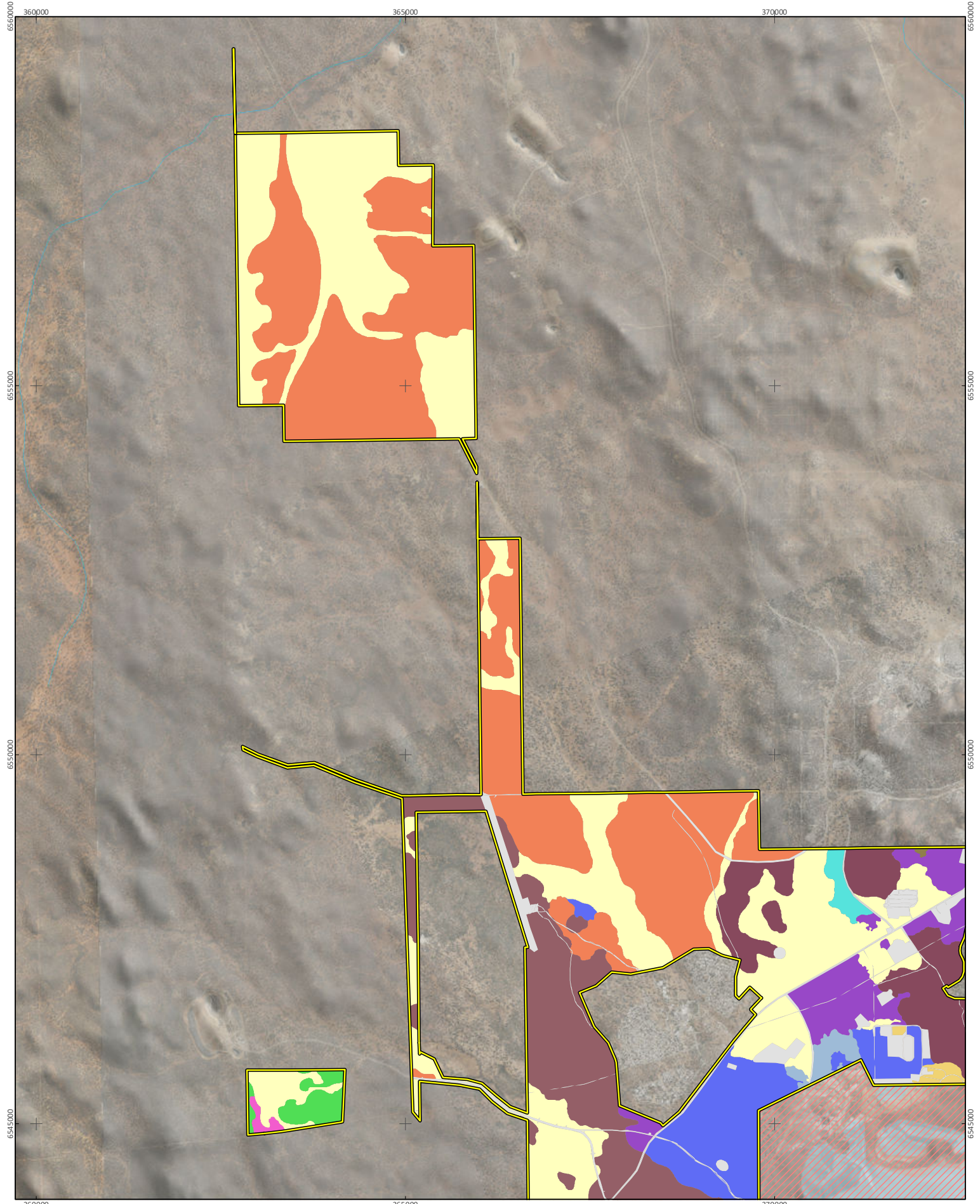


St Ives Gold Mine	
Project No	1128
Date	01-Mar-17
Drawn by	KW
Map author	KC
1:65,000 (at A4)	GDA 1994 MGA Zone 51

- Regional study area
- S10
- W18
- No access
- W17

**Figure 5-11.1**  
**Vegetation types in the regional study area**





**St Ives Gold Mine**

Project No	1128
Date	01-Mar-17
Drawn by	KW
Map author	KC

0 0.25 0.5 1 1.5 2  
Kilometres

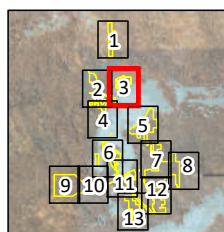
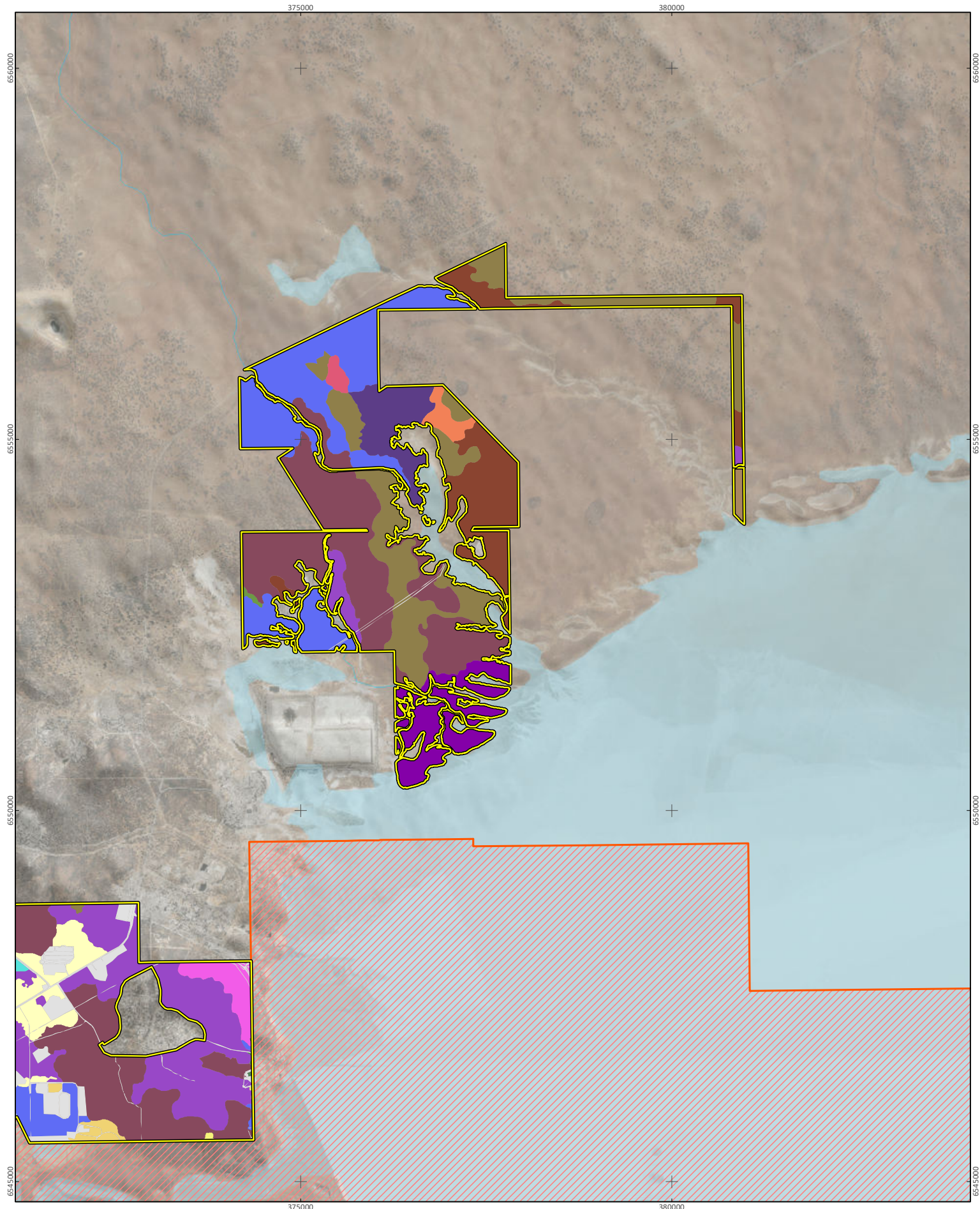
1:65,000 (at A4) GDA 1994 MGA Zone 51

- Regional study area
- B2018 study area
- Salt lake playa
- Disturbed/developed
- C2
- S2
- S8
- W4
- W9
- W11
- W16
- W17
- W19
- W21
- W22

**Figure 5-11.2**  
**Vegetation types in the regional study area**







#### St Ives Gold Mine

Project No 1128  
Date 01-Mar-17  
Drawn by KW  
Map author KC



0 0.25 0.5 1 1.5 2  
Kilometres

1:65,000 (at A4) GDA 1994 MGA Zone 51

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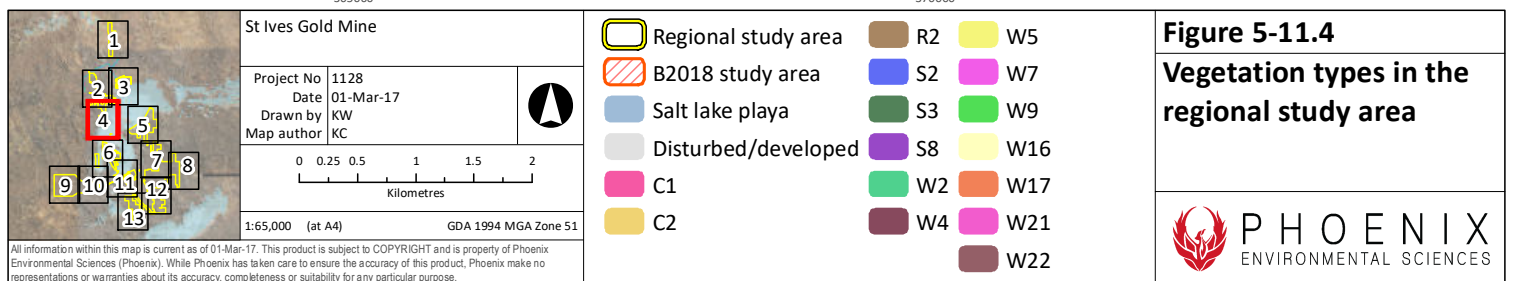
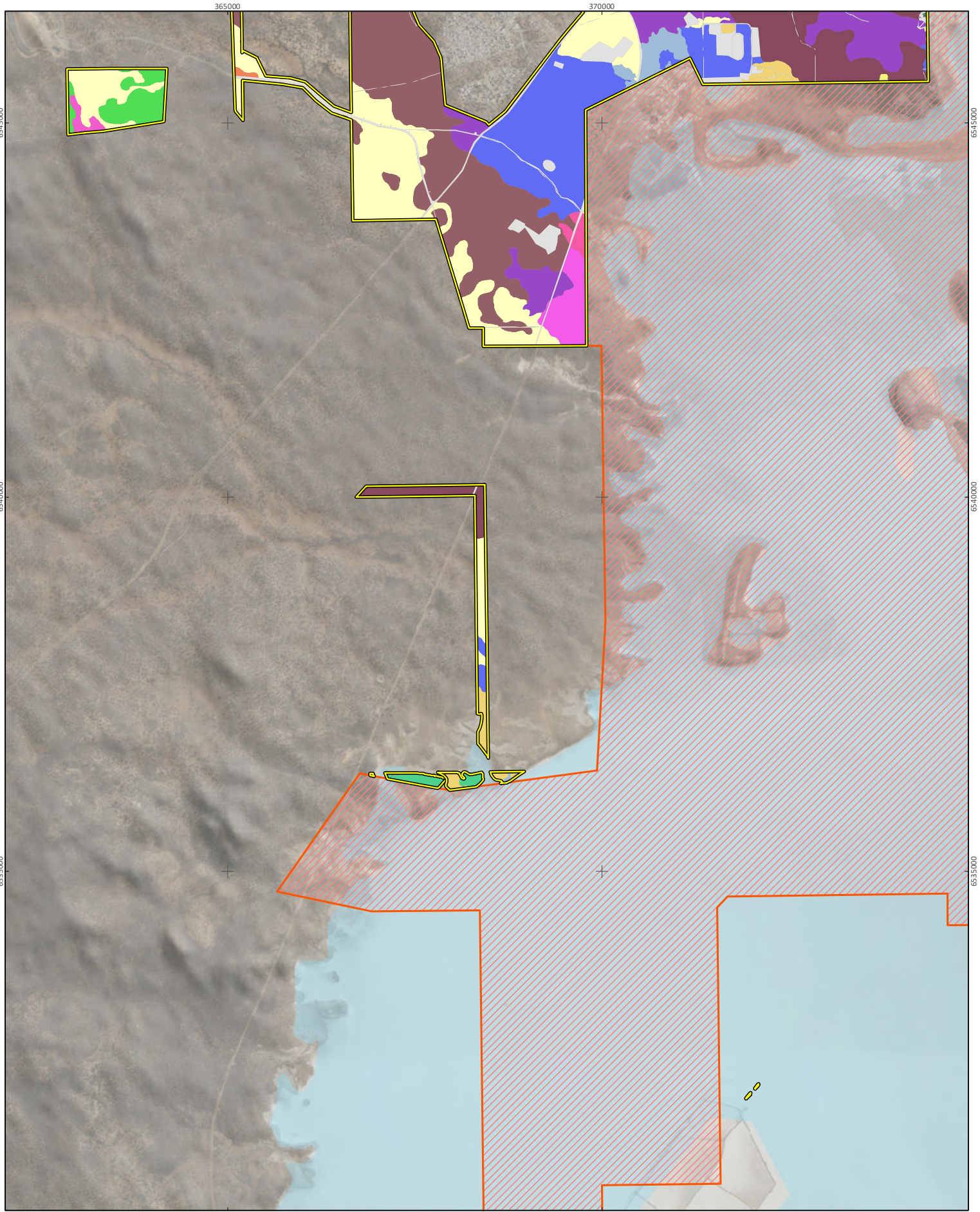
Regional study area	S2	W10
B2018 study area	S3	W11
Salt lake playa	S8	W16
Disturbed/developed	S2/S3/C3	W17
C2	W4	W19
C3	W5	W20
R2	W7	W23

#### Figure 5-11.3

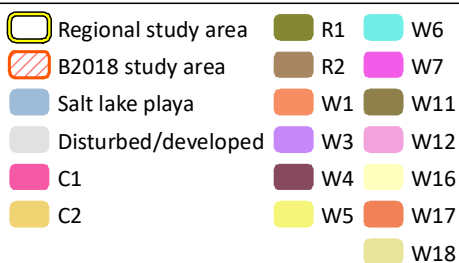
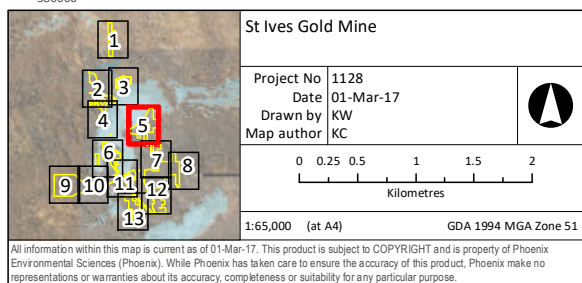
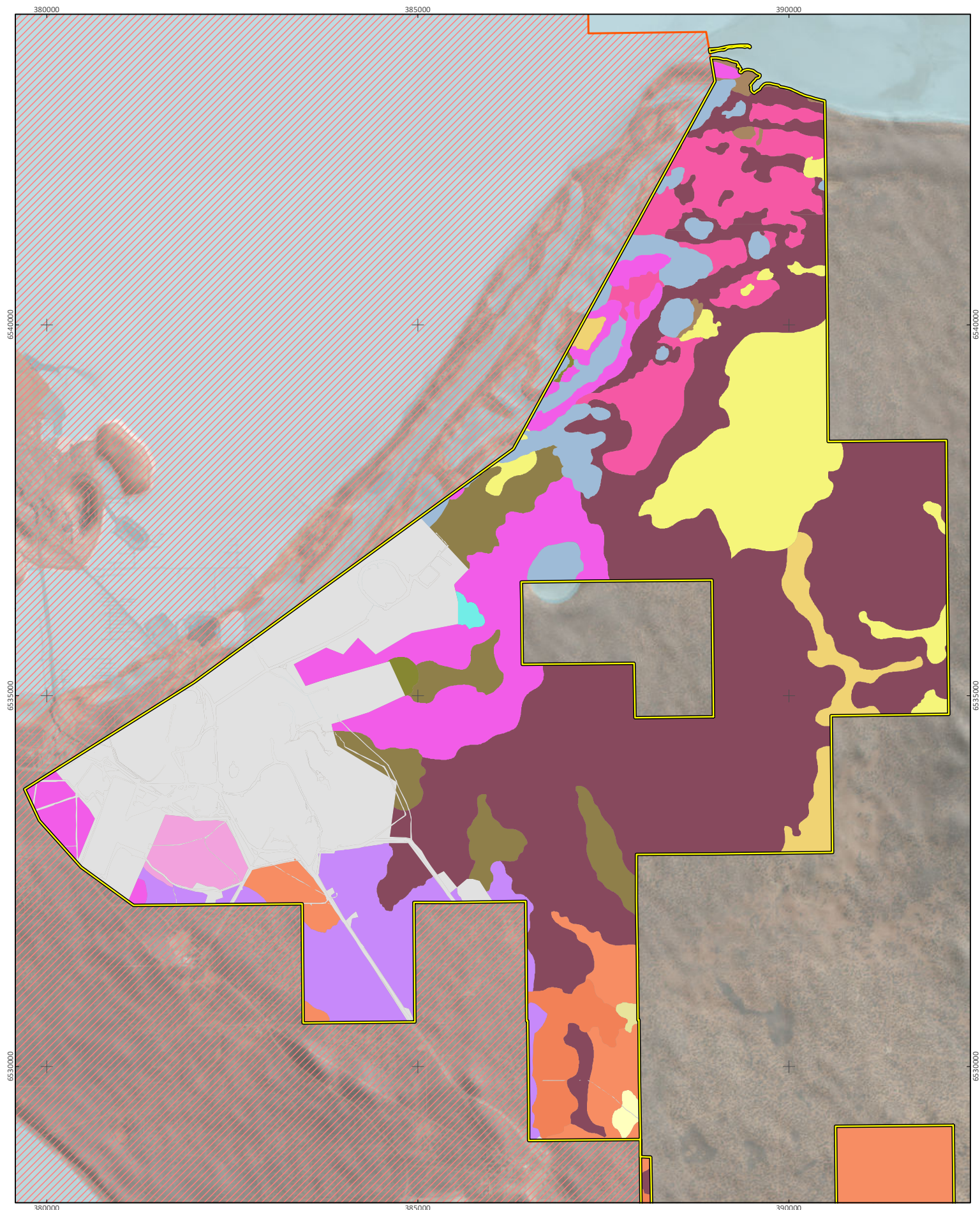
#### Vegetation types in the regional study area





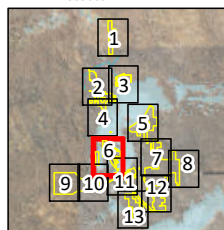
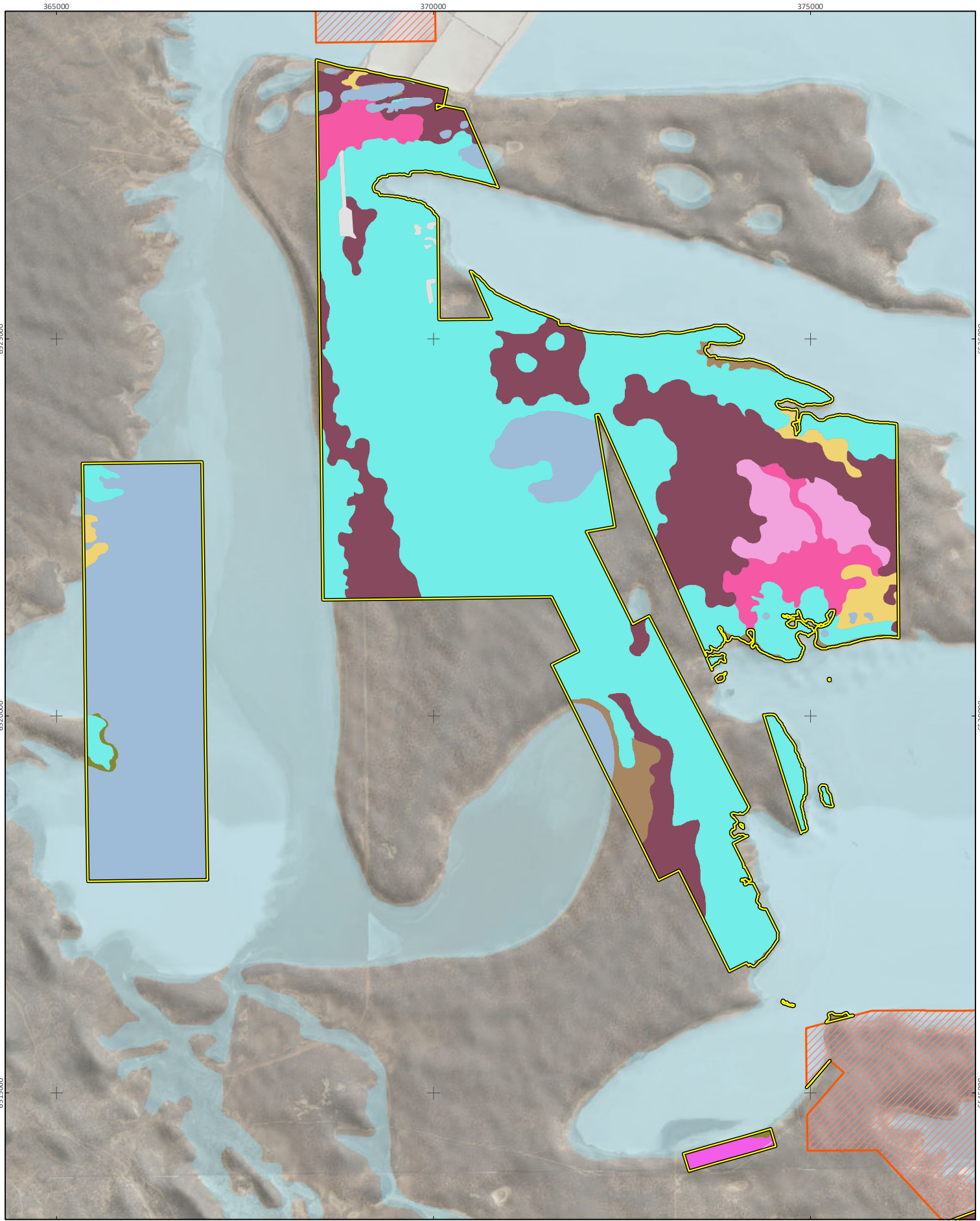






**Figure 5-11.5**  
**Vegetation types in the regional study area**





#### St Ives Gold Mine

Project No 1128  
 Date 01-Mar-17  
 Drawn by KW  
 Map author KC



0 0.25 0.5 1 1.5 2  
 Kilometres

1:65,000 (at A4) GDA 1994 MGA Zone 51

- Regional study area
- B2018 study area
- Salt lake playa
- Disturbed/developed
- C1
- C2
- R1
- R2
- W4
- W6
- W7
- W12

#### Figure 5-11.6

#### Vegetation types in the regional study area

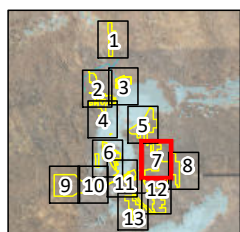
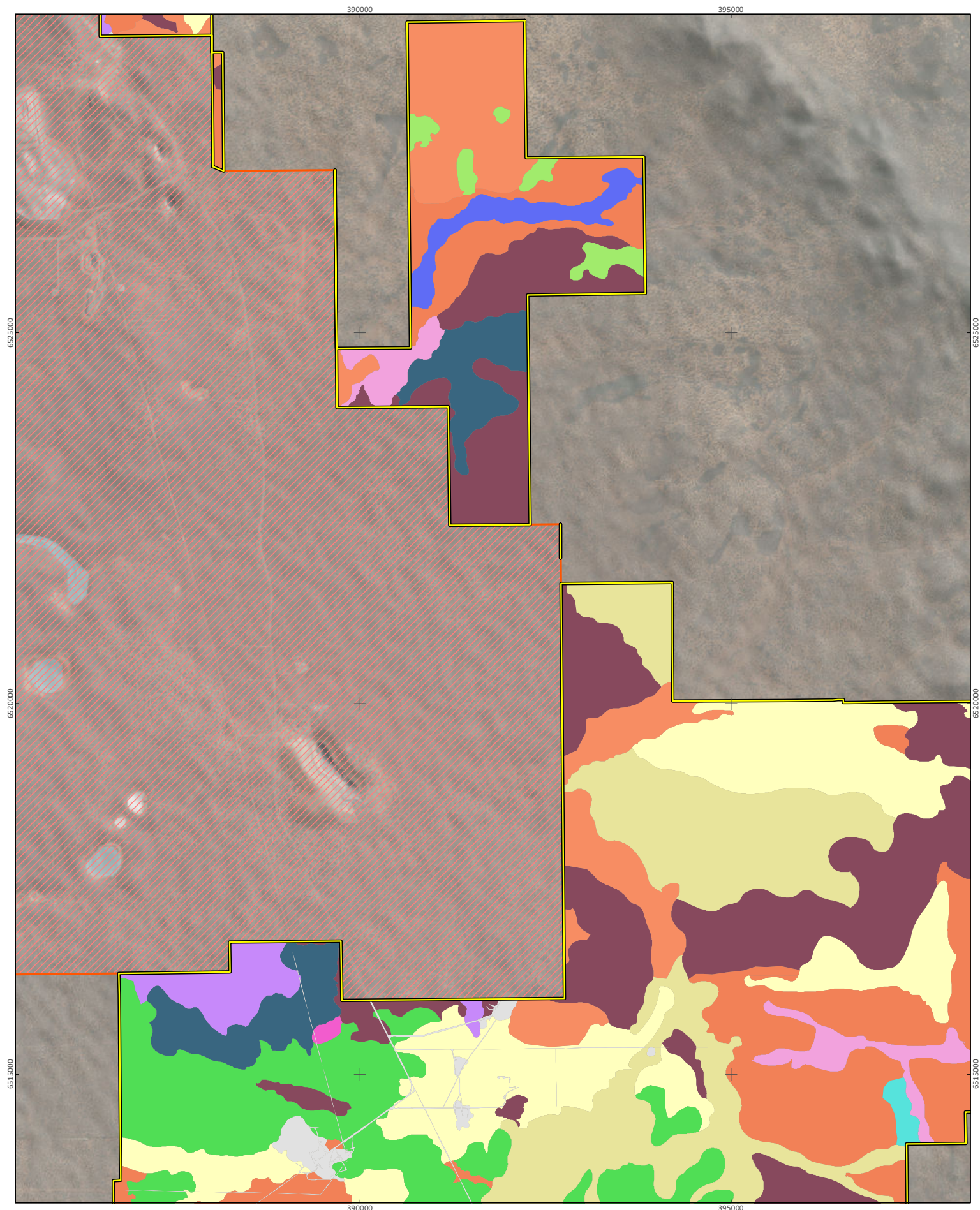


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**St Ives Gold Mine**

Project No	1128
Date	01-Mar-17
Drawn by	KW
Map author	KC

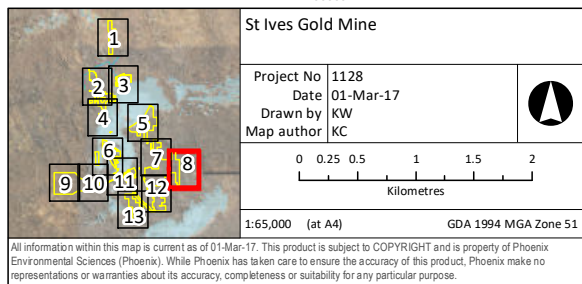
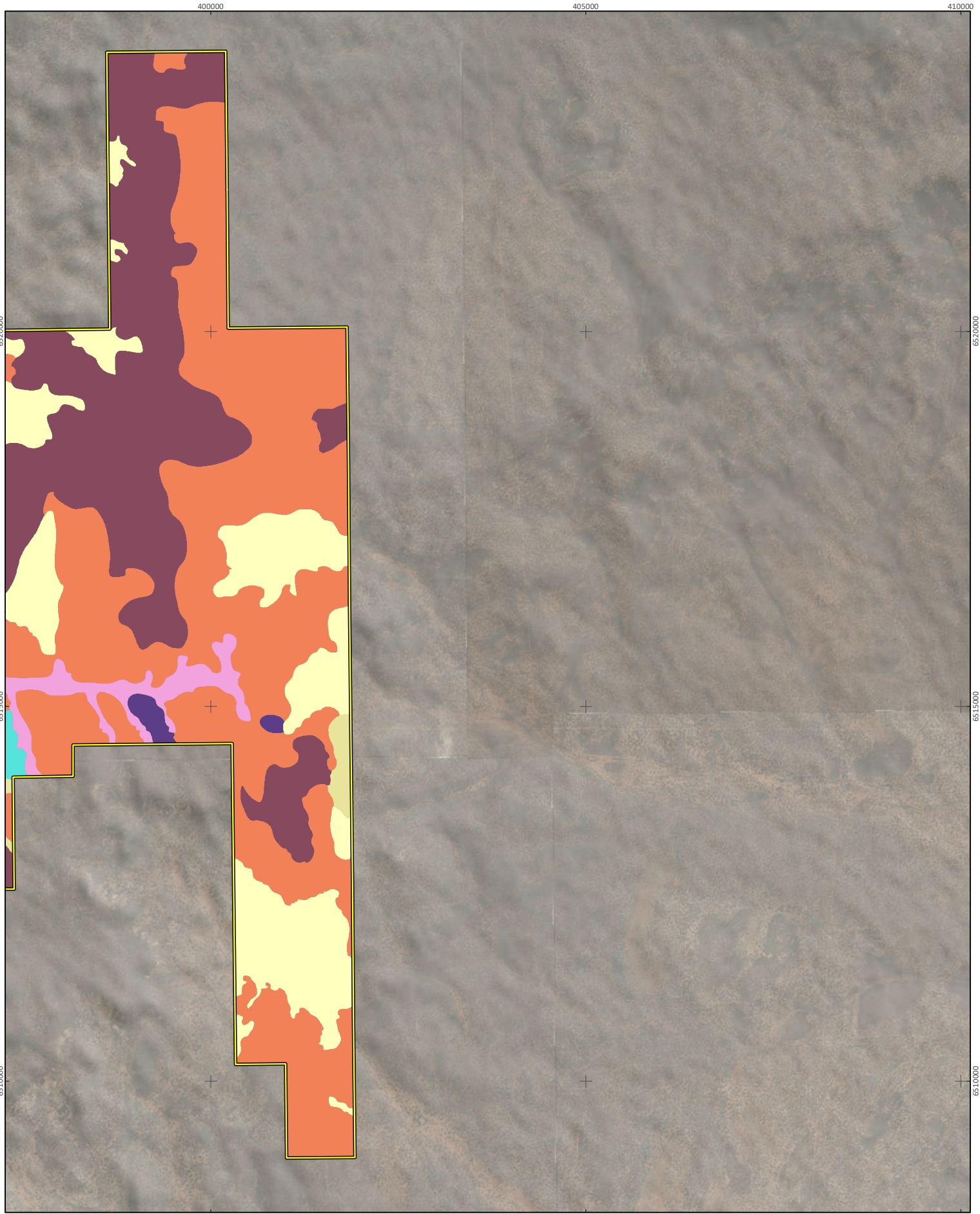
0 0.25 0.5 1 1.5 2  
Kilometres

1:65,000 (at A4) GDA 1994 MGA Zone 51

- |                     |     |     |
|---------------------|-----|-----|
| Regional study area | W3  | W16 |
| B2018 study area    | W4  | W17 |
| Disturbed/developed | W8  | W18 |
| S2                  | W9  | W19 |
| W1                  | W12 | W21 |
|                     | W24 |     |

**Figure 5-11.7**  
**Vegetation types in the regional study area**

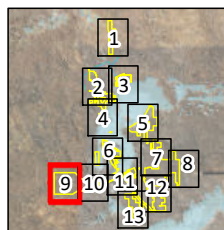
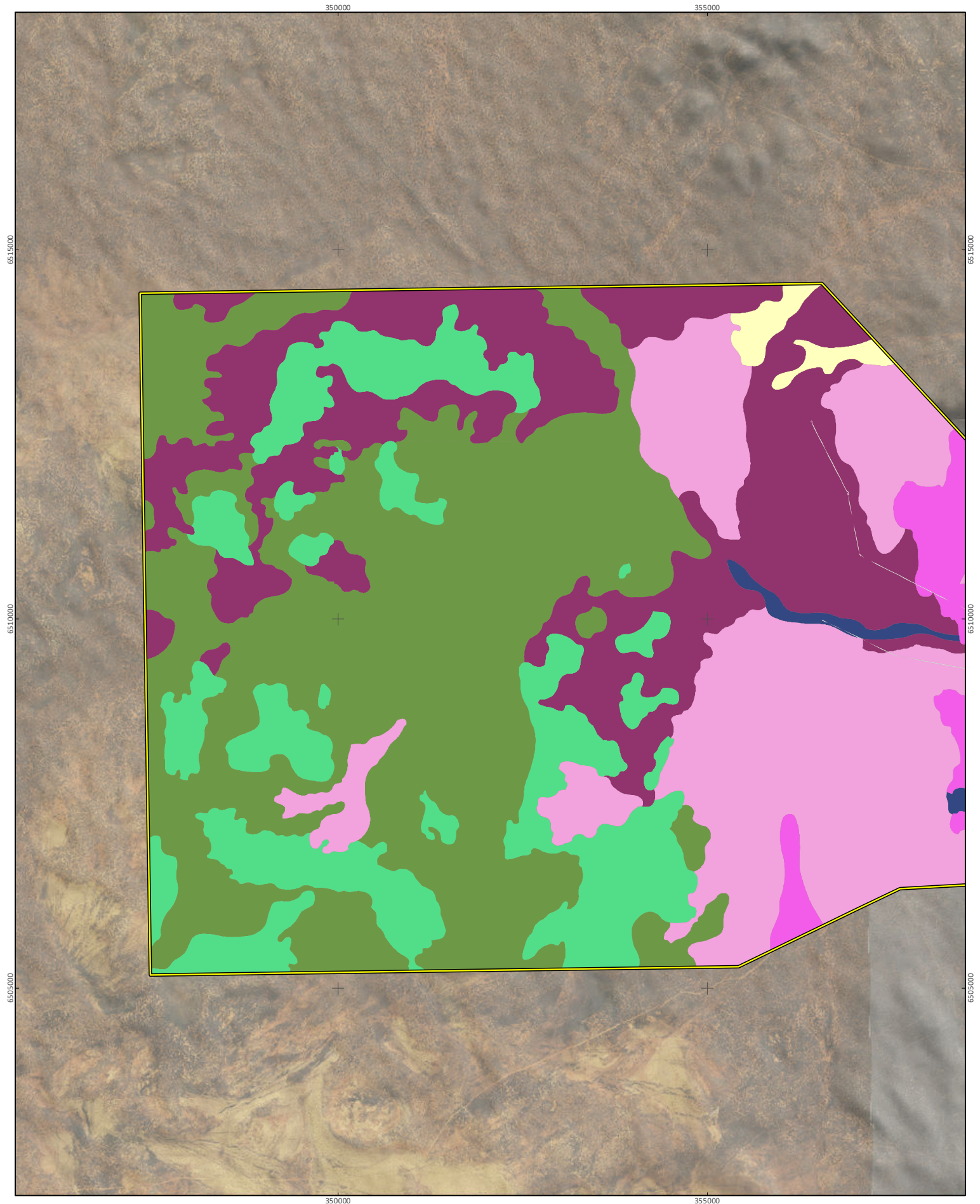




- Regional study area
- W4
- W10
- W12
- W16
- W18
- W17
- W19

**Figure 5-11.8**  
**Vegetation types in the regional study area**



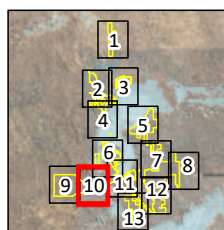
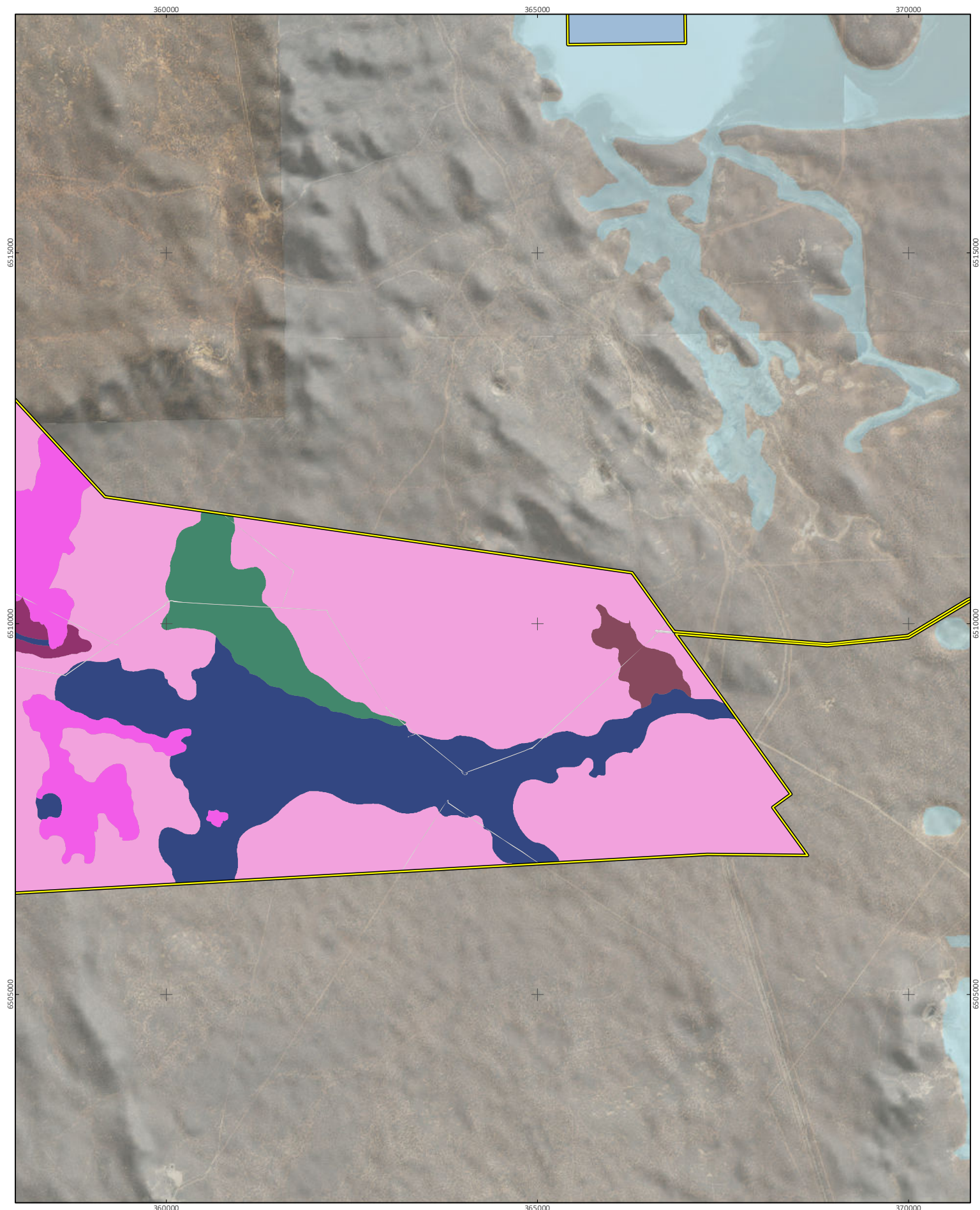


<b>St Ives Gold Mine</b>	
Project No	1128
Date	01-Mar-17
Drawn by	KW
Map author	KC
1:65,000 (at A4)	GDA 1994 MGA Zone 51

- |                     |     |     |
|---------------------|-----|-----|
| Regional study area | W7  | W15 |
| Disturbed/developed | W12 | W16 |
| S9                  | W13 | W20 |

**Figure 5-11.9**  
**Vegetation types in the regional study area**





#### St Ives Gold Mine

Project No 1128  
Date 01-Mar-17  
Drawn by KW  
Map author KC



0 0.25 0.5 1 1.5 2  
Kilometres

1:65,000 (at A4) GDA 1994 MGA Zone 51

- Regional study area
- Salt lake playa
- Disturbed/developed
- W4
- W7
- W12
- W13
- W14
- W15

#### Figure 5-11.10

**Vegetation types in the regional study area**

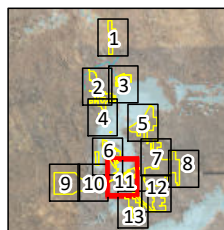
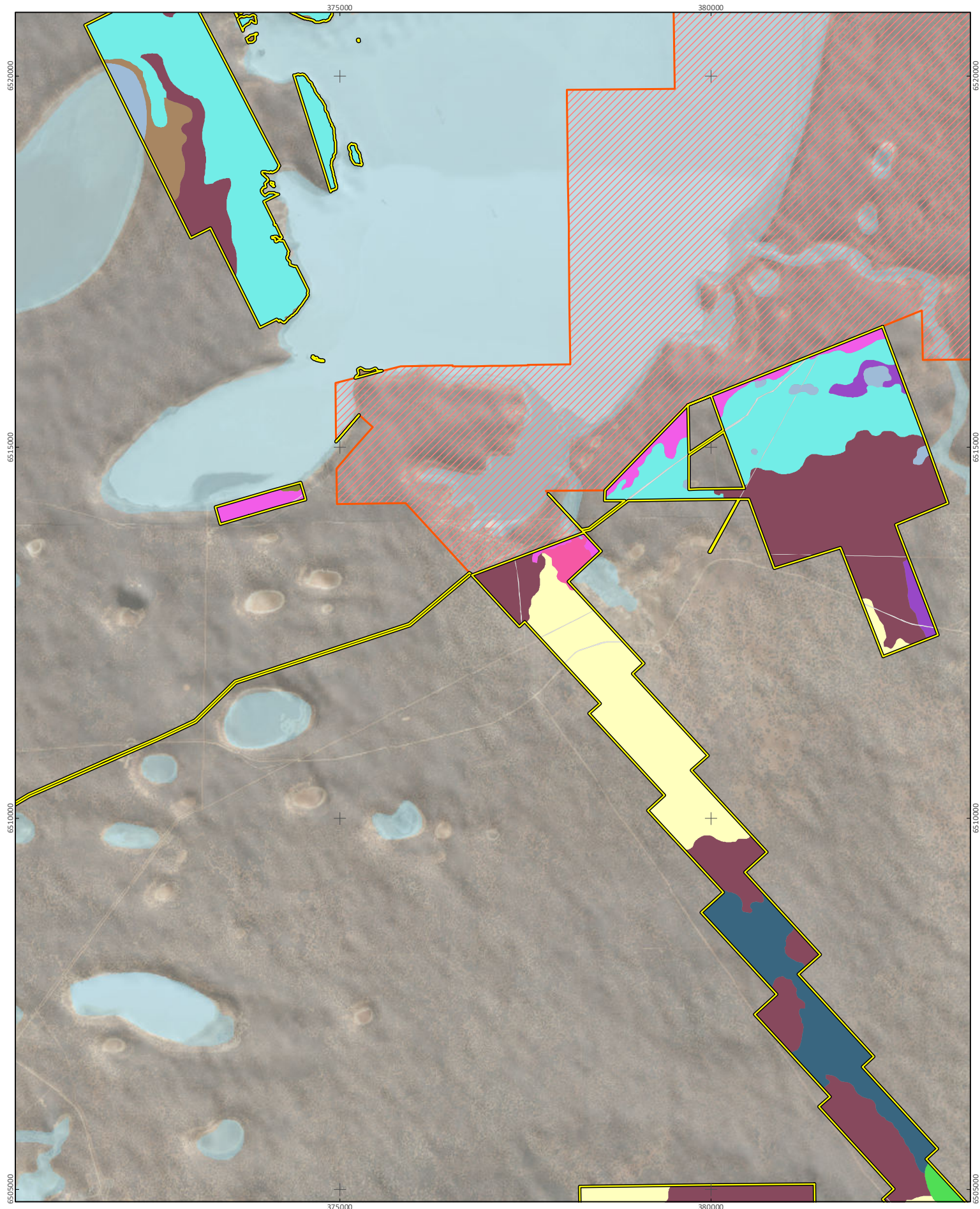


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#### St Ives Gold Mine

Project No 1128  
Date 01-Mar-17  
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Map author KC



0 0.25 0.5 1 1.5 2  
Kilometres

1:65,000 (at A4) GDA 1994 MGA Zone 51

- Regional study area
- B2018 study area
- Salt lake playa
- Disturbed/developed
- C1
- R1
- R2
- S8
- W4
- W6
- W7
- W8
- W9
- W16

**Figure 5-11.11**

**Vegetation types in the regional study area**

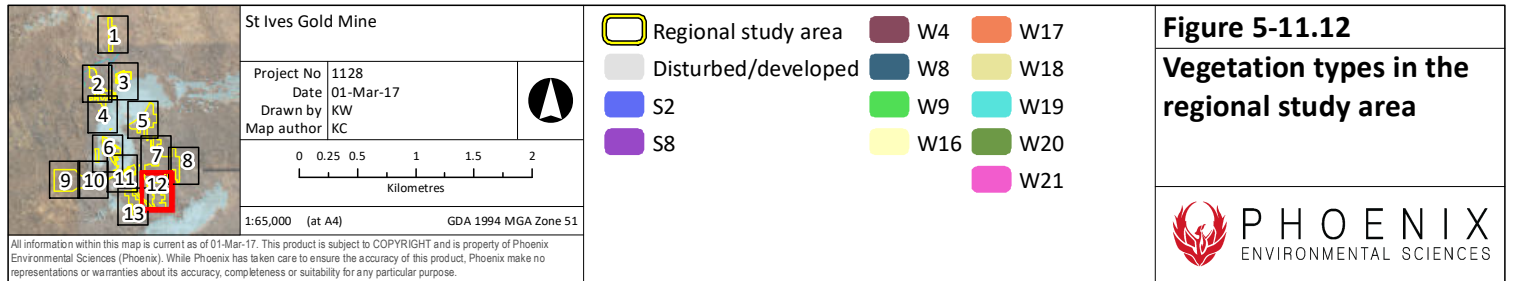
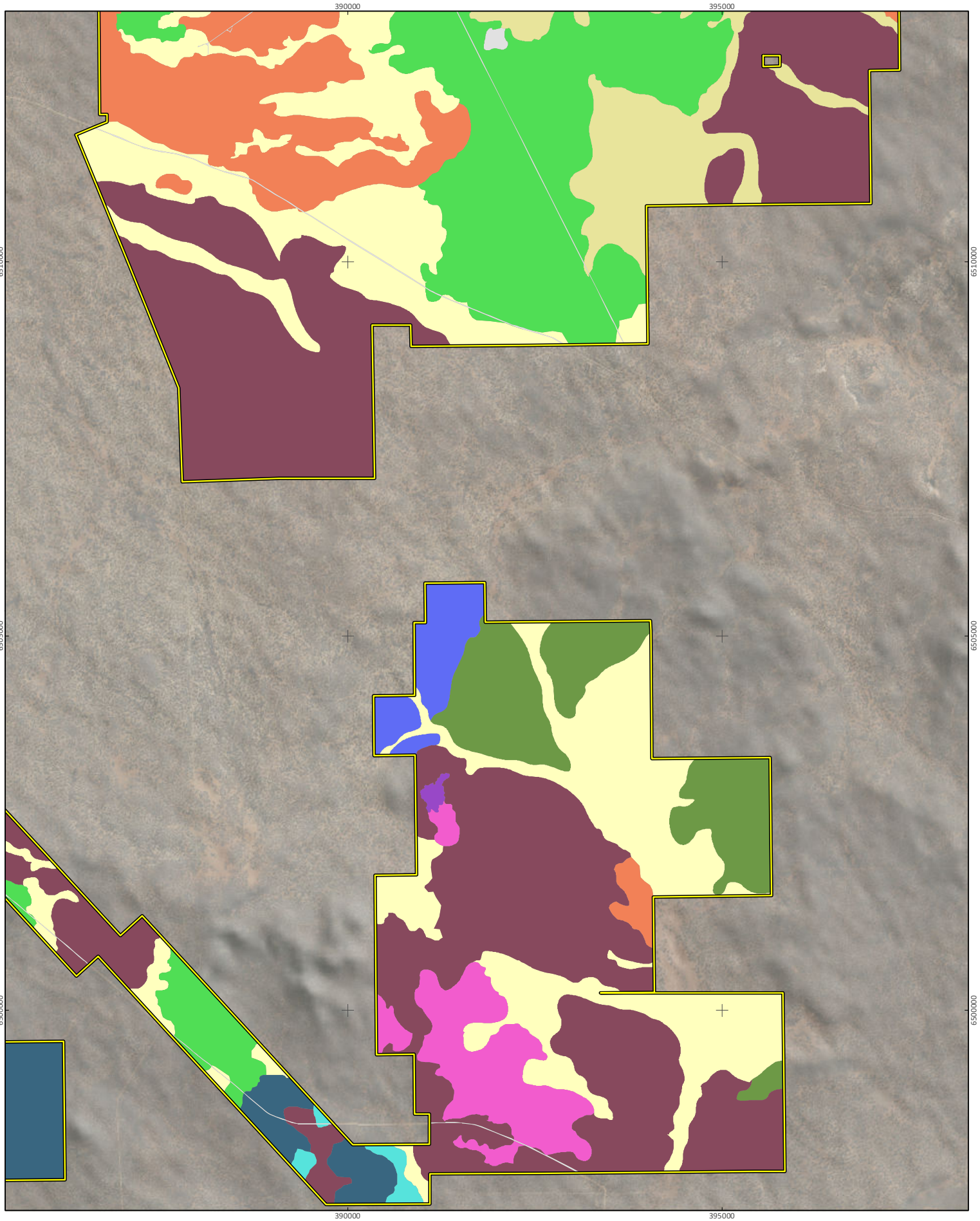


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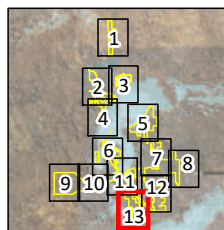
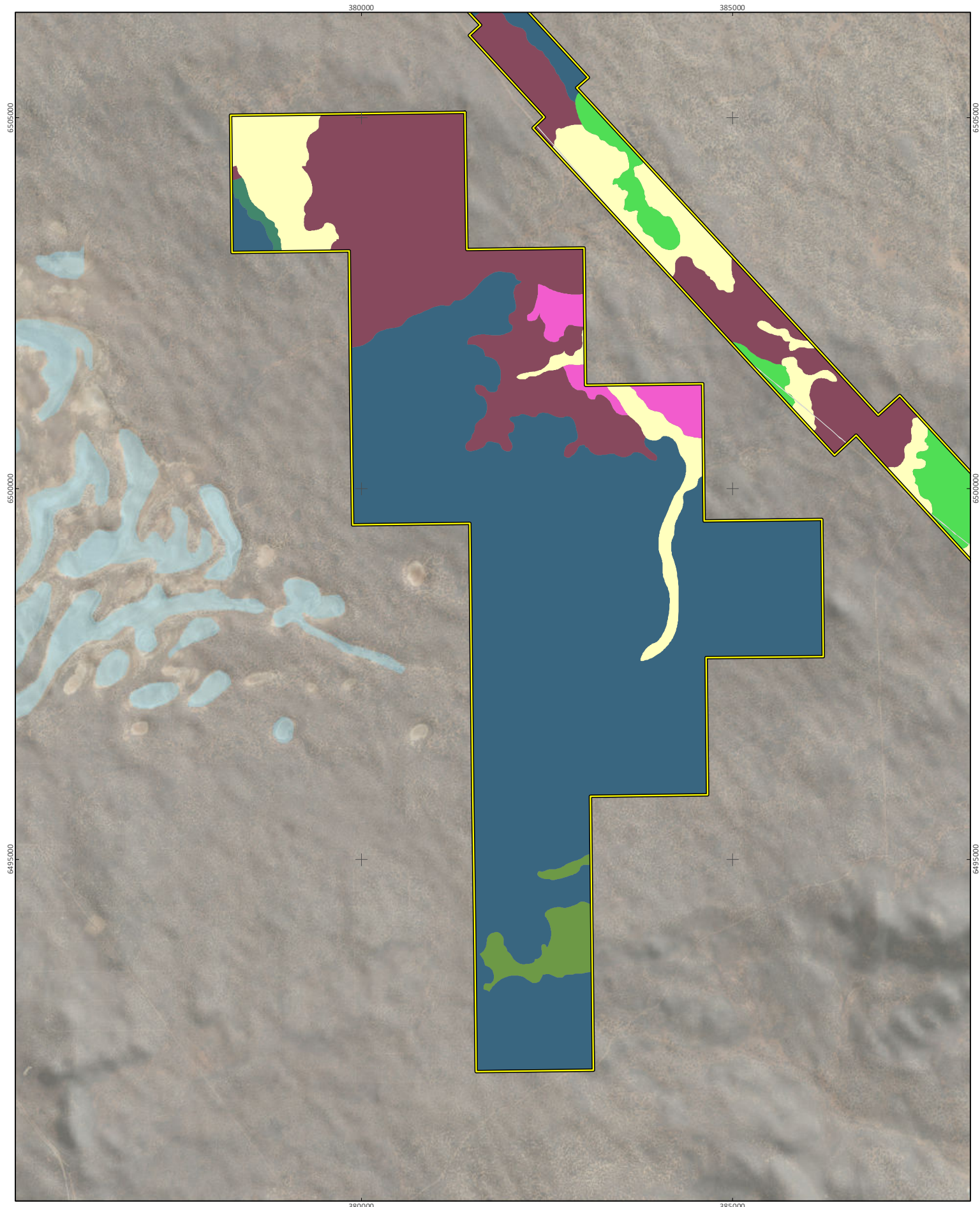
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#### St Ives Gold Mine

Project No 1128  
Date 01-Mar-17  
Drawn by KW  
Map author KC



0 0.25 0.5 1 1.5 2  
Kilometres

1:65,000 (at A4) GDA 1994 MGA Zone 51

- Regional study area
- Disturbed/developed
- W8
- W9
- W14
- W16
- W20
- W21
- W4

#### Figure 5-11.13

**Vegetation types in the regional study area**



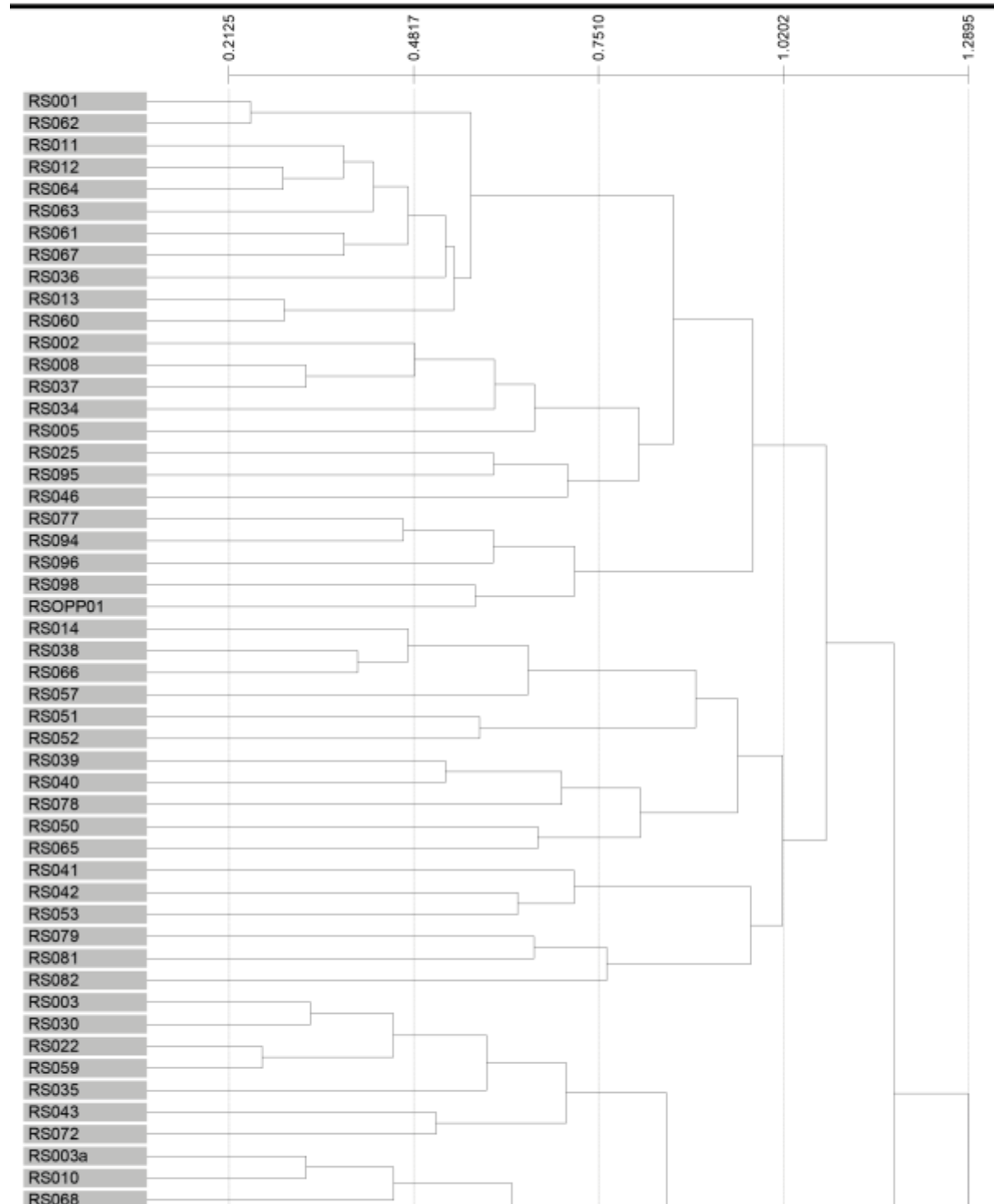
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Table3  
Fusion Type: Flexible UPGMA Beta = -0.10  
On Association: Kulczynski Columns Created on: 10:04:52, January 09, 2017

### Column Fusion Dendrogram



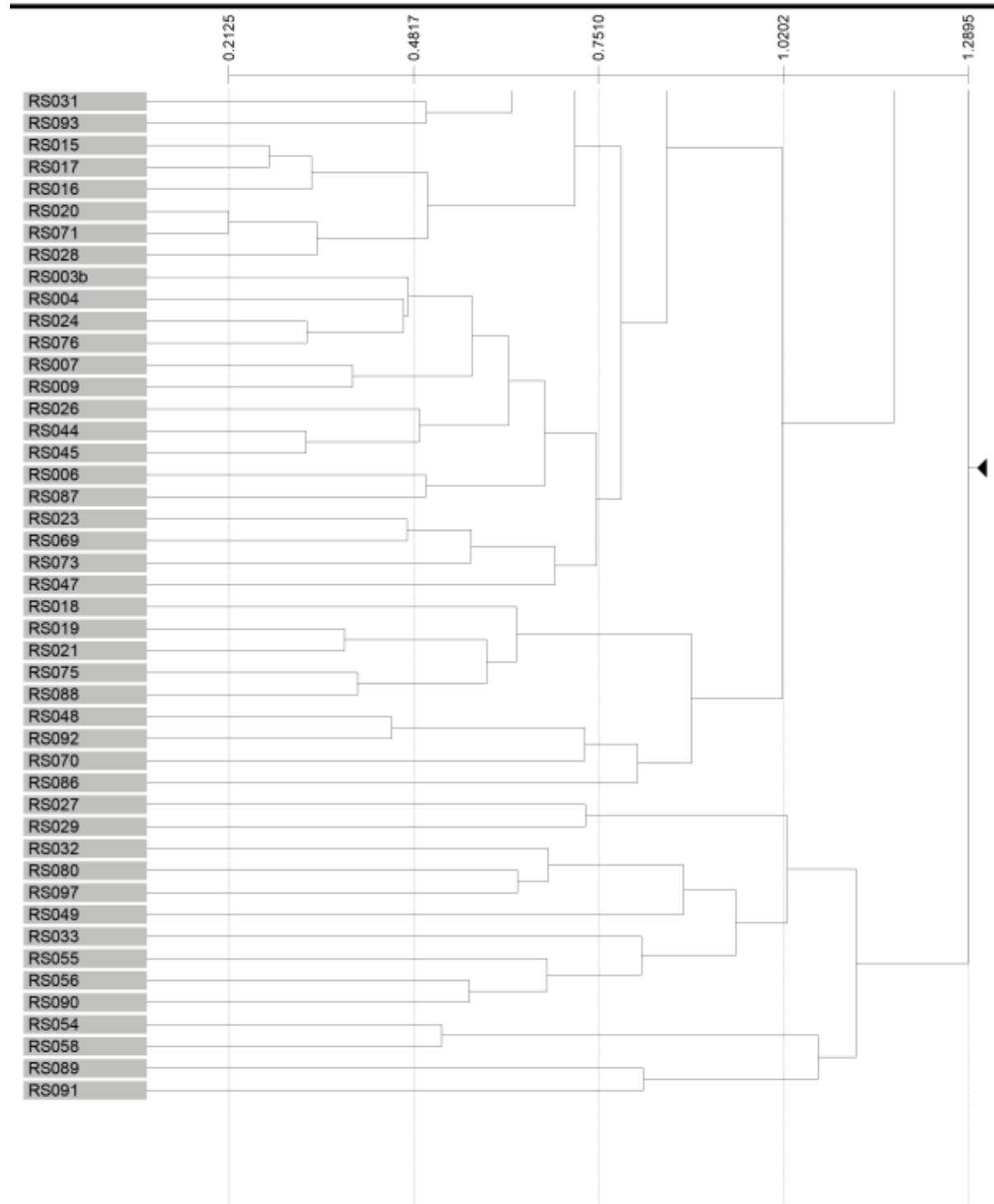
Page 1 of 2

**Figure 5-12.1 Hierarchical clustering (UPGMA) of the flora relevés of the regional study area**



Table3  
Fusion Type: Flexible UPGMA Beta = -0.10  
On Association: Kulczynski Columns Created on: 10:04:52, January 09, 2017

### Column Fusion Dendrogram



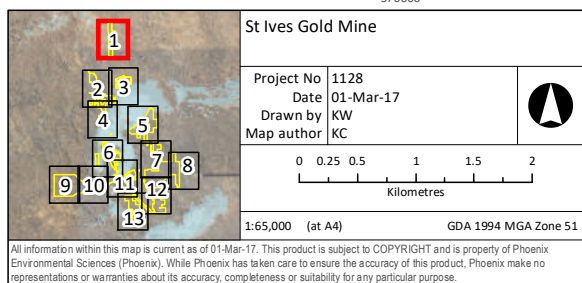
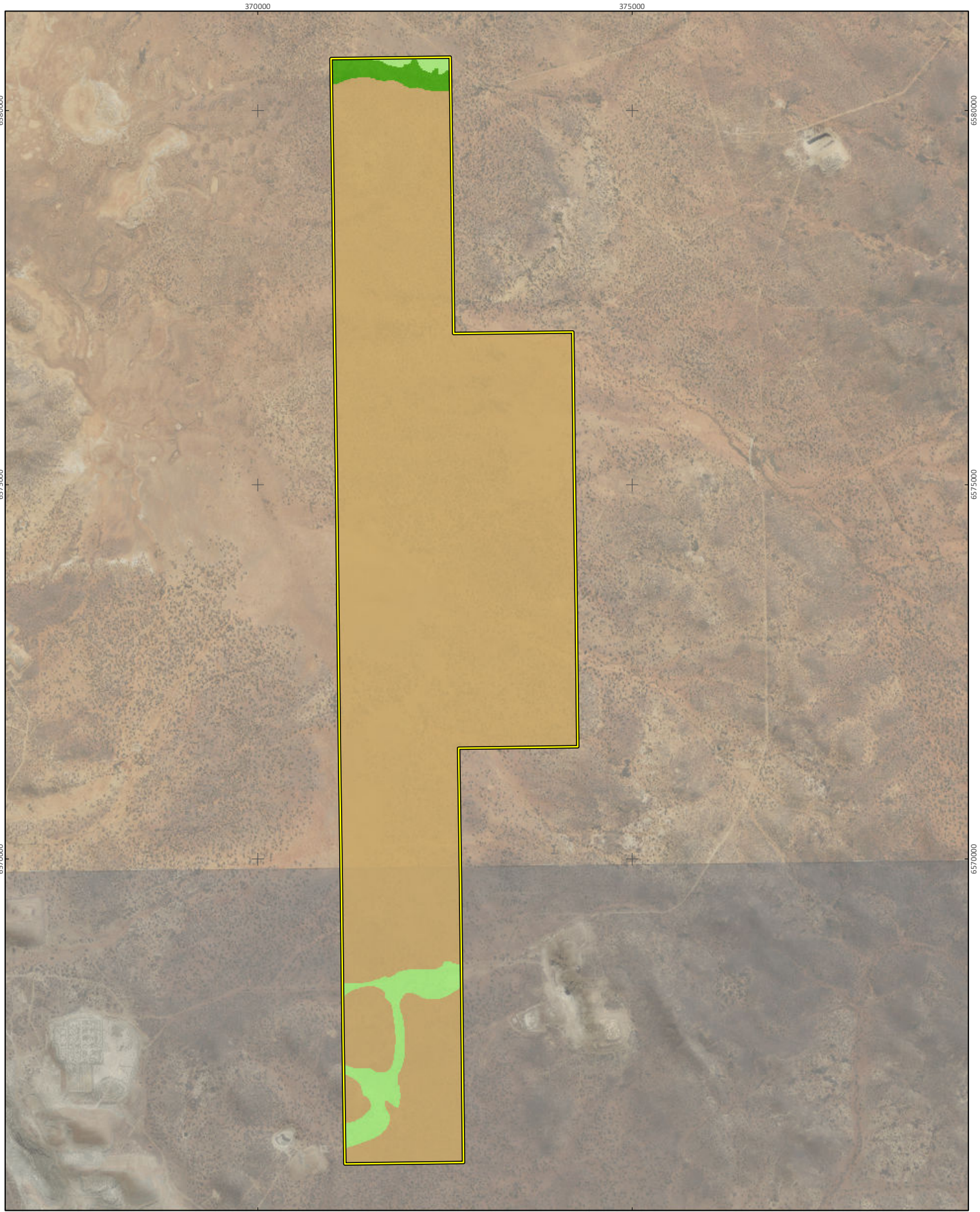
**Figure 5-12.2 Hierarchical clustering (UPGMA) of the flora relevés of the regional study area**

### 5.2.2.2 Vegetation condition

The condition of vegetation across the regional study area ranged from Completely Degraded to Pristine, with the majority of the regional study area mapped as Pristine (Figure 5-13; Table 5-11). Tracks, roads and disturbed areas were mapped as Completely Degraded. In general, vegetated areas were in Excellent to Pristine condition with a small proportion in Very Good or Good condition. A very low coverage of introduced flora mainly occurred adjacent to tracks. Occasionally evidence of domestic stock (cow paddys) and feral animals (rabbits) were observed, resulting in a lower rating (Good – Excellent).

**Table 5-11 Vegetation condition in the regional study area**

Condition (Keighery 1994)	Area (ha)	Percentage (%) of regional study area
Pristine	42,235.9	70.13
Excellent	11,176.7	18.56
Very Good	497.5	0.58
Good	497.5	0.83
Degraded	0	0
Completely Degraded	1,549.3	2.57
Unvegetated salt lake playa	1,334.5	2.22
Undetermined (inaccessible areas)	3,077.8	5.11
<b>Total:</b>	<b>60,223.9</b>	<b>100.00</b>

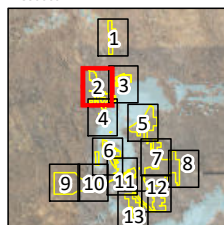
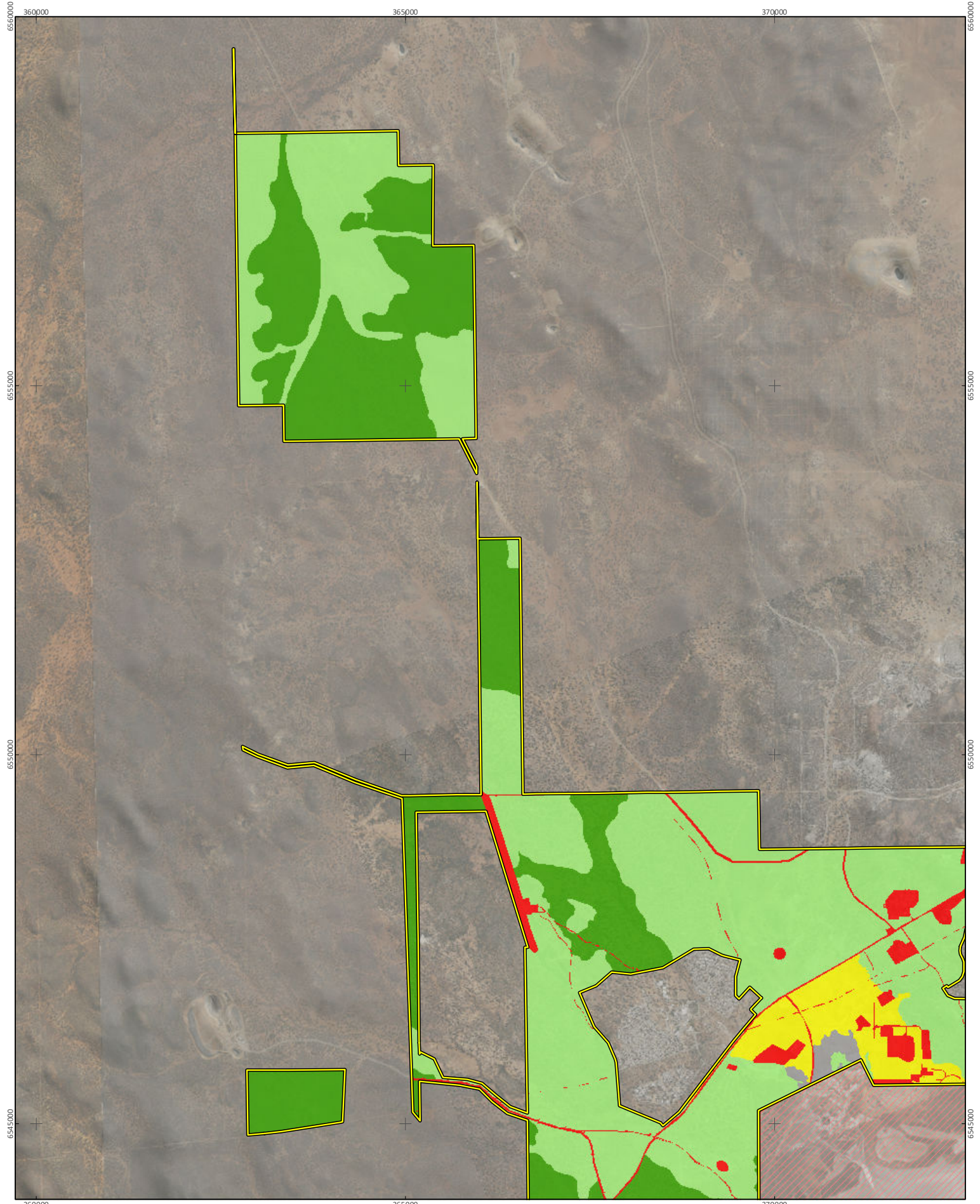


Regional study area
 Pristine
 Excellent
 Undetermined

**Figure 5-13.1**

**Vegetation condition in the regional study area**





**St Ives Gold Mine**

Project No	1128
Date	01-Mar-17
Drawn by	KW
Map author	KC


0 0.25 0.5 1 1.5 2  
Kilometres

1:65,000 (at A4) GDA 1994 MGA Zone 51

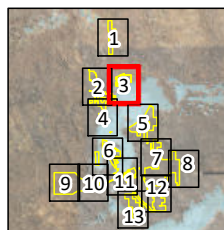
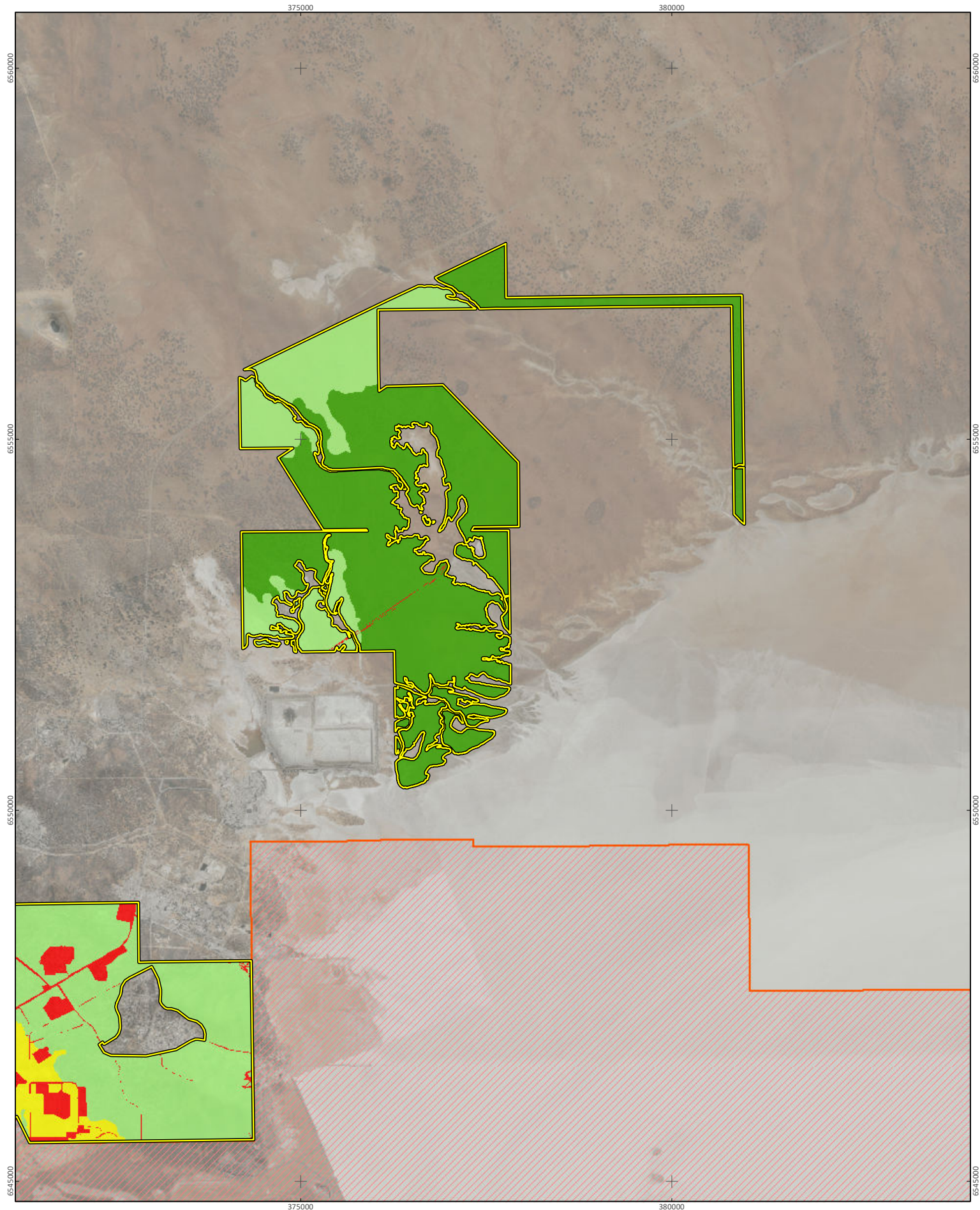
- Regional study area
- B2018 study area
- Pristine
- Excellent
- Very Good
- Completely Degraded
- Unvegetated

**Figure 5-13.2**

**Vegetation condition in the regional study area**


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#### St Ives Gold Mine

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Date 01-Mar-17  
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Map author KC



0 0.25 0.5 1 1.5 2  
Kilometres

1:65,000 (at A4) GDA 1994 MGA Zone 51

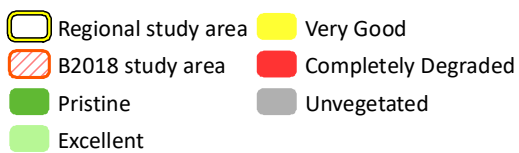
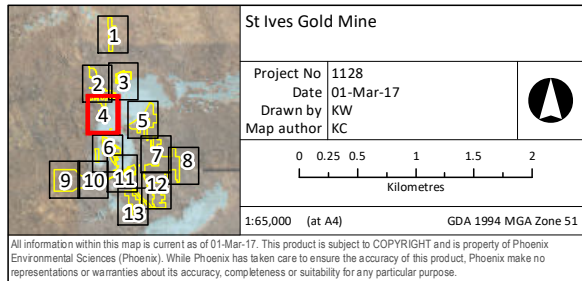
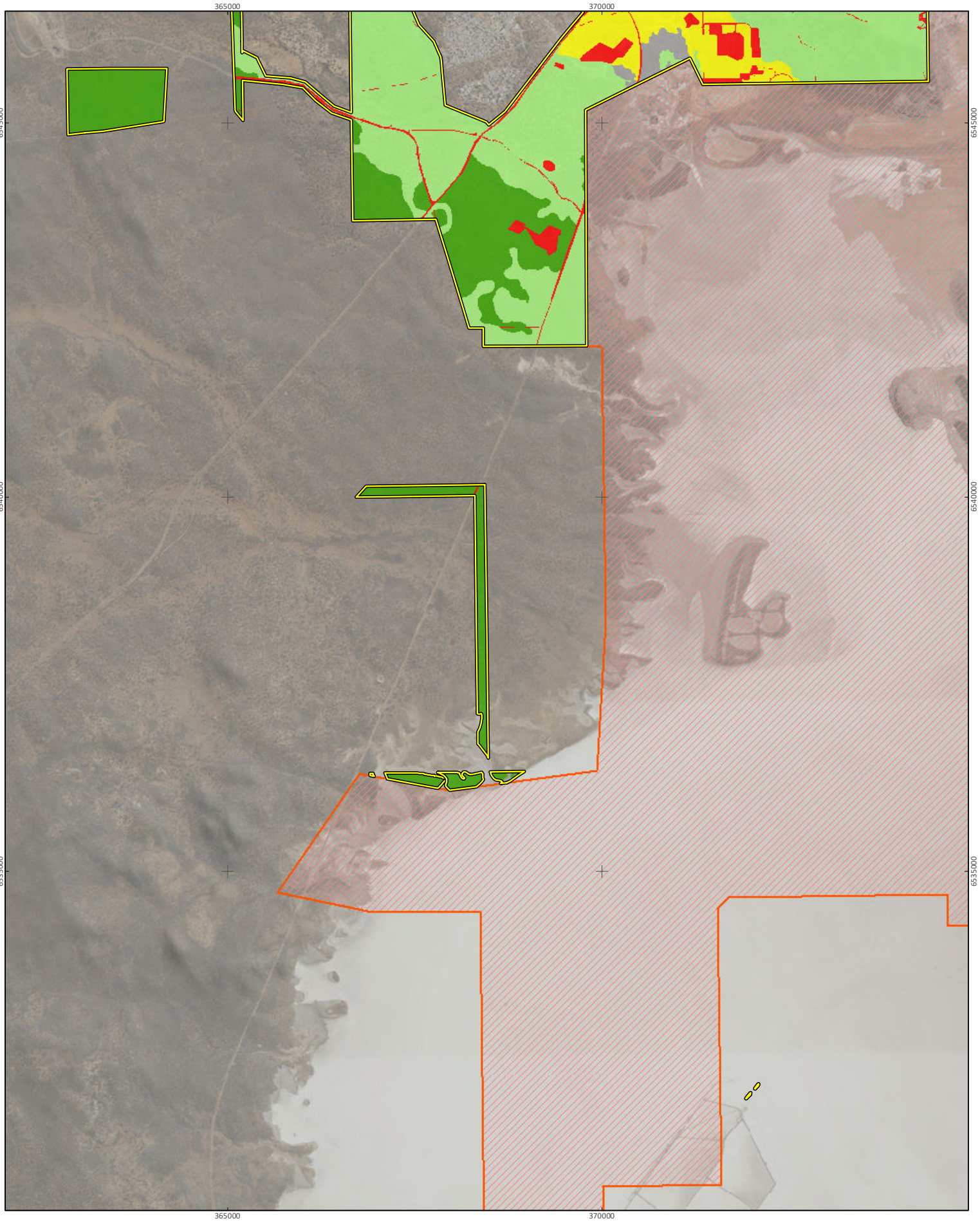
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- Regional study area
- B2018 study area
- Pristine
- Excellent
- Very Good
- Completely Degraded
- Unvegetated

**Figure 5-13.3**

**Vegetation condition in the regional study area**

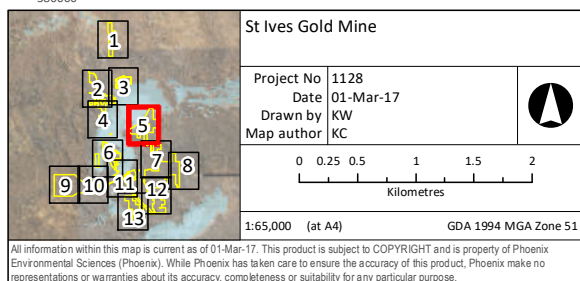
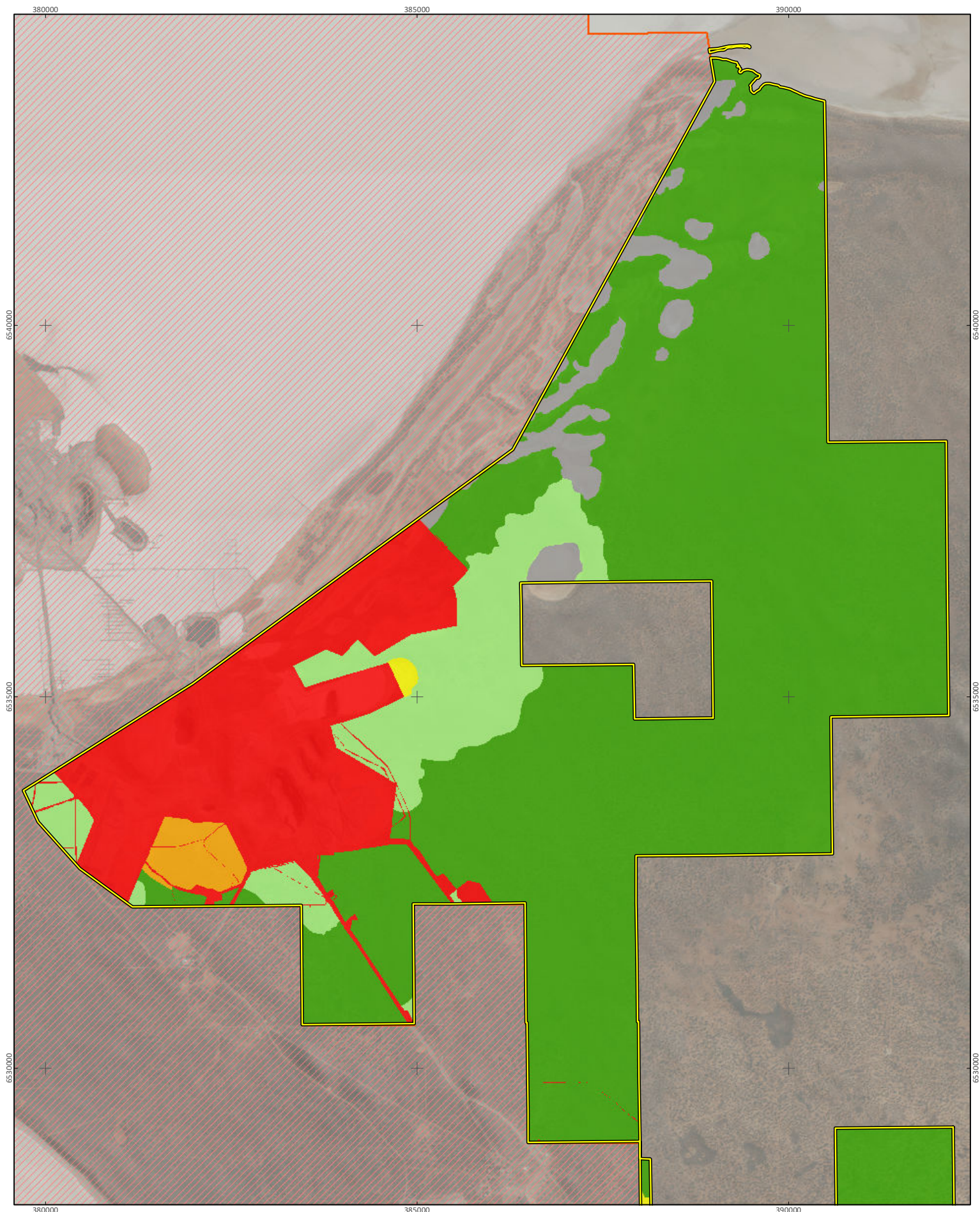




**Figure 5-13.4**

**Vegetation condition in the regional study area**

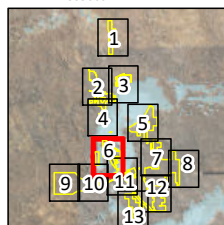
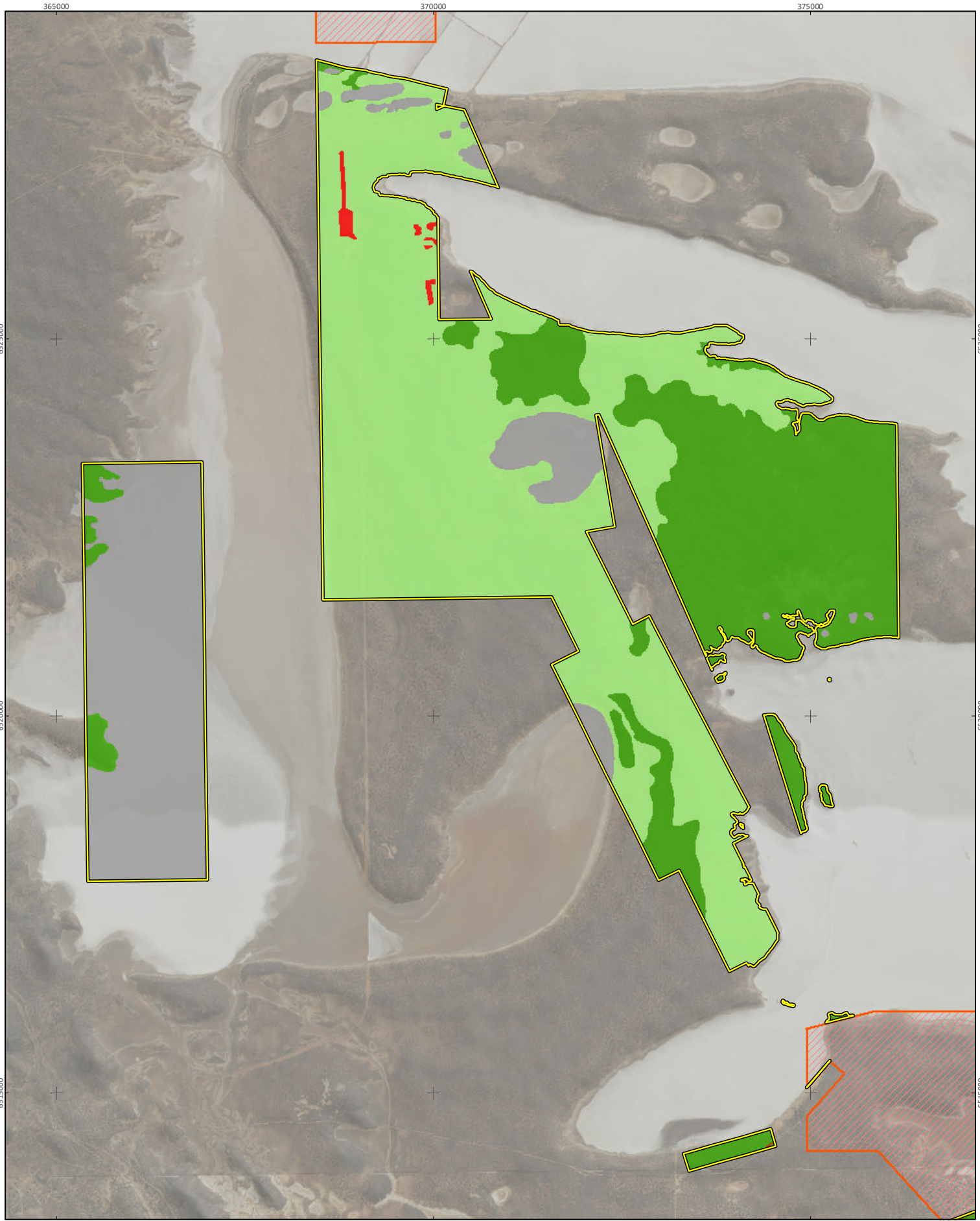




**Figure 5-13.5**

**Vegetation condition in the regional study area**





# St Ives Gold Mine

Project No	1128
Date	01-Mar-17
Drawn by	KW
Map author	KC



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- Regional study area
- B2018 study area
- Excellent
- Pristine
- Completely Degraded
- Unvegetated

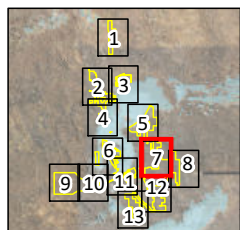
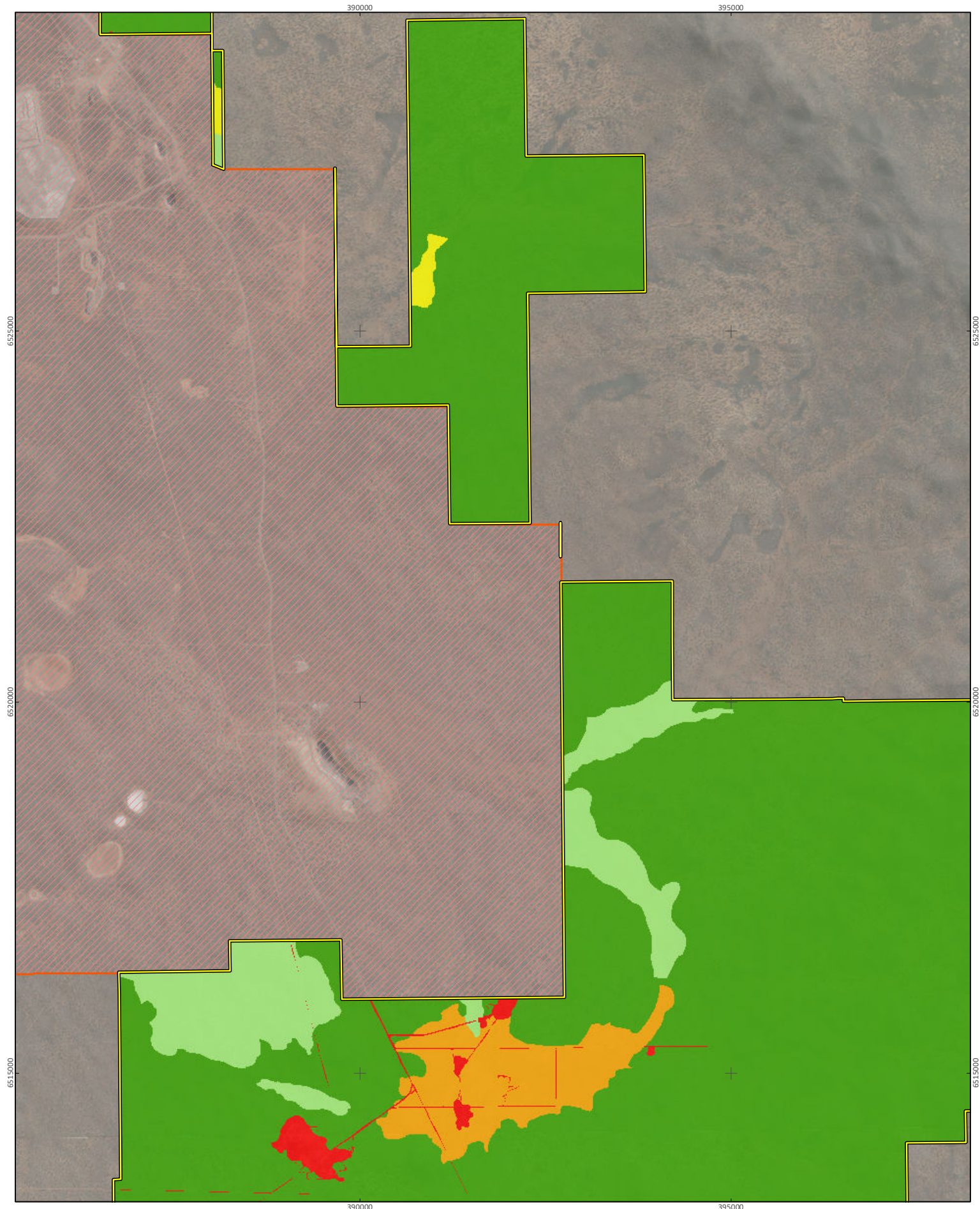
## Figure 5-13.6

### Vegetation condition in the regional study area



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#### St Ives Gold Mine

Project No 1128  
Date 01-Mar-17  
Drawn by KW  
Map author KC



0 0.25 0.5 1 1.5 2  
Kilometres

1:65,000 (at A4) GDA 1994 MGA Zone 51

- Regional study area
- B2018 study area
- Pristine
- Excellent
- Very Good
- Good
- Completely Degraded

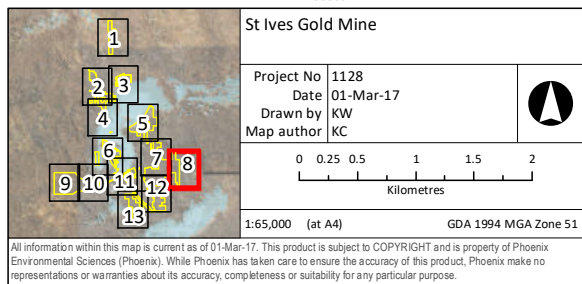
#### Figure 5-13.7

#### Vegetation condition in the regional study area



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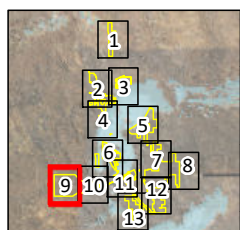



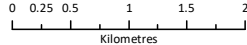


- Regional study area
- Very Good
- Pristine

**Figure 5-13.8**  
**Vegetation condition in the regional study area**





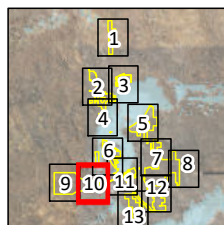
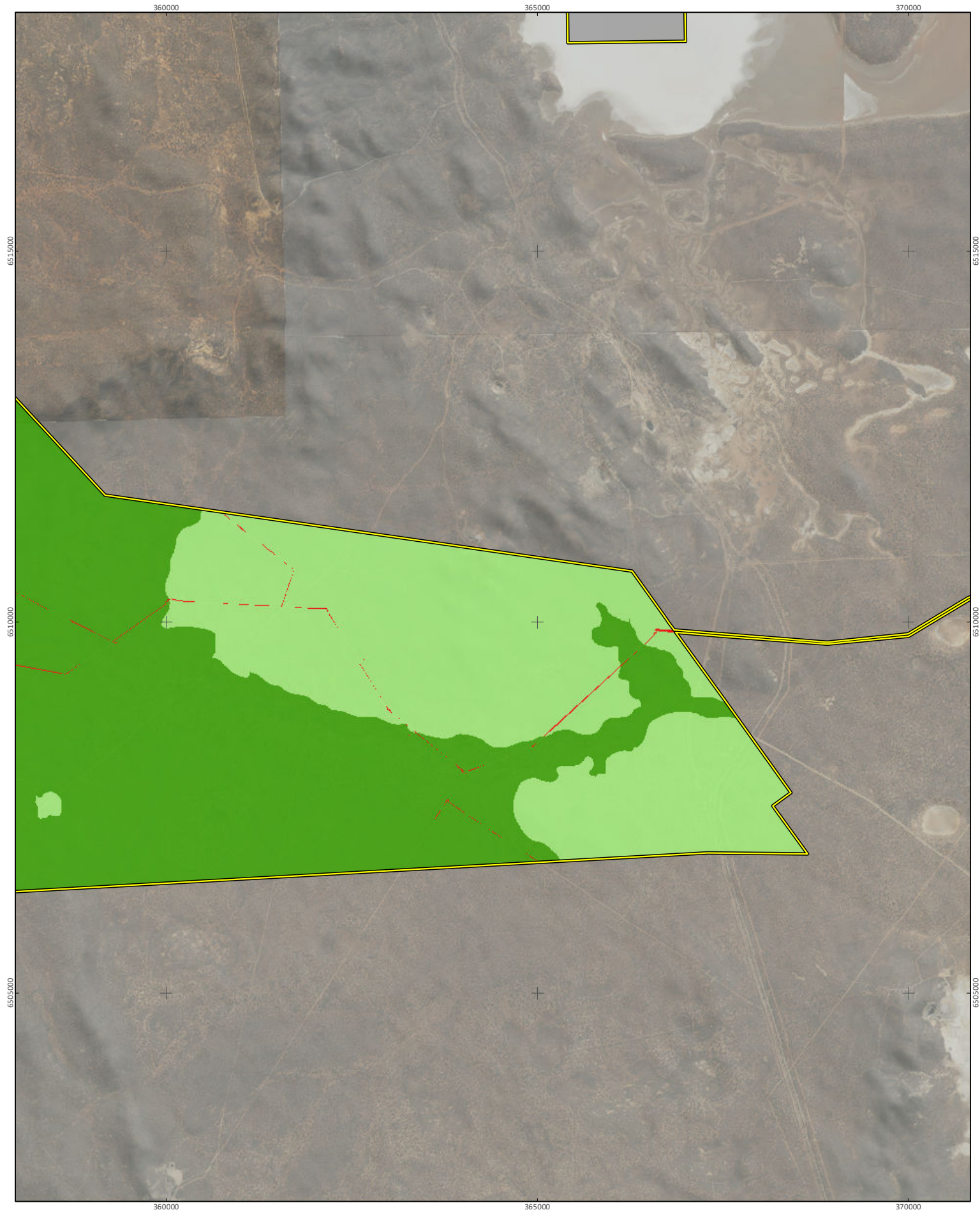
<b>St Ives Gold Mine</b>		
Project No	1128	
Date	01-Mar-17	
Drawn by	KW	
Map author	KC	
		
1:65,000 (at A4) GDA 1994 MGA Zone 51		

- |   |   |
|---|---|
|  Regional study area |  Excellent           |
|  Pristine            |  Completely Degraded |

**Figure 5-13.9**

**Vegetation condition in the regional study area**





<b>St Ives Gold Mine</b>		
Project No	1128	
Date	01-Mar-17	
Drawn by	KW	
Map author	KC	
1:65,000 (at A4) GDA 1994 MGA Zone 51		

Regional study area	Completely Degraded
Pristine	Unvegetated
Excellent	

**Figure 5-13.10**

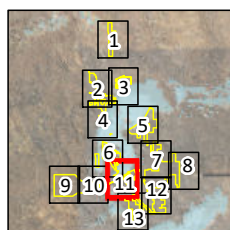
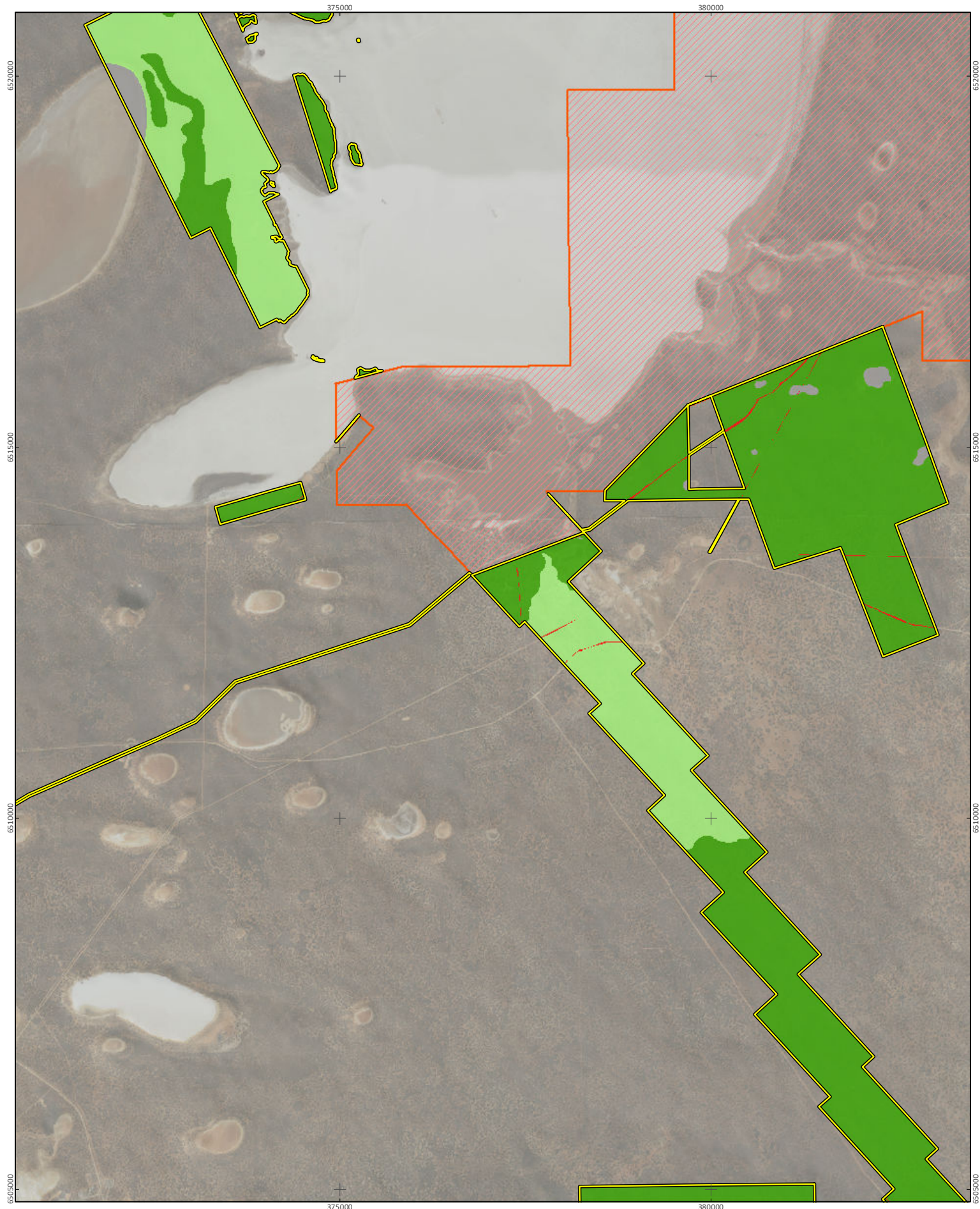
**Vegetation condition in the regional study area**

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#### St Ives Gold Mine

Project No 1128  
Date 01-Mar-17  
Drawn by KW  
Map author KC



0 0.25 0.5 1 1.5 2  
Kilometres

1:65,000 (at A4) GDA 1994 MGA Zone 51

- Regional study area
- B2018 study area
- Pristine
- Excellent
- Completely Degraded
- Unvegetated

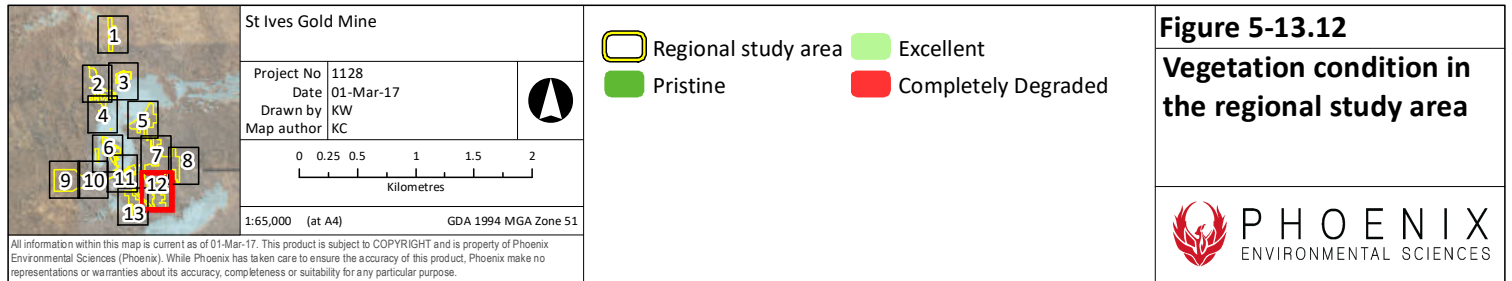
**Figure 5-13.11**

**Vegetation condition in the regional study area**



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### 5.2.2.3 Threatened and Priority Ecological Communities

No vegetation types were classified as either a TEC or PEC. The nearest PEC or TEC to the regional study area is the Priority 1 Fraser Range Vegetation Complex PEC. None of the vegetation types within the regional study area are floristically representative of this PEC.

### 5.2.2.4 Local and regional significance of vegetation

None of the vegetation types are considered regionally significant as they do not represent habitat for Federal or State listed Threatened flora or are representative of vegetation with less than 30% Pre-European extent remaining.

A total of 22 vegetation types (Table 5-12) recorded in the regional study area may be considered to have local conservation significance for one or more of the following reasons:

- represents habitat for Priority Flora<sup>4</sup>
- restricted distribution within regional study area
- restricted distribution across combined B2018 study area and regional study area.

**Table 5-12 Locally significant vegetation within the regional study area**

Vegetation type	Local significance criteria
C1	Represents habitat for <i>Tecticornia mellarium</i> P1
C2	Represents habitat for <i>Tecticornia mellarium</i> P1
C3	Represents habitat for <i>Calandrinia</i> sp. Widgiemooltha P1 Represents habitat for <i>Tecticornia mellarium</i> P1 Restricted distribution across combined B2018 study area and regional study area
R1	Represents habitat for <i>Tecticornia mellarium</i> P1 Represents habitat for <i>Pityrodia scabra</i> subsp. <i>dendrotricha</i> P3 Restricted distribution within regional study area
R2	Represents habitat for <i>Tecticornia mellarium</i> P1
S2	Represents habitat for <i>Calandrinia</i> sp. Widgiemooltha P1
S3	Restricted distribution within regional study area Restricted distribution across combined B2018 study area and regional study area
S8	Represents habitat for <i>Cyathostemon divaricatus</i> P1 Represents habitat for <i>Allocasuarina eriochlamys</i> subsp. <i>grossa</i> P3
W2	Restricted distribution within regional study area Restricted distribution across combined B2018 study area and regional study area
W4	Represents habitat for <i>Eremophila perglandulosa</i> P1
W7	Represents habitat for <i>Trachymene pyrophila</i> P2
W9	Represents habitat for <i>Eremophila praecox</i> P1
W10	Restricted distribution within regional study area

<sup>4</sup> Recorded either during the current survey, the B2018 study area survey or one of the previous regional surveys

Vegetation type	Local significance criteria
	Restricted distribution across combined B2018 study area and regional study area
W12	Represents habitat for <i>Diocirea acutifolia</i> P3 Represents habitat for <i>Prostanthera splendens</i> P1 Represents habitat for <i>Eremophila annosocaulis</i> P3
W13	Represents habitat for <i>Cryptandra crispula</i> P3 and <i>Pityrodia scabra</i> subsp. <i>dendrotricha</i> P3
W16	Represents habitat for <i>Diocirea acutifolia</i> P3
W17	Represents habitat for <i>Phlegmatospermum eremaeum</i> P3
W18	Represents habitat for <i>Diocirea acutifolia</i> P3 Represents habitat for <i>Eremophila praecox</i> P1
W19	Restricted distribution within regional study area Restricted distribution across combined B2018 study area and regional study area
W23	Restricted distribution within regional study area Restricted distribution across combined B2018 study area and regional study area
W24	Restricted distribution within regional study area Restricted distribution across combined B2018 study area and regional study area
Mosaic	Represents habitat for <i>Calandrinia</i> sp. Widgiemooltha P1 Restricted distribution across combined B2018 study area and regional study area

## 6 DISCUSSION

In assessing development proposals, the EPA's environmental objective for the factor Flora and Vegetation is its protection so that biological diversity and ecological integrity are maintained (EPA 2016b). Accordingly, the aim of this assessment was to determine the conservation significant flora and vegetation present or likely to be present in the regional study area to provide a regional context for developments in the SIGM tenements around Lake Lefroy.

### 6.1 FLORA

The number of plant taxa recorded from the current study is at the lower end of the scale for taxa recorded in previous regional surveys for St Ives Gold Mine (Table 6-1). The number of taxa recorded per unit area was equivalent to one other survey but lower than all other surveys. Records of dominant flora species only and the inability to access one large section of the regional study area due to the presence of the active Jubilee mining operation has contributed to this figure.

Weed species typically comprise well below 10% of the taxa recorded in all regional surveys reflecting the Excellent to Pristine condition of most of the vegetation.

**Table 6-1 Comparison of regional flora and vegetation assessments conducted at the St Ives Gold Mine**

Survey	Study area (ha)	No. of taxa recorded			
		Species or subspecies (sub/species per ha)	Genera	Families	Introduced flora
This survey	60,223	164 (0.003)	65	33	4
Mattiske (1996)	NA	329	149	52	23
Jim's Weeds (2006)	43,818	229 (0.005)	93	43	11
Botanica Consulting (2012d)	104,900	268 (0.003)	123	46	13
Paul Armstrong and Associates (2016)	19,640	162 (0.008)	89	39	5

The current survey recorded all prominent families identified in previous surveys and these were similar throughout all flora and vegetation assessments (Table 6-2).



**Table 6-2 Species numbers of the most dominant plant families recorded in the regional study area in comparison with other regional studies**

Family	This study	Mattiske (1996)	Jim's Weeds (2006)	Botanica Consulting (2012d)	Paul Armstrong and Associates (2016)
Chenopodiaceae	18	41	30	41	19
Poaceae	8	31	5	14	7
Fabaceae	15	15	27	31	20
Scrophulariaceae	23	22	19	26	14
Asteraceae	10	53	26	27	14
Myrtaceae	31	38	27	40	27
<b>Total number of species</b>	<b>164</b>	<b>329</b>	<b>229</b>	<b>268</b>	<b>162</b>
<b>% dominant families comprise of all species recorded for the survey</b>	<b>64.0</b>	<b>60.8</b>	<b>58.5</b>	<b>66.8</b>	<b>62.3</b>

## 6.2 CONSERVATION SIGNIFICANT FLORA

Five of the 42 Priority species identified in the desktop assessment were recorded in the regional study area during the field survey. A population of a sixth species from the desktop assessment, *Prostanthera splendens* (P1), recorded just outside the regional study area was confirmed. One species, *Cryptandra crispula* (P3), not identified by the desktop assessment was recorded within the regional study area (Figure 5-2).

The records for *Pityrodia scabra* subsp. *dendrotricha* (P3) and *Cyathostemon divaricatus* (P1) confirmed previous records for these species. Multiple records for *Diocirea acutifolia* (P3) were also confirmed during the survey and included an additional four locations in the regional study area. The populations of *Allocasuarina eriochlamys* subsp. *grossa* (P3), *Calandrinia* sp. Widgiemooltha (F. Obbens & E. Reid FO 9/05) (P1) and *Cryptandra crispula* (P3) represent new records for these species in the regional study area.

*Allocasuarina eriochlamys* subsp. *grossa* (P3) has a broad distribution in the Coolgardie bioregion and typically inhabits rocky hill slopes and granite outcrops. The current record represents a new location not recorded on distribution maps (ALA 2017; DPaW 2017b) in similar habitat as that recorded previously for the species. The identity of the species was not recognised in the field and subsequently population size was not recorded. Another previous record for *Allocasuarina eriochlamys* subsp. *grossa* located within the regional study area could not be confirmed during the current survey. Habitat for the record is described as 'Thicket of *Acacia quadrimarginea* over mixed dwarf scrub' (Botanica Consulting 2012d). However, vegetation at the location provided occurred in *Eucalyptus* woodland on a flat plain in red clay-loam soil. It is apparent that there is an error in the coordinates provided for the record. In addition, the species was recorded in the same habitat as *Cyathostemon divaricatus* in the Botanica Consulting (2012d) and both species were recorded at a single location in the current survey. It is therefore likely that the record from the current survey should replace the record of the Botanica Consulting (2012d).

The populations of *Calandrinia* sp. Widgiemooltha (F. Obbens & E. Reid FO 9/05) (P1) represent a modest (approx. 10 km) northern extension of a recently recorded northern range extension (Phoenix 2017a) for the species. Habitat of the populations recorded for the current survey match those previously described for the species, i.e. extensive saline flats and samphire communities,

both of which are common around Lake Lefroy. There has been a paucity of survey effort for this species since its recognition as a distinct taxon and it is considered likely that the species is locally common around Lake Lefroy (F. Obbens 2016, pers. comm. to G. Wells). Further surveys may expand the known distribution of the species and may in turn influence its conservation status.

*Cryptandra crispula* (P3) was not identified as potentially present in the regional study area as the closest records for the species are located outside of the database search area and the species was not previously recorded in past flora and vegetation surveys. The population found in the regional study area represents a new location for the species within its mapped distribution (ALA 2017; DPaW 2017b). *C. crispula* was not recognised in the field and subsequently the size of the population was not recorded. The population was recorded in habitat similar to that of previous records, *Eucalyptus* woodland on a hill slope in red-brown sandy soil.

Previously recorded populations of *Cyathostemon divaricatus* (P1) (Botanica Consulting 2012d) were confirmed during the current survey including one population of 13 individuals, a solitary plant and one large population. No new populations of the species were identified within the regional study area. Field time constraints precluded conducting a thorough inventory of plant numbers and status (mature/juvenile) at the larger population. Botanica Consulting (2012d) recorded 100 plants in this area.

Numerous previous records for *Diocirea acutifolia* (P3) were confirmed during the current survey and an additional four new locations were recorded within the regional study area. The species was locally common at a number of locations and dominated the lower shrub stratum. The high number of plants present and field time constraints precluded conducting a thorough inventory of plant numbers and status (mature/juvenile) at the recorded locations. As the species is only known from 13 locations (ALA 2017), the large populations recorded within the regional study area may represent a substantial proportion of the total population for the species. Botanica Consulting (2012d) recorded in excess of 5,000 plants at 30 locations, the majority of which occur in the regional study area.

One population of *Pityrodia scabra* subsp. *dendrotricha* (P3) identified from the desktop review within the regional study area was confirmed during the current survey and five mature/flowering individuals were recorded at this location. No plants were located at a second previous locality within the regional study area indicating that the solitary mature plant recorded in 2004 has perished. It is possible that the species persists in this area as seed in the soil seed bank. No new populations of the species were recorded within the regional study area. *P. s.* subsp. *dendrotricha* has a broad distribution that extends from the Coolgardie to the Mallee bioregion but is only known from nine locations (ALA 2017), one of which no longer supported extant plants at the time of the current survey. The two records in the regional study area therefore represent almost a quarter of the known locations.

No plants of *Prostanthera splendens* (P1) could be located at two records identified in the regional study area in the desktop review (dated 1981 and 1994) and the habitat descriptions for these records (i.e. *Eucalyptus stricklandii* woodland on granitic breakaway) did not match the habitat at the provided locations suggesting that the coordinates of the previous records are erroneous. A third record (dated 1989) was not revisited during the current survey due to access restraints and this record is not mentioned in previous regional surveys. Data from the DPaW record describes the plant as locally frequent at this site. As such, in the absence of the opportunity to search the area of this record it should be assumed that it is still present as extant plants and/or seed in the soil seed bank. One record for the species located outside of the regional study area was confirmed as present.

There was no access to the record for *Eremophila annosocaulis* (P3) identified in the desktop review within the regional study area during the current survey and no mention of this species/record in

previous regional assessments. Data from the DPaW database search conducted specifies that the species was recorded at this location in 1990 and it was described as common. As such, in the absence of the opportunity to search the area of this record it may be assumed that it is still present as extant plants and/or seed in the soil seed bank.

The plants of *Eremophila perglandulosa* (P1) and *E. praecox* (P1) previously recorded within the regional study area appear to have died out as they could not be confirmed in the current or a previous survey (Botanica Consulting 2012d). It is possible that the species remain at these locations as seed in the soil seedbank.

The record for *Phlegmatospermum eremaeum* (P3) within the regional study area was not revisited during the current survey due to access restrictions but no plants were recorded at this location during a previous survey (Botanica Consulting 2012d). *Phlegmatospermum eremaeum* is an annual herb recorded flowering in June, August and October (DPaW 2017a) and may simply have completed its annual cycle by the time of the Botanica Consulting (2012d) survey in September to November 2011. The species may persist at the recorded location as seed in the soil seed bank.

A record for *Ptilotus rigidus* (P1) in the regional study area was not revisited during the current survey due to access restrictions. Despite this, the location of the record (dated 1968) would appear to be erroneous as the habitat is described as kopi vegetation on salt swamp, but the coordinates are located in *Eucalyptus* woodland some distance from any salt lake.

No plants were located at a record for *Trachymene pyrophila* (P2) within the regional study area and no plants were found during a previous survey (Botanica Consulting 2012d). *Trachymene pyrophila* is an annual herb recorded flowering in November to January and March (DPaW 2017a). Despite the lack of plants being located by two surveys conducted at appropriate times for the species to be flowering the species may persist at this location as seed in the soil seed bank.

The survey of the B2018 study area (Phoenix 2017a) identified the presence of three Priority species, *Ptilotus rigidus* (P1), *Calandrinia* sp. Widgiemooltha (F. Obbens & E. Reid FO 9/05) (P1) and *Tecticornia mellarium* (P1). Records of a fourth species, *Pityrodia scabra* subsp. *dendrotricha* (P3), were not confirmed during the survey of the B2018 study area but were considered likely to persist. Populations of *Calandrinia* sp. Widgiemooltha (F. Obbens & E. Reid FO 9/05) (P1) and *Pityrodia scabra* subsp. *dendrotricha* (P3) were located within the regional study area but no further populations of *Ptilotus rigidus* (P1) or *Tecticornia mellarium* (P1) were identified. Both *Ptilotus rigidus* (P1) and *Tecticornia mellarium* (P1) were located in riparian vegetation in the B2018 study area. In addition, the chenopod shrublands of the lake playa and beaches represented habitat for the two locally conservation significant *Tecticornia* spp. from the B2018 study area.

Only a small area of riparian vegetation was present in the regional study area and due to access and time constraints a large proportion of these vegetation types were not searched. Review of aerial imagery indicates that large sections of the Lake Lefroy shoreline that occur outside of both the B2018 and regional study areas are likely to provide suitable habitat for these Priority and locally significant flora.

The identification of two more populations of *Calandrinia* sp. Widgiemooltha (P1) in the regional study area and the presence of large areas of suitable habitat for this species support the assumption that this species may be more widespread than is currently known. *Pityrodia scabra* subsp. *dendrotricha* (P3) has been recorded either during the current survey or in past surveys on riparian dune in *Eucalyptus* woodland and in *Eucalyptus* woodland on red sand plain indicating that substantial habitat for this species occurs within both the B2018 and regional study areas and also in the broader region.

*Eremophila perglandulosa* (P1) and *Trachymene pyrophila* (P2) were recorded in vegetation types W4 and W7 respectively in the regional study area. The W7 vegetation type was the most



widespread vegetation within the B2018 study area, W4 the third most widespread indicating the presence of suitable habitat for these Priority species.

A previous study by Botanica Consulting (2012d) identified *Cratystylis microphylla* x *conocephala* as a significant flora species due to it being a hybrid of *Cratystylis microphylla* and *C. conocephala* and 'little is known about this hybridized species and the genus *Cratystylis* as a whole requires further research' (Botanica Consulting 2012d). The putative hybrid *Cratystylis conocephala* x *microphylla* was recognised in a review of the *Cratystylis* genus (Wilson & Albrecht 2002) and included in the key to the species. However, the hybrid is not recognised on the state herbarium Florabase (DPaW 2017a) and does not have a conservation status under either the EPBC Act or WC Act or as a Priority species.

A record in the regional study area for *Scaevola bursariifolia* represents an approximately 100 km northern range extension for the species that may be considered locally significant as it represents the northern limit of the known distribution. This species was recorded in the W14 vegetation type which was not recorded in the B2018 study area (Phoenix 2017a).

Of the nine taxa from the current survey that could not be identified definitively to species level, four may potentially represent Priority Flora (Table 6-3).

**Table 6-3 Likelihood that unidentified species may represent conservation significant species**

Taxa	Likelihood of conservation significance
<i>Calandrinia</i> sp. Intergrade	Likely, appears to be an intergrade between the Priority 1 species <i>Calandrinia</i> sp. Widgiemooltha and <i>C. eremaea</i> .
<i>Tecticornia</i> SIRS20	Possible, <i>Tecticornia flabelliformis</i> previously recorded within vicinity of study area.
<i>Cyathostemon</i> SIRS1	Possible, conservation significant species of this genus occur in the bioregion in similar habitat.
<i>Eucalyptus websteriana</i> ?subsp. <i>websteriana</i>	Likely, apparent intergrade between this unthreatened sub-species and the Priority 1 sub-species <i>E. websteriana</i> subsp. <i>norsemanica</i> (F. Obbens December 2016, pers. comm. to G. Wells)
<i>Lepidosperma</i> ? <i>viscidum</i>	Highly unlikely, specimen resembled the unthreatened species
<i>Phebalium</i> ? <i>lepidotum</i>	Highly unlikely, specimen resembled the unthreatened species and was dissimilar to conservation significant species recorded for the Coolgardie bioregion
<i>Triodia</i> ? <i>irritans</i>	Highly unlikely, specimen resembled the unthreatened species and no conservation significant species of this genus recorded for the Coolgardie bioregion.
<i>Triodia</i> ? <i>scariosa</i>	Highly unlikely, specimen resembled the unthreatened species and no conservation significant species of this genus recorded for the Coolgardie bioregion.
<i>Trymalium</i> ? <i>myrtillus</i> subsp. <i>myrtillus</i>	Highly unlikely, specimen resembled the unthreatened species and no conservation significant species of this genus recorded for the Coolgardie bioregion.

The unidentified *Calandrinia* sp. appeared to be an intergrade between the Priority 1 species *C. sp.* Widgiemooltha (F. Obbens & E. Reid FO 9/05) and *C. eremaea* (F. Obbens pers. com. to Grant Wells,

December 2016). Further collections and study are required to determine whether the specimens represent a new species or is a hybrid between these two species. This species may be considered locally significant as the specimens collected exhibit anomalous features that indicate a potential new species. This species was recorded growing in association with chenopod shrubs in the understorey of the W4 vegetation type that is present in both the B2018 and regional study areas.

The unidentified *Tecticornia* species may represent a conservation significant species, *Tecticornia flabelliformis*, identified by the desktop review as potentially occurring within the regional study area. The unidentified species occurred in suitable habitat for this Priority 1 species.

The unidentified *Cyathostemon* sp. did not appear similar to *C. divaricatus* and was recorded in habitat (shrubland on yellow sandplain) dissimilar to that recorded for the Priority 1 species. However, several other Priority *Cyathostemon* spp. have been recorded in the Coolgardie bioregion including *C. verrucosus* (P3) recorded in shrubland communities on yellow sandplain (Trudgen & Rye 2014). *Cyathostemon verrucosus* was previously confused with *C. heteranthus* (also recorded in the Coolgardie bioregion) and the possibility that the unidentified specimen may be one of these species cannot be discounted. This species was recorded in the S9 vegetation type that was not recorded in the B2018 study area (Phoenix 2017a) and was restricted to yellow sandplain in the section of the regional study area located in the Southern Cross sub-region of the Coolgardie bioregion.

The unidentified sub-species of *Eucalyptus websteriana* was an apparent intergrade between the unthreatened *E. websteriana* subsp. *websteriana* and the Priority 1 *E. websteriana* subsp. *norsemanica*. The short (< 6 mm) pedicels on the specimen collected indicate the Priority 1 sub-species however; the distinctly pruinose branchlets and fruit on the specimen are representative of the unthreatened sub-species that is also more common in the regional study area (F. Obbens December 2016, pers. comm. to G. Wells). Intergrades between the two sub-species have been reported to occur near Lake Lefroy (Hill & Johnson 1992). The species may be considered locally conservation significant as the specimens collected exhibit anomalous features. This species was recorded in the W22 vegetation type which aligns with the Very open mallee of *Eucalyptus websteriana* over thicket of *Acacia quadrimarginea* / *Acacia* sp. narrow phyllode of Botanica Consulting (2012d) within which the Priority 1 species *E. websteriana* subsp. *norsemanica* was recorded. Neither the W22 vegetation type or the aligned Botanica Consulting (2012d) woodland occur in the B2018 study area (Phoenix 2017a).

### 6.3 VEGETATION

The majority of the vegetation types defined for the regional study area are representative of the broad vegetation types mapped by Shepherd *et al.* (2002). Each of the vegetation types mapped are classed as Least Concern as in excess 90% of pre-European extent remain (Government of Western Australia 2013a). Consequently, the majority of the vegetation in the regional study area represents widespread communities that are well represented at a regional level.

Throughout the regional study area, vegetation was predominantly recorded in Pristine or Excellent condition. For the current and past vegetation assessments both the number and extent of weed species recorded was low, reflecting an overall low level of disturbance.

None of the vegetation types of the regional study area was considered to resemble a TEC or PEC.

The number of vegetation types defined for the current survey (34) is higher than for the previous regional assessments, 19 defined by Botanica Consulting (2012d), 28 defined by Mattiske (1996) and 20 defined by Paul Armstrong and Associates (2016). Vegetation descriptions also vary considerably between each assessment. The disparities have predominantly arisen from differences in the size of the survey areas (Table 6-1) and the different approaches taken to define vegetation types.

The current assessment utilised a statistical analysis to group survey sites according to species presence and was conducted in accordance with current guidelines (EPA 2016c). None of the previous assessments provide a methodology for defining vegetation types which therefore appear highly subjective. In addition, the former assessments also differ from the current survey in terms of the terminology utilised to describe the vegetation. The current assessment adheres to (NVIS 2003); in contrast, Paul Armstrong and Associates (2016) utilised the vegetation classification system of (Muir 1977), the other former assessments provide no reference to the terminology utilised to describe vegetation.

Despite the disparities in delimiting and describing vegetation types, the majority of those defined for the current assessment broadly align with vegetation described by one or more described in previous assessments:

- The R1 vegetation type of the current assessment aligns with the Low woodland of *Callitris columellaris* defined by Botanica Consulting (2012d), the S1 vegetation type of Matiske (1996) (Very open woodland of *Callitris glaucophylla*<sup>5</sup> with occasional *Eucalyptus griffithsii* over patchy shrubs of *Acacia sclerosperma* subsp. *sclerosperma* and *Jacksonia foliosa* over sparse cover of *Triodia irritans* or *Triodia scariosa*) and the Sand Ridge Scrub component of the Lakes Edge vegetation described by Paul Armstrong and Associates (2016).
- The R2 vegetation type of the current assessment aligns with the S2 vegetation type of Matiske (1996) (Open shrubland dominated by *Jacksonia foliosa*<sup>6</sup> and *Darwinia* aff. *diosmoides*), the Heath of *Melaleuca thyoides* (riparian salt lake) defined by Botanica Consulting (2012d) and the Low Heath component of the Lakes Edge vegetation described by Paul Armstrong and Associates (2016).
- The C1 and C2 vegetation types of the current assessment align with the H2 vegetation type of Matiske (1996) Halophytic complex dominated by Chenopodiaceae sp. and *Frankenia pauciflora* and the Samphire component of the Lakes Edge vegetation described by Paul Armstrong and Associates (2016).
- The C3 vegetation type of the current assessment aligns with the Low heath of *Cratystylis microphylla* and/or the Low heath of *Cratystylis subspinescens* vegetation types defined by Botanica Consulting (2012d).
- The S2 vegetation type of the current assessment aligns with the Low heath of mixed chenopods (*Tecticornia indica*, *Atriplex vesicaria*, *Maireana pyramidata*) of Botanica Consulting (2012d) and the S3 vegetation type of Matiske (1996), very open low scrub of regenerating shrubs including *Melaleuca* species over Chenopodiaceae spp., mixed shrubs and succulents.
- The S3 vegetation type of the current assessment aligns with the Thicket of *Acacia quadrimarginea* vegetation type of Botanica Consulting (2012d) and the *Acacia quadrimarginea* shrubland described by Paul Armstrong and Associates (2016).

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<sup>5</sup> *Callitris glaucophylla* has been renamed *C. columellaris*; *Jacksonia foliosa* has been erroneously identified, the correct species is *Jacksonia arida*; the former is not recorded for the bioregion and occurs on lateritic hills slopes not kopi sand dunes; *Acacia sclerosperma* subsp. *sclerosperma* has subsequently been identified as *Acacia ligulata*.

<sup>6</sup> *Jacksonia foliosa* has been erroneously identified, the correct species is *Jacksonia arida*, the former is not recorded for the bioregion and occurs on lateritic hills slopes not kopi sand dunes; the *Darwinia* sp. has subsequently been identified as *Darwinia* sp. Karonie.



- The S8 vegetation type of the current assessment aligns with the Thicket of *Acacia quadrimarginea* vegetation type of Botanica Consulting (2012d) and variation 1 of the Rocky Outcrops vegetation described by Paul Armstrong and Associates (2016).
- The S10 vegetation type of the current assessment aligns with the Low woodland of *Eucalyptus salmonophloia* over dwarf scrub of *Maireana sedifolia* defined by Botanica Consulting (2012d).
- The W1 vegetation type of the current assessment aligns to the Low woodland of *Eucalyptus salmonophloia* of Botanica Consulting (2012d) and the *Eucalyptus salmonophloia* woodland described by Paul Armstrong and Associates (2016).
- The W2 vegetation type of the current assessment aligns to S1 vegetation type of Matiske (1996), Very open woodland of *Callitris glaucophylla*<sup>7</sup> with occasional *Eucalyptus griffithsii* over patchy shrubs of *Acacia sclerosperma* subsp. *sclerosperma* and *Jacksonia foliosa* over sparse cover of *Triodia irritans* or *Triodia scariosa*.
- The W3 vegetation type of the current assessment aligns with the Low *Eucalyptus salubris* woodland of Botanica Consulting (2012d) and the F1, F2 and F5 vegetation types of Matiske (1996) and the *Eucalyptus salubris* woodland described by Paul Armstrong and Associates (2016).
- The W4 vegetation type of the current assessment aligns with the Low woodland of mixed Eucalypts and the open mallee/low woodland of *Eucalyptus oleosa* of Botanica Consulting (2012d) and the *Eucalyptus oleosa* and *E. lesouefii* woodlands described by Paul Armstrong and Associates (2016).
- The W5 vegetation type of the current assessment aligns the Open mallee/woodland of *Eucalyptus griffithsii* and the Low woodland of mixed Eucalypts of Botanica Consulting (2012d) and the *Eucalyptus griffithsii* woodland described by Paul Armstrong and Associates (2016).
- The W6 vegetation type of the current assessment aligns with the Low woodland of mixed Eucalypts of Botanica Consulting (2012d).
- The W7 vegetation type of the current assessment aligns with the Low woodland of mixed Eucalypts and the Mallee of mixed Eucalypts of Botanica Consulting (2012d).
- The W8 vegetation type of the current assessment aligns with the R10 vegetation type of Matiske (1996), Low Woodland of *Eucalyptus lesouefii* and *Eucalyptus transcontinentalis* over mixed low Chenopodiaceae species on alkaline loamy soils and the *Eucalyptus lesouefii*, *E. oleosa* and *E. transcontinentalis* woodlands described by Paul Armstrong and Associates (2016).
- The W9 and W10 vegetation types of the current assessment aligns with the Low woodland of *Eucalyptus salmonophloia* and *E. lesouefii* over mixed low scrub of Botanica Consulting (2012d) and the *Eucalyptus lesouefii* and *E. salmonophloia* woodlands described by Paul Armstrong and Associates (2016).

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<sup>7</sup> *Callitris glaucophylla* has been renamed *C. columellaris*; *Jacksonia foliosa* has been erroneously identified, the correct species is *Jacksonia arida*, the former is not recorded for the bioregion and occurs on lateritic hills slopes not kopi sand dunes; *Acacia sclerosperma* subsp. *Sclerosperma* has subsequently been identified as *acacia ligulata*.

- The W11 vegetation type of the current assessment aligns with the Low woodland of *Eucalyptus oleosa* over low scrub of *Maireana sedifolia* and *Senna artemisioides* subsp. *filifolia* and the Open mallee of *Eucalyptus griffithsii* over scrub of *Acacia* sp. narrow phyllode vegetation types of Botanica Consulting (2012d) and the R15 vegetation type of Matiske (1996), Woodland to Very Open Woodland of *Eucalyptus griffithsii* over mixed shrub species on clay loams.
- The W12 vegetation type of the current assessment aligns with the F2 vegetation type of Matiske (1996), Open Woodland of *Eucalyptus salubris* var. *salubris* over *Ptilotus obovatus*, *Acacia hemiteles*, *Eremophila* and Chenopodiaceae species over dense annual Poaceae and Asteraceae species in lower slope regions on heavy clays and the *Eucalyptus salmonophloia* woodland described by Paul Armstrong and Associates (2016).
- The W13 vegetation type of the current assessment aligns with the *Eucalyptus celastroides*, *E. transcontinentalis* and *E. yilgarnensis* woodlands described by Paul Armstrong and Associates (2016).
- The W14 vegetation type of the current assessment aligns with the *Eucalyptus oleosa* and *E. griffithsii* woodlands described by Paul Armstrong and Associates (2016).
- The W15 vegetation type of the current assessment aligns with the Low woodland of *Eucalyptus lesouefii* and *E. urna* over hummock grassland of *Triodia scariosa* and the Low woodland of *Eucalyptus urna* over scrub of *Melaleuca sheathiana* vegetation types of Botanica Consulting (2012d).
- The W16 vegetation type of the current assessment aligns with the Low forest of *Eucalyptus ravida* and Low woodland of *Eucalyptus salmonophloia* and *E. ravida* over dwarf scrub of *Atriplex vesicaria* vegetation types of Botanica Consulting (2012d).
- The W17 vegetation type of the current assessment aligns with the F1 vegetation type of Matiske (1996), Tall open woodland of *Eucalyptus salmonophloia* and *E. salubris* with pockets of *E. lesouefii* over mixed low Chenopodiaceae species and sparse shrubs on red clays on broad valley floors, the low woodland of *Eucalyptus salubris* and *E. salmonophloia* over dwarf scrub of *Tecticornia disarticulata* of Botanica Consulting (2012d) and the *Eucalyptus salmonophloia* and *E. salubris* woodlands described by Paul Armstrong and Associates (2016).
- The W18 vegetation type of the current assessment aligns with the Low woodland of mixed Eucalypts over low scrub of *Atriplex nummularia*, *A. vesicaria*, *Eremophila scoparia* and *Maireana sedifolia* and the low woodland of *Eucalyptus salubris* over dwarf scrub of mixed chenopods of Botanica Consulting (2012d) and the *Eucalyptus salmonophloia* and *E. salubris* woodlands described by Paul Armstrong and Associates (2016).
- The W19 vegetation type of the current assessment aligns with the R14 vegetation type of Matiske (1996), Woodland of *Eucalyptus stricklandii*, *E. celastroides* subsp. *celastroides* and *E. lesouefii* over mixed shrubland dominated by *Dodonaea ptarmicaefolia* and *Eremophila* species over *Triodia* species over mixed open hermland on lateritic breakaways, the low woodland of *Eucalyptus stricklandii* of Botanica Consulting (2012d) and the *Eucalyptus stricklandii* woodland described by Paul Armstrong and Associates (2016).
- The W20 vegetation type of the current assessment aligns with the *Eucalyptus oleosa* woodland described by Paul Armstrong and Associates (2016).

- The W21 vegetation type of the current assessment aligns with the R9 vegetation type of Mattiske (1996), Low woodland of *Eucalyptus torquata* over low mixed shrubs on rocky hill slopes and the Low woodland of *Eucalyptus torquata* of Botanica Consulting (2012d).
- The W22 vegetation type of the current assessment aligns with the Very open mallee of *Eucalyptus websteriana* over thicket of *Acacia quadrimarginea* / *Acacia* sp. narrow phyllode of Botanica Consulting (2012d).
- The W24 vegetation type of the current assessment aligns with the Thicket of *Acacia* sp. narrow phyllode over mixed low scrub of Botanica Consulting (2012d).

The S9 vegetation type of the current assessment did not align with any of the vegetation types described in the previous regional surveys and was not recorded in the B2018 study area (Phoenix 2017a). This vegetation was recorded in a section of the regional study area that occurred in the Southern Cross sub-region and had not been mapped in any of the previous regional assessments as these were confined to the Eastern Goldfields sub-region. The vegetation occurred in a habitat type, undulating plain with yellow sandy soil, not recorded in any of the prior surveys. These yellow sandplains were recorded on and are characteristic of the Boorabin land system (Payne *et al.* 1998) and the Southern Cross sub-region (Cowan *et al.* 2001).

The W23 vegetation type of the current survey did not align with any of the vegetation types defined by the previous regional assessments and was not recorded in the B2018 study area (Phoenix 2017a). A small area of this vegetation type was recorded in an area previously mapped as Dwarf scrub of *Tecticornia disarticulata* / *Tecticornia indica* and *Disphyma crassifolium* (Botanica Consulting 2012d).

Each of the woodland vegetation types defined for the B2018 study area (Phoenix 2017a) were recorded in the regional study area. With the exception of the W2 community, for which only an additional 14 ha was recorded in the regional study area, in excess of 500 ha and frequently thousands of hectares of the remaining six woodland communities from the B2018 study area were identified in the regional study area indicating that these vegetation types are common and widespread.

About two thirds of the vegetation types defined for the regional study area may be considered locally significant as they represent habitat for conservation significant species and/or have a restricted local distribution within the regional study area and/or the combined study area. Notably, several woodland vegetation types in the regional study area are considered locally significant due to the presence of conservation significant flora. This includes woodland vegetation types (W4 and W7) also recorded in the B2018 study area.

The W6 and C3 vegetation types were considered locally significant in the B2018 study area due to restricted distribution (Phoenix 2017a); however, a large area of these were recorded for the regional study area. Therefore, when both study areas are considered, W6 and C3 are not locally significant for restricted distributions. In contrast, the W2 vegetation type was considered locally significant in the regional study area due to restricted distribution but not for the B2018 study area (Phoenix 2017a). When the total area of W2 within the combined study areas is considered (176.8 ha, 0.17%) this vegetation type may be considered locally significant due to restricted distribution.

Additional occurrences of the C1-2, R1-2 and S2 communities from the B2018 study area were also recorded in the regional study area. Notably, no additional patches of the R3, S1 and S4-7 vegetation types and only a very small area of S3 were identified in the regional survey indicating that vegetation associated with the riparian areas of Lake Lefroy may be regionally restricted. R3, S1, S3, S4 and S7 are of particular note as they were considered locally significant in the B2018 study area due to restricted distribution (Phoenix 2017a). However, the regional study area did not encompass



a large section of the riparian zone and aerial imagery indicates that much of the unmapped shoreline of the lake may be comprised of these restricted vegetation types.

As for the B2018 study area, locally significant vegetation was predominantly defined by the vegetation communities associated with the riparian zone of Lake Lefroy. Due to the limited representation of these in the regional study area, the regional survey findings therefore do not alter the significance of the riparian vegetation types mapped in the B2018 study area (Phoenix 2017a). It is recommended that future regional surveys include further sampling of the riparian communities around Lake Lefroy to better define the distribution.

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## Appendix 1 Western Australian Flora and Fauna Conservation Codes (DPaW 2015)

Specially protected fauna or flora are species\* which have been adequately searched for and are deemed to be, in the wild, either rare, at risk of extinction, or otherwise in need of special protection, and have been gazetted as such.

Categories of specially protected fauna and flora are:

### **T Threatened species**

Published as Specially Protected under the Wildlife Conservation Act 1950, and listed under Schedules 1 to 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora (which may also be referred to as Declared Rare Flora).

**Threatened fauna** is that subset of 'Specially Protected Fauna' declared to be 'likely to become extinct' pursuant to section 14(4) of the Wildlife Conservation Act.

**Threatened flora** is flora that has been declared to be 'likely to become extinct or is rare, or otherwise in need of special protection', pursuant to section 23F(2) of the Wildlife Conservation Act.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

### **CR Critically endangered species**

Threatened species considered to be facing an extremely high risk of extinction in the wild. Published as Specially Protected under the Wildlife Conservation Act 1950, in Schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.

### **EN Endangered species**

Threatened species considered to be facing a very high risk of extinction in the wild. Published as Specially Protected under the Wildlife Conservation Act 1950, in Schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.

### **VU Vulnerable species**

Threatened species considered to be facing a high risk of extinction in the wild. Published as Specially Protected under the Wildlife Conservation Act 1950, in Schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.

### **EX Presumed extinct species**

Species which have been adequately searched for and there is no reasonable doubt that the last individual has died. Published as Specially Protected under the Wildlife Conservation Act 1950, in Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Presumed Extinct Fauna and Wildlife Conservation (Rare Flora) Notice for Presumed Extinct Flora.

### **IA Migratory birds protected under an international agreement**

Birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and the Bonn Convention, relating to the protection of migratory birds. Published as Specially Protected under the Wildlife Conservation Act 1950, in Schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice.

### **CD Conservation dependent fauna**

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened. Published as Specially Protected under the Wildlife Conservation Act 1950, in Schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice.

**OS Other specially protected fauna**

Fauna otherwise in need of special protection to ensure their conservation. Published as Specially Protected under the Wildlife Conservation Act 1950, in Schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice.

**P Priority species**

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened flora or fauna.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

**1 Priority 1: Poorly-known species**

Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

**2 Priority 2: Poorly-known species**

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

**3 Priority 3: Poorly-known species**

Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

**4 Priority 4: Rare, Near Threatened and other species in need of monitoring**

- (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands.
- (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for Vulnerable, but are not listed as Conservation Dependent.
- (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

**Appendix 2 Vegetation structural classes (NVIS)****Height Classes**

Height	Growth form					
Height class	Height range (m)	Tree, vine (Mid & Upper), palm (single-stemmed)	Shrub, heath shrub, chenopod shrub, ferns, Samphire shrub, cycad, tree-fern, Grass-tree, palm (multi-stemmed)	Tree mallee, Mallee Shrub	Tussock grass, hummock grass, other grass, sedge, rush, forbs, vine (Ground)	Bryophyte, lichen, seagrass, aquatic
8	>30	tall	N/A	N/A	N/A	N/A
7	10-30	mid	N/A	tall	N/A	N/A
6	<10	low	N/A	mid	N/A	N/A
5	<3	N/A	N/A	low	N/A	N/A
4	>2	N/A	tall	N/A	tall	N/A
3	1-2	N/A	mid	N/A	tall	N/A
2	0.5-1	N/A	low	N/A	mid	tall
1	<0.5	N/A	low	N/A	low	low

**Structural Formation Classes**

Growth form	Height ranges (m)	Structural formation classes					
Foliage cover % (cover #)		70-100% (5)	30-70% (4)	10-30% (3)	<10% (2)	0-5% (1)	≈0% (N)
tree, palm	<10,10-30,>30	closed forest	open forest	woodland	open woodland	isolated trees	isolated clumps of trees
tree mallee	<3, <10, 10-30	closed mallee forest	open mallee forest	mallee woodland	open mallee woodland	isolated mallee trees	isolated clumps of mallee trees
shrub, cycad, grass-tree, tree-fern	<1,1-2,>2	closed shrubland	shrubland	open shrubland	sparse shrubland	isolated shrubs	isolated clumps of shrubs
mallee shrub	<3, <10, 10-30	closed mallee shrubland	mallee shrubland	open mallee shrubland	sparse mallee shrubland	isolated mallee shrubs	isolated clumps of mallee shrubs
heath shrub	<1,1-2,>2	closed heathland	heathland	open heathland	sparse heathland	isolated heath shrubs	isolated clumps of heath shrubs
chenopod shrub	<1,1-2,>2	closed chenopod shrubland	chenopod shrubland	open chenopod shrubland	sparse chenopod shrubland	isolated chenopod shrubs	isolated clumps of chenopod shrubs



Growth form	Height ranges (m)	Structural formation classes					
		closed	samphire	open	sparse	isolated	isolated
samphire shrub	<0.5,>0.5	samphire shrubland	samphire shrubland	samphire shrubland	samphire shrubland	samphire shrubs	clumps of samphire shrubs
hummock grass	<2,>2	hummock grassland	hummock grassland	hummock grassland	hummock grassland	hummock grasses	clumps of hummock grasses
tussock grass	<0.5,>0.5	tussock grassland	tussock grassland	tussock grassland	tussock grassland	tussock grasses	clumps of tussock grasses
other grass	<0.5,>0.5	grassland	grassland	grassland	grassland	grasses	clumps of grasses
sedge	<0.5,>0.5	sedgeland	sedgeland	sedgeland	sedgeland	sedges	clumps of sedges
rush	<0.5,>0.5	rushland	rushland	rushland	rushland	rushes	clumps of rushes
forb	<0.5,>0.5	forbland	forbland	forbland	forbland	forbs	clumps of forbs
fern	<1,1-2,>2	fernland	fernland	fernland	fernland	ferns	clumps of ferns
bryophyte	<0.5	bryophyteland	Bryophyte-land	bryophyte-land	bryophyte-land	bryophytes	clumps of bryophytes
lichen	<0.5	lichenland	lichenland	lichenland	lichenland	lichens	clumps of lichens
vine	<10,10-30,>30	vineland	vineland	vineland	vineland	vines	clumps of vines
aquatic	0-0.5,<1	aquatic bed	aquatic bed	aquatic bed	aquatics	aquatics	clumps of aquatics
seagrass	0-0.5,<1	seagrass bed	seagrass bed	seagrass bed	seagrass bed	seagrasses	clumps of seagrasses

**Appendix 3 Vegetation types mapped within the regional study area in previous assessments**

Vegetation code	Vegetation description
<b>Mattiske (1996)</b>	
F1	Tall Open Woodland of <i>Eucalyptus salmonophloia</i> - <i>Eucalyptus salubris</i> with pockets of <i>Eucalyptus lesouefii</i> over mixed low Chenopodiaceae spp. and sparse shrubs on red clays on broad valley floors.
F2	Open Woodland of <i>Eucalyptus salubris</i> over <i>Ptilotus obovatus</i> , <i>Acacia hemiteles</i> , <i>Eremophila</i> and mixed Chenopodiaceae spp. over dense daisies and grasses.
F3	Tall Open Woodland of <i>Eucalyptus salubris</i> with very occasional <i>Eucalyptus salmonophloia</i> over dense mixed low Chenopodiaceae sp.
F4	Disturbed Open Woodland of <i>Eucalyptus salmonophloia</i> over Chenopodiaceae and <i>Eremophila</i> sp.
F5	Woodland of <i>Eucalyptus salubris</i> over mixed low Chenopodiaceae and Asteraceae shrubs.
F6	Closed woodland of <i>Eucalyptus salmonophloia</i> over <i>Pimelea microcephala</i> subsp. <i>microcephala</i> over low shrubs of <i>Senna artemisioides</i> subsp. <i>filifolia</i> , <i>Eremophila scoparia</i> and <i>Ptilotus obovatus</i> over a dense herb layer, in drainage lines.
H1	Halophytic complex of <i>Halosarcia</i> sp.
H2	Halophytic complex dominated by Chenopodiaceae sp. and <i>Frankenia pauciflora</i> .
R1	Mixed Open Shrubland over mixed Open Herbland (annual daisies, grasses and Goodeniaceae spp.).
R2	Low mixed Shrubland over mixed Open Herbland (annual daisies, grasses and Goodeniaceae sp.).
R5	Mixed Open Shrubland dominated by <i>Eremophila clarkei</i> and <i>Prostanthera grylloana</i> .
R6	Tall Open Woodland of <i>Eucalyptus salmonophloia</i> and <i>Eucalyptus salubris</i> over mixed shrubs.
R7	Open Woodland of <i>Eucalyptus lesouefii</i> and <i>Eucalyptus griffithsii</i> over mixed shrubs and herblands (annual daisies and grasses).
R8	Closed Shrubland of <i>Eremophila scoparia</i> , <i>Eremophila decipiens</i> , <i>Acacia erinacea</i> and <i>Exocarpos aphyllus</i> with emergent <i>Eucalyptus lesouefii</i> and occasional <i>Eucalyptus torquata</i> and <i>Casuarina pauper</i> .
R9	Low Woodland of <i>Eucalyptus torquata</i> over low mixed shrubs.
R13	Mixed Open Woodland of <i>Eucalyptus campaspe</i> , <i>Eucalyptus stricklandii</i> and <i>Eucalyptus salubris</i> over <i>Eremophila</i> and low mixed Chenopodiaceae sp..
R15	Woodland to Very Open Woodland of <i>Eucalyptus griffithsii</i> over mixed shrub species.
S1	Very open Woodland of <i>Callitris glaucophylla</i> with occasional <i>Eucalyptus griffithsii</i> over patchy shrubs of <i>Acacia sclerosperma</i> subsp. <i>sclerosperma</i> and <i>Jacksonia foliosa</i> over sparse cover of <i>Triodia irritans</i> or <i>Triodia scariosa</i> .
S2	Open Shrubland dominated by <i>Jacksonia foliosa</i> and <i>Darwinia</i> aff. <i>diosmoides</i> .
S4	Low Woodland of <i>Eucalyptus clelandii</i> and <i>Eucalyptus leptophylla</i> over sparse mixed shrubs and relatively dense <i>Triodia scariosa</i> .
S6	Open Woodland of <i>Eucalyptus ceratocorys</i> , <i>Eucalyptus salicola</i> and <i>Eucalyptus</i> sp. over <i>Triodia irritans</i> .
S9	Open Woodland of <i>Eucalyptus griffithsii</i> and <i>Eucalyptus longicornis</i> over sparse low

	mixed shrubs over <i>Triodia irritans</i> .
S10	Low Open Woodland of <i>Eucalyptus lesouefii</i> over sparse low mixed shrubs over <i>Triodia scariosa</i> .
S11	Open Woodland of <i>Eucalyptus striatocalyx</i> over very sparse open mixed shrubs and <i>Triodia scariosa</i> .
S12	Very open woodland of <i>Eucalyptus gracilis</i> and <i>Eucalyptus</i> sp. S (Brooker) with occasional <i>Casuarina pauper</i> over sparse mixed shrubs and relatively dense cover of <i>Triodia scariosa</i> .
F1/F4	Mosaic
S1/S6	Mosaic
S1/S6/S12	Mosaic
S6/S12	Mosaic
S8/S9	Mosaic
<b>Jim's Weeds (2006)</b>	
	<i>Acacia</i> shrublands upon granite hill rises
	Chenopod claypan/shrublands
	<i>Eucalyptus</i> over Spinifex sand dune
	<i>Eucalyptus</i> over Spinifex sand plain
	<i>Eucalyptus stricklandii</i> upon ridgelines and rocky breakaways
	<i>Eucalyptus torquata</i> upon greenstone hills
	Riparian vegetation
	Transitional <i>Eucalyptus</i> woodland
<b>Botanica Consulting (2012d)</b>	
	Dwarf scrub of <i>Tecticornia</i> spp. ( <i>Tecticornia disarticulata</i> , <i>T. indica</i> )
	Heath of <i>Melaleuca thyoides</i> (riparian-salt lake)
	Low forest/open woodland of <i>E. ravida</i>
	Low heath of <i>Cratystylis subspinescens</i>
	Low heath of mixed Chenopods ( <i>Tecticornia indica</i> , <i>Atriplex vesicaria</i> , <i>Maireana pyramidata</i> )
	Low scrub of <i>Senna artemisioides</i>
	Low woodland of <i>Callitris columellaris</i>
	Low woodland of <i>Casuarina obesa</i>
	Low woodland of <i>E. lesouefii</i>
	Low woodland of <i>E. lesouefii</i> / <i>E. ravida</i> (riparian-creekline)
	Low woodland of <i>E. salmonophloia</i>
	Low woodland of <i>E. salmonophloia</i> / <i>E. lesouefii</i> / <i>E. salubris</i>
	Low woodland of <i>E. salubris</i>
	Low woodland of <i>E. stricklandii</i>
	Low woodland of <i>E. torquata</i>
	Low woodland of <i>E. urna</i>



	Low woodland of mixed Eucalypts ( <i>E. transcontinentalis</i> , <i>E. salmonophloia</i> , <i>E. oleosa</i> , <i>E. griffithsii</i> )
	Mallee of mixed Eucalypts ( <i>E. lesouefii</i> , <i>E. oleosa</i> , <i>E. platycorys</i> ) over Spinifex
	Open mallee/ low woodland of <i>E. griffithsii</i>
	Open mallee/low woodland of <i>E. salicola</i>
	Open mallee/low woodland of <i>E. oleosa</i>
	Open mallee/low woodland of <i>E. platycorys</i>
	Thicket of <i>Acacia quadrimarginea</i>
	Thicket of <i>Acacia</i> sp. narrow phyllode
	Very open mallee of <i>E. websteriana</i>
<b>Paul Armstrong and Associates (2016)</b>	
	<i>Acacia acuminata</i>
	<i>Eucalyptus transcontinentalis</i>
	Lakes edge
	<i>Melaleuca sheathiana</i>
	<i>Eucalyptus griffithsii</i>
	<i>Eucalyptus lesouefii</i>
	<i>Eucalyptus salmonophloia</i>

**Appendix 4    Taxa recorded in the study area, by family**

Family	Species
Aizoaceae	<i>Disphyma crassifolium</i>
	* <i>Mesembryanthemum nodiflorum</i>
Amaranthaceae	<i>Ptilotus drummondii</i>
	<i>Ptilotus helichrysoides</i>
	<i>Ptilotus obovatus</i>
	<i>Ptilotus</i> sp. Goldfields (R. Davis 10796)
	<i>Surreya diandra</i>
Apocynaceae	<i>Alyxia buxifolia</i>
Asparagaceae	<i>Lomandra effusa</i>
Asteraceae	<i>Angianthus tomentosus</i>
	<i>Cratystylis conocephala</i>
	<i>Cratystylis microphylla</i>
	<i>Cratystylis subspinescens</i>
	<i>Erymophyllum ramosum</i> subsp. <i>ramosum</i>
	<i>Olearia exiguiifolia</i>
	<i>Olearia muelleri</i>
	<i>Olearia pimeleoides</i>
	* <i>Oncosiphon suffruticosum</i>
	<i>Podolepis capillaris</i>
Boraginaceae	<i>Halgania andromedifolia</i>
Campanulaceae	<i>Isotoma petraea</i>
Casuarinaceae	<i>Allocasuarina acutivalvis</i> subsp. <i>acutivalvis</i>
	<i>Allocasuarina eriochlamys</i> subsp. <i>grossa</i> (P3)
	<i>Allocasuarina helmsii</i>
	<i>Casuarina pauper</i>
Chenopodiaceae	<i>Atriplex bunburyana</i>
	<i>Atriplex nana</i>
	<i>Atriplex nummularia</i>
	<i>Atriplex vesicaria</i>
	<i>Enchylaena tomentosa</i>
	<i>Maireana glomerifolia</i>
	<i>Maireana pyramidata</i>
	<i>Maireana radiata</i>
	<i>Maireana sedifolia</i>
	<i>Maireana tomentosa</i> subsp. <i>tomentosa</i>
	<i>Maireana trichoptera</i>

	<i>Maireana triptera</i>
	<i>Rhagodia drummondii</i>
	<i>Sclerolaena diacantha</i>
	<i>Sclerolaena fusiformis</i>
	<i>Tecticornia doliiformis</i>
	<i>Tecticornia SIRS20</i>
Cupressaceae	<i>Callitris columellaris</i>
	<i>Callitris preissii</i>
Cyperaceae	<i>Lepidosperma ?viscidum</i>
	<i>Lepidosperma sanguinolentum</i>
	<i>Schoenus subaphyllus</i>
Ericaceae	<i>Leucopogon</i> sp. Coolgardie (M. Hislop & F. Hort MH 3197)
Euphorbiaceae	<i>Bertya dimerostigma</i>
	<i>Beyeria lechenaultii</i>
Fabaceae	<i>Acacia burkittii</i>
	<i>Acacia erinacea</i>
	<i>Acacia hemiteles</i>
	<i>Acacia jennerae</i>
	<i>Acacia kalgoorliensis</i>
	<i>Acacia merrallii</i>
	<i>Acacia nyssophylla</i>
	<i>Acacia quadrimarginea</i>
	<i>Acacia resinimarginea</i>
	<i>Acacia resinistipulea</i>
	<i>Acacia tetragonophylla</i>
	<i>Dillwynia</i> sp. Coolgardie (V.E. Sands 637.3.1)
	<i>Senna artemisioides</i> subsp. <i>petiolaris</i>
	<i>Senna cardiosperma</i>
	<i>Senna glutinosa</i> subsp. <i>chatelainiana</i>
Frankeniaceae	<i>Frankenia interioris</i>
	<i>Frankenia setosa</i>
Goodeniaceae	<i>Cooperhooikia stropholata</i>
	<i>Scaevola bursariifolia</i>
	<i>Scaevola spinescens</i>
Lamiaceae	<i>Prostanthera incurva</i>
	<i>Prostanthera incurvata</i>
	<i>Prostanthera splendens</i> (P1)
	* <i>Salvia verbenaca</i>



	<i>Westringia cephalantha</i>
	<i>Westringia cephalantha</i> var. <i>cephalantha</i>
	<i>Westringia rigida</i>
Malvaceae	<i>Brachychiton gregorii</i>
Myrtaceae	<i>Calytrix tetragona</i>
	<i>Cyathostemon divaricatus</i> (P1)
	<i>Cyathostemon</i> SIRS1
	<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i>
	<i>Eucalyptus celastroides</i> subsp. <i>virella</i>
	<i>Eucalyptus cylindrocarpa</i>
	<i>Eucalyptus diptera</i>
	<i>Eucalyptus eremophila</i> subsp. <i>eremophila</i>
	<i>Eucalyptus griffithsii</i>
	<i>Eucalyptus leptopoda</i> subsp. <i>subluta</i>
	<i>Eucalyptus lesouefii</i>
	<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>
	<i>Eucalyptus ravida</i>
	<i>Eucalyptus salmonophloia</i>
	<i>Eucalyptus salubris</i>
	<i>Eucalyptus striaticalyx</i>
	<i>Eucalyptus stricklandii</i>
	<i>Eucalyptus torquata</i>
	<i>Eucalyptus transcontinentalis</i>
	<i>Eucalyptus urna</i>
	<i>Eucalyptus websteriana</i> ?subsp. <i>websteriana</i>
	<i>Eucalyptus yilgarnensis</i>
	<i>Homalocalyx thryptomenoides</i>
	<i>Leptospermum subtenue</i>
	<i>Melaleuca acuminata</i> subsp. <i>acuminata</i>
	<i>Melaleuca hamata</i>
	<i>Melaleuca lanceolata</i>
	<i>Melaleuca lateriflora</i>
	<i>Melaleuca pauperiflora</i> subsp. <i>fastigiata</i>
	<i>Melaleuca sheathiana</i>
	<i>Melaleuca zeteticorum</i>
Nitrariaceae	<i>Nitraria billardiarei</i>
Pittosporaceae	<i>Pittosporum angustifolium</i>
Poaceae	<i>Aristida contorta</i>

	<i>Austrostipa elegantissima</i>
	<i>Austrostipa platychaeta</i>
	* <i>Schismus arabicus</i>
	<i>Triodia ?irritans</i>
	<i>Triodia ?scariosa</i>
	<i>Triodia desertorum</i>
	<i>Triodia irritans</i>
Portulacaceae	<i>Calandrinia</i> sp. intergrade
	<i>Calandrinia</i> sp. Widgiemooltha (F. Obbens & E. Reid FO 9/05) (P1)
Proteaceae	<i>Grevillea acuaria</i>
	<i>Grevillea huegelii</i>
	<i>Grevillea oncogyne</i>
	<i>Hakea francisiana</i>
Rhamnaceae	<i>Cryptandra crispula</i> (P3)
	<i>Trymalium ?myrtillus</i> subsp. <i>myrtillus</i>
Rutaceae	<i>Phebalium ?lepidotum</i>
	<i>Phebalium tuberculosum</i>
Santalaceae	<i>Exocarpos aphyllus</i>
	<i>Santalum acuminatum</i>
Sapindaceae	<i>Dodonaea adenophora</i>
	<i>Dodonaea coriacea</i>
	<i>Dodonaea lobulata</i>
	<i>Dodonaea microzyga</i> var. <i>acrolobata</i>
	<i>Dodonaea viscosa</i>
Scrophulariaceae	<i>Diocirea acutifolia</i> (P3)
	<i>Eremophila alternifolia</i>
	<i>Eremophila caerulea</i> subsp. <i>caerulea</i>
	<i>Eremophila caperata</i>
	<i>Eremophila clavata</i>
	<i>Eremophila decipiens</i>
	<i>Eremophila decipiens</i> subsp. <i>decipiens</i>
	<i>Eremophila dempsteri</i>
	<i>Eremophila drummondii</i>
	<i>Eremophila georgei</i>
	<i>Eremophila glabra</i>
	<i>Eremophila interstans</i>
	<i>Eremophila interstans</i> subsp. <i>interstans</i>
	<i>Eremophila ionantha</i>

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	<i>Eremophila maculata</i> subsp. <i>brevifolia</i>
	<i>Eremophila oblonga</i>
	<i>Eremophila oldfieldii</i>
	<i>Eremophila oppositifolia</i>
	<i>Eremophila parvifolia</i> subsp. <i>auricampa</i>
	<i>Eremophila psilocalyx</i>
	<i>Eremophila saligna</i>
	<i>Eremophila scoparia</i>
	<i>Eremophila serrulata</i>
Solanaceae	<i>Lycium australe</i>
Thymelaeaceae	<i>Pimelea microcephala</i>
Violaceae	<i>Hybanthus floribundus</i> subsp. <i>curvifolius</i>
Zygophyllaceae	<i>Zygophyllum ovatum</i>



**Appendix 5     Flora survey site descriptions with species recorded at each site**

<b>Site:</b>	RS001	<b>Type:</b>	Relevé (20 m x 20 m)
<b>Date(s):</b>	08 November 2016	<b>Position:</b>	-31.478869, 121.838739
<b>Total vegetation cover (%):</b>	35	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	20	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	15	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus transcontinentalis</i> woodland over tall open <i>Melaleuca sheathiana</i> , <i>Eremophila scoparia</i> and <i>Santalum acuminatum</i> shrubland over mid <i>Halgania andromedifolia</i> , <i>Cratystylis conocephala</i> and <i>Scaevola spinescens</i> shrubland over sparse low <i>Olearia muelleri</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus transcontinentalis</i>	15.0	10.00		
<i>Halgania andromedifolia</i>	06.0	01.50		
<i>Melaleuca sheathiana</i>	05.0	05.00		
<i>Olearia muelleri</i>				
<i>Scaevola spinescens</i>				
<i>Cratystylis conocephala</i>				
<i>Santalum acuminatum</i>				
<i>Eremophila scoparia</i>				

<b>Site:</b>	RS002	<b>Type:</b>	Relevé (20 m x 20 m)
<b>Date(s):</b>	08 November 2016	<b>Position:</b>	-31.487616, 121.843955
<b>Total vegetation cover (%):</b>	40	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	15	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	25	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Excellent, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus salubris</i> , <i>Eucalyptus celastroides</i> subsp. <i>celastroides</i> and <i>E. lesoueffi</i> woodland over tall <i>Eremophila scoparia</i> , <i>E. ionantha</i> and <i>Exocarpos aphyllus</i> shrubland over low <i>Cratystylis conocephala</i> , <i>Ptilotus obovatus</i> , and <i>Westringia cephalantha</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus lesoueffi</i>	05.0	12.00		
<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i>	05.0	10.00		
<i>Westringia cephalantha</i>	04.0	00.40		
<i>Eremophila ionantha</i>	03.0	01.80		
<i>Ptilotus obovatus</i>				
<i>Cratystylis conocephala</i>				
<i>Exocarpos aphyllus</i>				
<i>Eremophila scoparia</i>				
<i>Eucalyptus salubris</i>				
<i>Senna artemisioides</i> subsp. <i>petiolaris</i>				



<b>Site:</b>	RS003	<b>Type:</b>	Relevé (20 m x 20 m)
<b>Date(s):</b>	08 November 2016	<b>Position:</b>	-31.497364, 121.849849
<b>Total vegetation cover (%):</b>	35	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	20	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	15	<b>Soil:</b>	sandy clay
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus ravida</i> , <i>E. lesoueffi</i> , <i>E. salmonophloia</i> , <i>E. celastroides</i> subsp. <i>celastroides</i> woodland over tall open <i>Eremophila dempsteri</i> , <i>E. scoparia</i> and <i>Acacia hemiteles</i> shrubland over mid open <i>Cratystylis conocephala</i> , <i>Atriplex nummularia</i> and <i>Tecticornia disarticulata</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Tecticornia disarticulata</i>	07.0	00.50		
<i>Eucalyptus ravida</i>	07.0	08.00		
<i>Eremophila dempsteri</i>	06.0	02.00		
<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i>	05.0	10.00		
<i>Atriplex nummularia</i>				
<i>Cratystylis conocephala</i>				
<i>Acacia hemiteles</i>				
<i>Eremophila scoparia</i>				
<i>Eucalyptus salmonophloia</i>				
<i>Eucalyptus lesoueffii</i>				

<b>Site:</b>	RS003a	<b>Type:</b>	Quadrat (20 m x 20 m)
<b>Date(s):</b>	08 November 2016	<b>Position:</b>	-31.545815, 121.81651
<b>Total vegetation cover (%):</b>	35	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	10	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	>5 years
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid open <i>Eucalyptus lesouefii</i> , <i>E. oleosa</i> subsp. <i>oleosa</i> and <i>E. salubris</i> woodland over mid sparse <i>Eremophila scoparia</i> shrubland over low <i>Maireana sedifolia</i> , <i>Atriplex vesicaria</i> and <i>Tecticornia disarticulata</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Tecticornia disarticulata</i>	15.0			
<i>Eucalyptus salubris</i>	06.0	10.00		
<i>Maireana sedifolia</i>	05.0	00.30		
<i>Eucalyptus lesouefii</i>	04.0	10.00		
<i>Atriplex vesicaria</i>	03.0	00.30		
<i>Eremophila scoparia</i>	01.0	01.50		
<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>	01.0	10.00		
<i>Maireana trichoptera</i>	00.1	00.10		
<i>Rhagodia drummondii</i>	00.1	00.40		
<i>Senna artemisioides</i> subsp. <i>petiolaris</i>	00.1	01.00		

<b>Site:</b>	RS003b	<b>Type:</b>	Quadrat (20 m x 20 m)
<b>Date(s):</b>	11 November 2016	<b>Position:</b>	-31.613733, 121.878059
<b>Total vegetation cover (%):</b>	40	<b>Topography:</b>	plain
<b>Tree/shrub cover &gt;2 m (%):</b>	25	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	30	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	ferrous – ironstone
<b>Herb cover (%):</b>	1	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	grazing – low, litter, vehicle tracks		
<b>Vegetation condition:</b>	Excellent, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus lesouefii</i> and <i>E. salmonophloia</i> woodland over sparse tall <i>Eremophila interstans</i> and <i>Santalum acuminatum</i> shrubland over low open <i>Atriplex vesicaria</i> , <i>Maireana sedifolia</i> and <i>Tecticornia disarticulata</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus lesouefii</i>	20.0	11.00		
<i>Tecticornia disarticulata</i>	10.0	00.50		
<i>Maireana sedifolia</i>	10.0	00.60		
<i>Eucalyptus salmonophloia</i>	05.0	20.00		
<i>Eremophila interstans</i>	05.0	02.50		
<i>Atriplex vesicaria</i>	03.0	00.40		
<i>Sclerolaena diacantha</i>	02.0	00.10		
<i>Eremophila scoparia</i>	02.0	01.50		
<i>Atriplex nummularia</i>	01.0	01.20		
<i>Eremophila glabra</i>	00.5	01.20		
<i>Maireana triptera</i>	00.5	00.30		
<i>Ptilotus obovatus</i>	00.5	00.30		
<i>Eremophila parvifolia</i> subsp. <i>auricampa</i>	00.2	00.30		
<i>Olearia muelleri</i>	00.1	00.20		
<i>Nitraria billardierei</i>	00.1	00.50		
<i>Zygophyllum ovatum</i>	00.1	00.10		
<i>Enchylaena tomentosa</i>	00.1	00.30		
<i>Mesembryanthemum nodiflorum</i>	00.1	00.03	*	
<i>Maireana radiata</i>	00.1	00.05		
<i>Schismus arabicus</i>	00.1	00.05	*	



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*Austrostipa elegantissima*

00.1

00.20

*Santalum acuminatum*

<b>Site:</b>	RS004	<b>Type:</b>	Relevé (20 m x 20 m)
<b>Date(s):</b>	08 November 2016	<b>Position:</b>	-31.505534, 121.854758
<b>Total vegetation cover (%):</b>	35	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	15	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus salmonophloia</i> and <i>E. lesouefii</i> woodland over tall <i>Melaleuca sheathiana</i> , <i>Eremophila scoparia</i> , <i>E. interstans</i> and <i>Santalum acuminatum</i> shrubland over low <i>Maireana sedifolia</i> , <i>Atriplex vesicaria</i> and <i>A. nana</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eremophila interstans</i> subsp. <i>interstans</i>	04.0	01.70		
<i>Atriplex vesicaria</i>	03.0	01.00		
<i>Atriplex nana</i>	03.0	00.70		
<i>Pimelea microcephala</i>	00.1	01.20		
<i>Olearia muelleri</i>				
<i>Maireana sedifolia</i>				
<i>Santalum acuminatum</i>				
<i>Eremophila interstans</i>				
<i>Eremophila scoparia</i>				
<i>Melaleuca sheathiana</i>				
<i>Eucalyptus lesouefii</i>				
<i>Eucalyptus salmonophloia</i>				

<b>Site:</b>	RS005	<b>Type:</b>	Relevé (20 m x 20 m)
<b>Date(s):</b>	08 November 2016	<b>Position:</b>	-31.515964, 121.860498
<b>Total vegetation cover (%):</b>	40	<b>Topography:</b>	hill slope
<b>Tree/shrub cover &gt;2 m (%):</b>	25	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	25	<b>Soil:</b>	gravel / alluvial, sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	<i>Eucalyptus lesouefii</i> and <i>E. salmonophloia</i> woodland over mid <i>Halgania andromedifolia</i> , <i>Eremophila oppositifolia</i> and <i>Eremophila ionantha</i> shrubland over low <i>Acacia erinacea</i> , <i>Eremophila parvifolia</i> subsp. <i>auricampa</i> and <i>Westringia cephalantha</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eremophila parvifolia</i> subsp. <i>auricampa</i>	02.0	00.20		
<i>Eremophila psilocalyx</i>	00.1	01.20		
<i>Westringia cephalantha</i>				
<i>Acacia erinacea</i>				
<i>Eremophila ionantha</i>				
<i>Eremophila oppositifolia</i>				
<i>Halgania andromedifolia</i>				
<i>Eucalyptus salmonophloia</i>				
<i>Eucalyptus lesouefii</i>				



<b>Site:</b>	RS006	<b>Type:</b>	Relevé (20 m x 20 m)
<b>Date(s):</b>	08 November 2016	<b>Position:</b>	-31.52751, 121.821888
<b>Total vegetation cover (%):</b>	75	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	73	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	5	<b>Soil:</b>	gravel / alluvial, sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	quartz
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Low open <i>Eucalyptus ravida</i> and <i>E. salubris</i> forest over sparse mid <i>Eremophila scoparia</i> and <i>Maireana sedifolia</i> shrubland over low open <i>Olearia muelleri</i> and <i>Tecticornia disarticulata</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus ravida</i>				
<i>Tecticornia disarticulata</i>				
<i>Olearia muelleri</i>				
<i>Maireana sedifolia</i>				
<i>Eremophila scoparia</i>				
<i>Eucalyptus salubris</i>				

<b>Site:</b>	RS007	<b>Type:</b>	Relevé (20 m x 20 m)
<b>Date(s):</b>	08 November 2016	<b>Position:</b>	-31.518626, 121.816279
<b>Total vegetation cover (%):</b>	35	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	20	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	15	<b>Soil:</b>	sand, clay loam,
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus lesouefii</i> , <i>E. salmonophloia</i> and <i>E. salubris</i> woodland over tall open <i>Eremophila interstans</i> and <i>E. scoparia</i> shrubland over mid open <i>Cratystylis conocephala</i> , <i>Senna artemisioides</i> subsp. <i>petiolaris</i> and <i>Eremophila glabra</i> shrubland over sparse low <i>Olearia muelleri</i> and <i>Eremophila parvifolia</i> subsp. <i>auricampa</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus lesouefii</i>				
<i>Eremophila parvifolia</i> subsp. <i>auricampa</i>				
<i>Olearia muelleri</i>				
<i>Eremophila glabra</i>				
<i>Senna artemisioides</i> subsp. <i>petiolaris</i>				
<i>Cratystylis conocephala</i>				
<i>Eremophila scoparia</i>				
<i>Eremophila interstans</i>				
<i>Eucalyptus salubris</i>				
<i>Eucalyptus salmonophloia</i>				

<b>Site:</b>	RS008	<b>Type:</b>	Relevé (20 m x 20 m)
<b>Date(s):</b>	08 November 2016	<b>Position:</b>	-31.511574, 121.816336
<b>Total vegetation cover (%):</b>	15	<b>Topography:</b>	hill top
<b>Tree/shrub cover &gt;2 m (%):</b>	10	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	5	<b>Soil:</b>	gravel / alluvial, sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus lesouefii</i> , <i>E. salubris</i> and <i>E. celastroides</i> subsp. <i>celastroides</i> woodland over mid open <i>Eremophila scoparia</i> and <i>Halgania andromedifolia</i> shrubland over sparse low <i>Scaevola spinescens</i> and <i>Westringia cephalantha</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i>	03.0	10.00		
<i>Eremophila psilocalyx</i>	00.1	01.20		
<i>Westringia cephalantha</i>				
<i>Scaevola spinescens</i>				
<i>Halgania andromedifolia</i>				
<i>Eremophila scoparia</i>				
<i>Eucalyptus salubris</i>				
<i>Eucalyptus lesouefii</i>				



<b>Site:</b>	RS009	<b>Type:</b>	Relevé (20 m x 20 m)
<b>Date(s):</b>	08 November 2016	<b>Position:</b>	-31.508698, 121.82833
<b>Total vegetation cover (%):</b>	25	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	17	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	sandy clay, sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus salubris</i> , <i>E. salmonophloia</i> woodland over sparse tall <i>Eremophila interstans</i> shrubland over mid open <i>Atriplex nummularia</i> , <i>Tecticornia disarticulata</i> and <i>Senna artemisioides</i> subsp. <i>petiolaris</i> shrubland over sparse low <i>Olearia muelleri</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus salubris</i>				
<i>Olearia muelleri</i>				
<i>Senna artemisioides</i> subsp. <i>petiolaris</i>				
<i>Tecticornia disarticulata</i>				
<i>Atriplex nummularia</i>				
<i>Eremophila interstans</i>				
<i>Eucalyptus salmonophloia</i>				

<b>Site:</b>	RS010	<b>Type:</b>	Relevé (20 m x 20 m)
<b>Date(s):</b>	08 November 2016	<b>Position:</b>	-31.499201, 121.838094
<b>Total vegetation cover (%):</b>	30	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	0	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	0	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus salubris</i> , <i>E. lesouefii</i> and <i>E. salmonophloia</i> woodland over tall sparse <i>Eremophila scoparia</i> shrubland over low <i>Cratystylis conocephala</i> , <i>Maireana sedifolia</i> , <i>Atriplex vesicaria</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Atriplex vesicaria</i>	04.0	00.40		
<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>	01.0	12.00		
<i>Maireana sedifolia</i>				
<i>Cratystylis conocephala</i>				
<i>Eremophila scoparia</i>				
<i>Eucalyptus salmonophloia</i>				
<i>Eucalyptus lesouefii</i>				
<i>Eucalyptus salubris</i>				

<b>Site:</b>	RS011	<b>Type:</b>	Relevé (20 m x 20 m)
<b>Date(s):</b>	08 November 2016	<b>Position:</b>	-31.490027, 121.835852
<b>Total vegetation cover (%):</b>	40	<b>Topography:</b>	hill top
<b>Tree/shrub cover &gt;2 m (%):</b>	25	<b>Soil colour:</b>	brown
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	gravel / alluvial, sandy loam, loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	granite rocks
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus torquata</i> and <i>E. lesouefii</i> woodland over tall open <i>Melaleuca sheathiana</i> , <i>Santalum acuminatum</i> , and <i>Alyxia buxifolia</i> shrubland over mid open <i>Scaevola spinescens</i> , <i>Halgania andromedifolia</i> , <i>Cratystylis conocephala</i> shrubland over sparse low <i>Westringia cephalantha</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus torquata</i>				
<i>Westringia cephalantha</i>				
<i>Cratystylis conocephala</i>				
<i>Halgania andromedifolia</i>				
<i>Scaevola spinescens</i>				
<i>Alyxia buxifolia</i>				
<i>Santalum acuminatum</i>				
<i>Melaleuca sheathiana</i>				
<i>Eucalyptus lesouefii</i>				



<b>Site:</b>	RS012	<b>Type:</b>	Relevé (20 m x 20 m)
<b>Date(s):</b>	08 November 2016	<b>Position:</b>	-31.484364, 121.833819
<b>Total vegetation cover (%):</b>	45	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	20	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	25	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus lesouefii</i> and <i>E. transcontinentalis</i> woodland over tall open <i>Eremophila ionantha</i> , <i>E. interstans</i> and <i>Santalum acuminatum</i> shrubland over mid open <i>Scaevola spinescens</i> and <i>Alyxia buxifolia</i> shrubland over sparse low <i>Westringia cephalantha</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus transcontinentalis</i>	07.0	10.00		
<i>Westringia cephalantha</i>				
<i>Alyxia buxifolia</i>				
<i>Scaevola spinescens</i>				
<i>Santalum acuminatum</i>				
<i>Eremophila interstans</i>				
<i>Eremophila ionantha</i>				
<i>Eucalyptus lesouefii</i>				

<b>Site:</b>	RS013	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	08 November 2016	<b>Position:</b>	-31.490082, 121.815528
<b>Total vegetation cover (%):</b>	35	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	15	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus lesouefii</i> and <i>E. oleosa</i> subsp. <i>oleosa</i> woodland over tall open <i>Melaleuca sheathiana</i> , <i>Eremophila interstans</i> and <i>Santalum acuminata</i> shrubland over mid open <i>Cratystylis conocephala</i> , <i>Scaevola spinescens</i> and <i>Senna artemisioides</i> subsp. <i>petiolaris</i> shrubland over sparse low <i>Westringia cephalantha</i> , <i>Olearia muelleri</i> and <i>Ptilotus obovatus</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>	05.0	10.00		
<i>Ptilotus obovatus</i>				
<i>Olearia muelleri</i>				
<i>Westringia cephalantha</i>				
<i>Senna artemisioides</i> subsp. <i>petiolaris</i>				
<i>Scaevola spinescens</i>				
<i>Cratystylis conocephala</i>				
<i>Santalum acuminatum</i>				
<i>Eremophila interstans</i>				
<i>Melaleuca sheathiana</i>				
<i>Eucalyptus lesouefii</i>				

<b>Site:</b>	RS014	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	08 November 2016	<b>Position:</b>	-31.491415, 121.909113
<b>Total vegetation cover (%):</b>	30	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	18	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	12	<b>Soil:</b>	gravel / alluvial, sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus salmonophloia</i> and <i>E. transcontinentalis</i> woodland over tall open <i>Eremophila ionantha</i> and <i>E. scoparia</i> shrubland over mid open <i>Cratystylis conocephala</i> and <i>Atriplex nummularia</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus transcontinentalis</i>	07.0	12.00		
<i>Atriplex nummularia</i>				
<i>Cratystylis conocephala</i>				
<i>Eremophila scoparia</i>				
<i>Eremophila ionantha</i>				
<i>Eucalyptus salmonophloia</i>				



<b>Site:</b>	RS015	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	08 November 2016	<b>Position:</b>	-31.461691, 121.946057
<b>Total vegetation cover (%):</b>	40	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	25	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	15	<b>Soil:</b>	sandy loam, clay
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus celastroides</i> subsp. <i>celastroides</i> , <i>E. lesouefii</i> and <i>E. salmonophloia</i> woodland over tall open <i>Melaleuca sheathiana</i> , <i>Eremophila interstans</i> and <i>E. scoparia</i> shrubland over mid open <i>Cratystylis conocephala</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i>				
<i>Cratystylis conocephala</i>				
<i>Eremophila scoparia</i>				
<i>Eremophila interstans</i>				
<i>Melaleuca sheathiana</i>				
<i>Eucalyptus salmonophloia</i>				
<i>Eucalyptus lesouefii</i>				

<b>Site:</b>	RS016	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	08 November 2016	<b>Position:</b>	-31.461719, 121.946047
<b>Total vegetation cover (%):</b>	35	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	20	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	15	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus lesoueffi</i> and <i>E. stricklandii</i> woodland over tall open <i>Melaleuca sheathiana</i> , <i>Eremophila interstans</i> and <i>E. scoparia</i> shrubland over mid open <i>Eremophila ionantha</i> , <i>Cratystylis conocephala</i> and <i>Atriplex nummularia</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus stricklandii</i>	07.0	12.00		
<i>Atriplex nummularia</i>				
<i>Cratystylis conocephala</i>				
<i>Eremophila ionantha</i>				
<i>Eremophila scoparia</i>				
<i>Eremophila interstans</i>				
<i>Melaleuca sheathiana</i>				
<i>Eucalyptus lesoueffi</i>				

<b>Site:</b>	RS017	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	08 November 2016	<b>Position:</b>	-31.463789, 121.925419
<b>Total vegetation cover (%):</b>	35	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	20	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid open <i>Eucalyptus lesouefii</i> , <i>E. salmonophloia</i> and <i>E. torquata</i> woodland over sparse tall <i>Melaleuca sheathiana</i> , <i>Eremophila interstans</i> and <i>E. scoparia</i> shrubland over mid open <i>Atriplex vesicaria</i> , <i>A. nummularia</i> and <i>Cratystylis conocephala</i> shrubland over sparse low <i>Olearia muelleri</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus lesouefii</i>				
<i>Olearia muelleri</i>				
<i>Cratystylis conocephala</i>				
<i>Atriplex nummularia</i>				
<i>Atriplex vesicaria</i>				
<i>Eremophila scoparia</i>				
<i>Eremophila interstans</i>				
<i>Melaleuca sheathiana</i>				
<i>Eucalyptus torquata</i>				
<i>Eucalyptus salmonophloia</i>				

<b>Site:</b>	RS018	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	08 November 2016	<b>Position:</b>	-31.462719, 121.911468
<b>Total vegetation cover (%):</b>	35	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	15	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	sandy loam, clay
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus salubris</i> and <i>E. salmonophloia</i> woodland over tall sparse <i>Eremophila dempsteri</i> and <i>E. scoparia</i> shrubland over mid open <i>Atriplex vesicaria</i> , <i>A. numularia</i> shrubland over sparse low <i>Ptilotus obovatus</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eremophila dempsteri</i>	08.0	02.50		
<i>Angianthus tomentosus</i>	00.1	00.10		
<i>Erymophyllum ramosum</i> subsp. <i>ramosum</i>	00.1	00.10		
<i>Ptilotus obovatus</i>				
<i>Atriplex nummularia</i>				
<i>Atriplex vesicaria</i>				
<i>Eremophila scoparia</i>				
<i>Eucalyptus salmonophloia</i>				
<i>Eucalyptus salubris</i>				



<b>Site:</b>	RS019	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	08 November 2016	<b>Position:</b>	-31.462655, 121.903035
<b>Total vegetation cover (%):</b>	30	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	10	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	gravel / alluvial, loam, clay loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	Ironstone?
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus salmonophloia</i> woodland over sparse tall <i>Eremophila drummondii</i> and <i>Exocarpos aphyllus</i> shrubland over mid <i>Atriplex vesicaria</i> , <i>A. nummularia</i> and <i>Maireana sedifolia</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eremophila drummondii</i>	02.0	02.00		
<i>Maireana sedifolia</i>				
<i>Atriplex nummularia</i>				
<i>Atriplex vesicaria</i>				
<i>Exocarpos aphyllus</i>				
<i>Eucalyptus salmonophloia</i>				

<b>Site:</b>	RS020	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	10 November 2016	<b>Position:</b>	-31.476349, 121.891324
<b>Total vegetation cover (%):</b>	40	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	15	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	25	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus salubris</i> and <i>E. lesouefii</i> woodland over tall open <i>Eremophila interstans</i> and <i>E. scoparia</i> shrubland over mid open <i>Cratystylis conocephala</i> , <i>Atriplex nummularia</i> and <i>Atriplex bunburyana</i> shrubland over sparse low <i>Olearia muelleri</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus salubris</i>				
<i>Olearia muelleri</i>				
<i>Atriplex bunburyana</i>				
<i>Atriplex nummularia</i>				
<i>Cratystylis conocephala</i>				
<i>Eremophila scoparia</i>				
<i>Eremophila interstans</i>				
<i>Eucalyptus lesouefii</i>				

<b>Site:</b>	RS021	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	10 November 2016	<b>Position:</b>	-31.492081, 121.890568
<b>Total vegetation cover (%):</b>	50	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	15	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	35	<b>Soil:</b>	sandy clay
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Excellent, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus salmonophloia</i> woodland over mid open <i>Eremophila drummondii</i> shrubland over low <i>Eremophila decipiens</i> , <i>Atriplex vesicaria</i> and <i>A. nummularia</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eremophila ionantha</i>	00.1	00.40		
<i>Diocirea acutifolia</i>	00.1	00.50		P3 (WC Act)
<i>Atriplex nummularia</i>				
<i>Atriplex vesicaria</i>				
<i>Eremophila decipiens</i>				
<i>Eremophila drummondii</i>				
<i>Eucalyptus salmonophloia</i>				

<b>Site:</b>	RS022	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	10 November 2016	<b>Position:</b>	-31.497693, 121.872648
<b>Total vegetation cover (%):</b>	45	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	30	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	sandy loam, clay
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus ravida</i> , <i>E. celastroides</i> subsp. <i>celastroides</i> and <i>E. lesouefii</i> woodland over tall open <i>Eremophila dempsteri</i> , <i>E. scoparia</i> and <i>Santalum acuminatum</i> shrubland over mid open <i>Maireana sedifolia</i> , <i>Atriplex vesicaria</i> and <i>A. nummularia</i> over low isolated <i>Olearia muelleri</i> shrubs.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i>	05.0	10.00		
<i>Olearia muelleri</i>				
<i>Atriplex nummularia</i>				
<i>Atriplex vesicaria</i>				
<i>Maireana sedifolia</i>				
<i>Santalum acuminatum</i>				
<i>Eremophila scoparia</i>				
<i>Eremophila dempsteri</i>				
<i>Eucalyptus lesouefii</i>				
<i>Eucalyptus ravida</i>				



<b>Site:</b>	RS024	<b>Type:</b>	Quadrat (20 m x 20 m)
<b>Date(s):</b>	11 November 2016	<b>Position:</b>	-31.498534, 121.961853
<b>Total vegetation cover (%):</b>	0	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	40	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	gravel / alluvial, sandy loam
<b>Grass cover (%):</b>	25	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus salmonophloia</i> , <i>E. lesouefii</i> , <i>E. ravida</i> and <i>E. celastroides</i> subsp. <i>celastroides</i> woodland over tall open <i>Eremophila interstans</i> , <i>E. scoparia</i> and <i>E. drummondii</i> shrubland over low open <i>Atriplex vesicaria</i> and <i>A. nummularia</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Atriplex vesicaria</i>	10.0	00.50		
<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i>	06.0	10.00		
<i>Eucalyptus lesouefii</i>	06.0	12.00		
<i>Atriplex nummularia</i>	06.0	01.20		
<i>Eremophila interstans</i>	05.0	02.20		
<i>Eucalyptus salmonophloia</i>	03.0	12.00		
<i>Eucalyptus ravida</i>	03.0	10.00		
<i>Eremophila scoparia</i>	02.0	03.00		
<i>Eremophila drummondii</i>	02.0	01.80		
<i>Maireana sedifolia</i>	02.0	00.50		
<i>Exocarpos aphyllus</i>	01.0	01.80		
<i>Maireana tomentosa</i> subsp. <i>tomentosa</i>	00.1	00.15		
<i>Maireana triptera</i>	00.1	00.20		
<i>Sclerolaena fusiformis</i>	00.1	00.10		
<i>Enchylaena tomentosa</i>	00.1	00.50		
<i>Santalum acuminatum</i>	00.1	01.20		
<i>Pimelea microcephala</i>	00.1	01.40		
<i>Sclerolaena diacantha</i>	00.1	00.15		
<i>Ptilotus obovatus</i>	00.1	00.40		

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<i>Eremophila decipiens</i> subsp. <i>decipiens</i>	00.1	00.50
<i>Olearia muelleri</i>	00.1	00.50
<i>Rhagodia drummondii</i>	00.1	00.50
<i>Senna artemisioides</i> subsp. <i>petiolaris</i>	00.1	00.60

<b>Site:</b>	RS025	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	11 November 2016	<b>Position:</b>	-31.497927, 121.955044
<b>Total vegetation cover (%):</b>	20	<b>Topography:</b>	hill slope
<b>Tree/shrub cover &gt;2 m (%):</b>	17	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	3	<b>Soil:</b>	gravel / alluvial, sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus lesoueffii</i> , <i>E. salmonophloia</i> and <i>E.urna</i> woodland over tall sparse <i>Melaleuca sheathiana</i> shrubland over mid sparse <i>Scaevola spinescens</i> and <i>Atriplex nummularia</i> shrubland over low sparse <i>Tecticornia disarticulata</i> chenopod shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus urna</i>	08.0	12.00		
<i>Tecticornia disarticulata</i>				
<i>Atriplex nummularia</i>				
<i>Scaevola spinescens</i>				
<i>Melaleuca sheathiana</i>				
<i>Eucalyptus salmonophloia</i>				
<i>Eucalyptus lesoueffii</i>				

<b>Site:</b>	RS026	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	11 November 2016	<b>Position:</b>	-31.497958, 121.929725
<b>Total vegetation cover (%):</b>	40	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	25	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	15	<b>Soil:</b>	gravel / alluvial, sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus salmonophloia</i> , <i>E. transcontinentalis</i> , <i>E. celastroides</i> subsp. <i>celastroides</i> and <i>E. urna</i> woodland over tall open <i>Melaleuca sheathiana</i> , <i>Eremophila interstans</i> and <i>Exocarpos aphyllus</i> shrubland over mid open <i>Eremophila scoparia</i> and <i>Halgania andromedifolia</i> shrubland over isolated low <i>Eremophila parvifolia</i> subsp. <i>auricampa</i> shrubs.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus transcontinentalis</i>	08.0	12.00		
<i>Eremophila parvifolia</i> subsp. <i>auricampa</i>				
<i>Halgania andromedifolia</i>				
<i>Eremophila scoparia</i>				
<i>Exocarpos aphyllus</i>				
<i>Eremophila interstans</i>				
<i>Melaleuca sheathiana</i>				
<i>Eucalyptus urna</i>				
<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i>				
<i>Eucalyptus salmonophloia</i>				



<b>Site:</b>	RS027	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	11 November 2016	<b>Position:</b>	-31.498144, 121.915962
<b>Total vegetation cover (%):</b>	30	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	15	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	gravel / alluvial, sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus stricklandii</i> and <i>E. celastroides</i> subsp. <i>celastroides</i> woodland over tall open <i>Eremophila psilocalyx</i> and <i>Alyxia buxifolia</i> shrubland over mid open <i>Eremophila drummondii</i> , <i>Halgania andromedifolia</i> and <i>Scaevola spinescens</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus stricklandii</i>				
<i>Scaevola spinescens</i>				
<i>Halgania andromedifolia</i>				
<i>Eremophila drummondii</i>				
<i>Alyxia buxifolia</i>				
<i>Eremophila psilocalyx</i>				
<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i>				

<b>Site:</b>	RS029	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	11 November 2016	<b>Position:</b>	-31.563518, 121.894222
<b>Total vegetation cover (%):</b>	15	<b>Topography:</b>	breakaway
<b>Tree/shrub cover &gt;2 m (%):</b>	12	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	5	<b>Soil:</b>	laterite
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Low open <i>Eucalyptus stricklandii</i> woodland over tall sparse <i>Acacia tetragonophylla</i> and <i>Alyxia buxifolia</i> shrubland over sparse mid <i>Dodonaea lobulata</i> shrubland over low sparse <i>Calytrix tetragona</i> , <i>Prostanthera splendens</i> and <i>Ptilotus helichrysoides</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus stricklandii</i>	10.0	10.00		
<i>Calytrix tetragona</i>	03.0	00.30		
<i>Prostanthera splendens</i>	01.0	00.40		P1 (WC Act)
<i>Ptilotus helichrysoides</i>	00.2	00.10		
<i>Isotoma petraea</i>		00.20		
<i>Dodonaea lobulata</i>				
<i>Alyxia buxifolia</i>				
<i>Acacia tetragonophylla</i>				

<b>Site:</b>	RS030	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	11 November 2016	<b>Position:</b>	-31.620302, 121.79817
<b>Total vegetation cover (%):</b>	35	<b>Topography:</b>	hill slope
<b>Tree/shrub cover &gt;2 m (%):</b>	20	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	sandy loam, clay
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus salmonophloia</i> , <i>E. celastroides</i> subsp. <i>celastroides</i> , <i>E. lesouefii</i> and <i>E. ravida</i> woodland over tall sparse <i>Eremophila dempsteri</i> and <i>Santalum acuminata</i> shrubland over mid open <i>Cratystylis conocephala</i> , <i>Atriplex nummularia</i> and <i>Maireana sedifolia</i> shrubland over low open <i>Diocerea acutifolia</i> and <i>Nitraria billardierei</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Nitraria billardierei</i>	03.0	00.50		
<i>Diocerea acutifolia</i>				P3 (WC Act)
<i>Maireana sedifolia</i>				
<i>Atriplex nummularia</i>				
<i>Cratystylis conocephala</i>				
<i>Santalum acuminatum</i>				
<i>Eremophila dempsteri</i>				
<i>Eucalyptus ravida</i>				
<i>Eucalyptus lesouefii</i>				
<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i>				
<i>Eucalyptus salmonophloia</i>				

<b>Site:</b>	RS031	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	11 November 2016	<b>Position:</b>	-31.611791, 121.879465
<b>Total vegetation cover (%):</b>	20	<b>Topography:</b>	drainage line
<b>Tree/shrub cover &gt;2 m (%):</b>	3	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	sandy clay
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Excellent, Keighery (1994)		
<b>Vegetation description:</b>	Mid open <i>Eucalyptus lesouefii</i> and <i>E. salmonophloia</i> woodland over mid sparse <i>Eremophila scoparia</i> and <i>Atriplex nummularia</i> shrubland over low open <i>Atriplex vesicaria</i> , <i>Maireana sedifolia</i> , <i>Cratystylis subspinescens</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Calandrinia</i> sp. intergrade	00.1	00.20		
<i>Cratystylis subspinescens</i>				
<i>Maireana sedifolia</i>				
<i>Atriplex vesicaria</i>				
<i>Atriplex nummularia</i>				
<i>Eremophila scoparia</i>				
<i>Eucalyptus salmonophloia</i>				
<i>Eucalyptus lesouefii</i>				



<b>Site:</b>	RS032	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	11 November 2016	<b>Position:</b>	-31.601904, 121.85377
<b>Total vegetation cover (%):</b>	65	<b>Topography:</b>	hill slope
<b>Tree/shrub cover &gt;2 m (%):</b>	40	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	30	<b>Soil:</b>	gravel / alluvial, clay, rocks
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	granite rocks
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Low open <i>Eucalyptus oleosa</i> subsp. <i>oleosa</i> woodland over tall open <i>Acacia burkittii</i> , <i>Acacia quadrimarginea</i> and <i>Santalum acuminata</i> shrubland over low <i>Hybanthus floribundus</i> and <i>Dodonaea coriacea</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Hybanthus floribundus</i> subsp. <i>curvifolius</i>	20.0	00.70		
<i>Dodonaea microzyga</i> var. <i>acrolobata</i>	15.0	00.80		
<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>	07.0	08.00		
<i>Dodonaea coriacea</i>				
<i>Santalum acuminatum</i>				
<i>Acacia quadrimarginea</i>				
<i>Acacia burkittii</i>				

<b>Site:</b>	RS033	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	11 November 2016	<b>Position:</b>	-31.606115, 121.853785
<b>Total vegetation cover (%):</b>	50	<b>Topography:</b>	hill top
<b>Tree/shrub cover &gt;2 m (%):</b>	35	<b>Soil colour:</b>	brown
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus torquata</i> and <i>E. oleosa</i> subsp. <i>oleosa</i> woodland over tall sparse <i>Acacia quadrimarginea</i> and <i>Allocasuarina helmsii</i> shrubland over mid open <i>Halgania andromedifolia</i> and <i>Trymalium ? myrtilus</i> subsp. <i>myrtilus</i> shrubland over isolated low <i>Westringia cephalantha</i> shrubs.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Trymalium ? myrtilus</i> subsp. <i>myrtilus</i>	18.0	01.80		
<i>Allocasuarina helmsii</i>	05.0	03.00		
<i>Westringia cephalantha</i>				
<i>Halgania andromedifolia</i>				
<i>Acacia quadrimarginea</i>				
<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>				
<i>Eucalyptus torquata</i>				

<b>Site:</b>	RS034	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	11 November 2016	<b>Position:</b>	-31.626264, 121.817666
<b>Total vegetation cover (%):</b>	60	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	0	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	0	<b>Soil:</b>	sandy loam, clay
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus lesouefii</i> and <i>E. salmonophloia</i> woodland over tall open <i>Alyxia buxifolia</i> , <i>Santalum acuminata</i> , and <i>Eremophila scoparia</i> shrubland over mid <i>Dodonaea lobulata</i> , <i>Cratystylis conocephala</i> and <i>Eremophila glabra</i> shrubland over low open <i>Westringia cephalantha</i> and <i>Atriplex vesicaria</i> shrubland over isolated low <i>Austrostipa elegantissima</i> tussock grasses.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus lesouefii</i>				
<i>Austrostipa elegantissima</i>				
<i>Atriplex vesicaria</i>				
<i>Westringia cephalantha</i>				
<i>Eremophila glabra</i>				
<i>Cratystylis conocephala</i>				
<i>Dodonaea lobulata</i>				
<i>Eremophila scoparia</i>				
<i>Santalum acuminatum</i>				
<i>Alyxia buxifolia</i>				
<i>Eucalyptus salmonophloia</i>				

<b>Site:</b>	RS035	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	11 November 2016	<b>Position:</b>	-31.632142, 121.815168
<b>Total vegetation cover (%):</b>	40	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	25	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	gravel / alluvial, sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus ravida</i> woodland over mid open <i>Eremophila dempsteri</i> and <i>Santalum acuminata</i> shrubland over low open <i>Atriplex bunburyana</i> and <i>Diocerea acutifolia</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus ravida</i>				
<i>Diocerea acutifolia</i>				P3 (WC Act)
<i>Atriplex bunburyana</i>				
<i>Santalum acuminatum</i>				
<i>Eremophila dempsteri</i>				



<b>Site:</b>	RS036	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	11 November 2016	<b>Position:</b>	-31.641806, 121.828238
<b>Total vegetation cover (%):</b>	50	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	35	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	25	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus oleosa</i> subsp. <i>oleosa</i> and <i>E. urna</i> woodland over tall open <i>Melaleuca sheathiana</i> , <i>Alyxia buxifolia</i> and <i>Santalum acuminata</i> shrubland over mid open <i>Scaevola spinescens</i> and <i>Halgania andromedifolia</i> over low open <i>Eremophila clavata</i> and <i>Westringia cephalantha</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>	12.0	10.00		
<i>Eremophila clavata</i>	03.0	01.00		
<i>Eremophila oblonga</i>	00.1	00.70		
<i>Schismus arabicus</i>	00.1	00.05	*	
<i>Westringia cephalantha</i>				
<i>Halgania andromedifolia</i>				
<i>Scaevola spinescens</i>				
<i>Santalum acuminatum</i>				
<i>Alyxia buxifolia</i>				
<i>Melaleuca sheathiana</i>				
<i>Eucalyptus urna</i>				

<b>Site:</b>	RS037	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	11 November 2016	<b>Position:</b>	-31.592831, 121.773686
<b>Total vegetation cover (%):</b>	40	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	15	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	30	<b>Soil:</b>	gravel / alluvial, sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus salmonophloia</i> , <i>E. celastroides</i> subsp. <i>celastroides</i> and <i>E. lesouefii</i> woodland over tall sparse <i>Alyxia buxifolia</i> , <i>Eremophila ionantha</i> and <i>E. scoparia</i> tall shrubland over mid open <i>Dodonaea lobulata</i> , <i>Halgania andromedifolia</i> and <i>Scaevola spinescens</i> shrubland over low sparse <i>Westringia cephalantha</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus salmonophloia</i>				
<i>Westringia cephalantha</i>				
<i>Scaevola spinescens</i>				
<i>Halgania andromedifolia</i>				
<i>Dodonaea lobulata</i>				
<i>Eremophila scoparia</i>				
<i>Eremophila ionantha</i>				
<i>Alyxia buxifolia</i>				
<i>Eucalyptus lesouefii</i>				
<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i>				

<b>Site:</b>	RS038	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	12 November 2016	<b>Position:</b>	-31.538444, 121.516712
<b>Total vegetation cover (%):</b>	50	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	35	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus salubris</i> , <i>E. salmonophloia</i> , <i>E. celastroides</i> subsp. <i>virella</i> and <i>E. transcontinentalis</i> woodland over tall sparse <i>Melaleuca pauperiflora</i> subsp. <i>fastigiata</i> and <i>Eremophila scoparia</i> shrubland over mid open <i>Acacia hemiteles</i> , <i>Eremophila ionantha</i> and <i>Scaevola spinescens</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus celastroides</i> subsp. <i>virella</i>	10.0	12.00		
<i>Melaleuca pauperiflora</i> subsp. <i>fastigiata</i>	05.0	05.00		
<i>Eucalyptus transcontinentalis</i>	02.0	06.00		
<i>Ptilotus drummondii</i>	00.1	00.05		
<i>Scaevola spinescens</i>				
<i>Eremophila ionantha</i>				
<i>Acacia hemiteles</i>				
<i>Eremophila scoparia</i>				
<i>Eucalyptus salmonophloia</i>				
<i>Eucalyptus salubris</i>				

<b>Site:</b>	RS039	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	12 November 2016	<b>Position:</b>	-31.53531, 121.510204
<b>Total vegetation cover (%):</b>	50	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	30	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	30	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Low <i>Eucalyptus cylindrocarpa</i> and <i>E. yilgarnensis</i> woodland over tall open <i>Melaleuca sheathiana</i> shrubland over mid open <i>Eremophila ionantha</i> , <i>E. scoparia</i> and <i>Santalum acuminatum</i> tshrubland over low sparse <i>Acacia merrallii</i> and <i>Eremophila ionantha</i> shrubland over low sparse <i>Triodia ? irritans</i> hummock grassland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus yilgarnensis</i>	15.0	08.00		
<i>Eucalyptus cylindrocarpa</i>	15.0	08.00		
<i>Triodia ? irritans</i>	07.0	00.30		
<i>Acacia merrallii</i>	03.0	00.30		
<i>Santalum acuminatum</i>				
<i>Eremophila scoparia</i>				
<i>Eremophila ionantha</i>				
<i>Melaleuca sheathiana</i>				



<b>Site:</b>	RS040	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	12 November 2016	<b>Position:</b>	-31.533358, 121.505753
<b>Total vegetation cover (%):</b>	50	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	25	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	30	<b>Soil:</b>	sandy clay, loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus griffithsii</i> , <i>E. yilgarnensis</i> and <i>E. cylindrocarpa</i> mallee woodland over tall <i>Exocarpos aphyllus</i> and <i>Santalum acuminata</i> shrubland over low <i>Acacia merrallii</i> , <i>Eremophila caerulea</i> subsp. <i>caerulea</i> and <i>Olearia muelleri</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus griffithsii</i>	15.0	07.00		
<i>Eremophila caerulea</i> subsp. <i>caerulea</i>	10.0	00.30		
<i>Dillwynia</i> sp. Coolgardie (V.E. Sands 637.3.1)	00.1	00.30		
<i>Olearia muelleri</i>				
<i>Acacia merrallii</i>				
<i>Santalum acuminatum</i>				
<i>Exocarpos aphyllus</i>				
<i>Eucalyptus cylindrocarpa</i>				
<i>Eucalyptus yilgarnensis</i>				

<b>Site:</b>	RS041	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	12 November 2016	<b>Position:</b>	-31.530555, 121.499498
<b>Total vegetation cover (%):</b>	60	<b>Topography:</b>	hill slope
<b>Tree/shrub cover &gt;2 m (%):</b>	55	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	10	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Low <i>Eucalyptus lesoueffii</i> and <i>E. celastroides</i> subsp. <i>virella</i> woodland over tall open <i>Eremophila caperata</i> and <i>Melaleuca pauperiflora</i> subsp. <i>fastigiata</i> shrubland over low sparse <i>Westringia cephalantha</i> var. <i>cephalantha</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus celastroides</i> subsp. <i>virella</i>	15.0	10.00		
<i>Eremophila caperata</i>	12.0	02.20		
<i>Melaleuca pauperiflora</i> subsp. <i>fastigiata</i>	07.0	03.00		
<i>Westringia cephalantha</i> var. <i>cephalantha</i>	03.0	01.00		
<i>Eucalyptus lesoueffii</i>				

<b>Site:</b>	RS042	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	12 November 2016	<b>Position:</b>	-31.511951, 121.487365
<b>Total vegetation cover (%):</b>	60	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	40	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	25	<b>Soil:</b>	sandy clay, loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus lesouefii</i> and <i>E. urna</i> woodland over tall open <i>Melaleuca sheathiana</i> , <i>Eremophila caperata</i> and <i>Alyxia buxifolia</i> shrubland over mid open <i>Acacia hemiteles</i> , <i>Eremophila scoparia</i> and <i>Senna artemisioides</i> subsp. <i>petiolaris</i> shrubland over low open <i>Eremophila caerulea</i> subsp. <i>caerulea</i> and <i>Westringia cephalantha</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus urna</i>	15.0	12.00		
<i>Westringia cephalantha</i>				
<i>Eremophila caerulea</i> subsp. <i>caerulea</i>				
<i>Senna artemisioides</i> subsp. <i>petiolaris</i>				
<i>Eremophila scoparia</i>				
<i>Acacia hemiteles</i>				
<i>Alyxia buxifolia</i>				
<i>Eremophila caperata</i>				
<i>Melaleuca sheathiana</i>				
<i>Eucalyptus lesouefii</i>				

<b>Site:</b>	RS043	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	12 November 2016	<b>Position:</b>	-31.110093, 121.587369
<b>Total vegetation cover (%):</b>	50	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	20	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	40	<b>Soil:</b>	gravel / alluvial, sandy clay, loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus celastroides</i> subsp. <i>celastroides</i> , <i>E. ravida</i> , <i>E. salmonophloia</i> and <i>E. stricklandii</i> woodland over tall open <i>Eremophila interstans</i> and <i>Santalum acuminata</i> shrubland over mid open <i>Atriplex nummulari</i> and <i>Eremophila drummondii</i> shrubland over sparse low <i>Olearia mueleri</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eremophila interstans</i> subsp. <i>interstans</i>	30.0	02.20		
<i>Eremophila drummondii</i>	10.0	01.20		
<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i>	05.0	10.00		
<i>Olearia mueleri</i>				
<i>Atriplex nummularia</i>				
<i>Santalum acuminatum</i>				
<i>Eremophila interstans</i>				
<i>Eucalyptus stricklandii</i>				
<i>Eucalyptus salmonophloia</i>				
<i>Eucalyptus ravida</i>				



<b>Site:</b>	RS044	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	12 November 2016	<b>Position:</b>	-31.1102, 121.582625
<b>Total vegetation cover (%):</b>	0	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	0	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	0	<b>Soil:</b>	gravel / alluvial, sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus celastroides</i> subsp. <i>celastroides</i> , <i>E. ravida</i> and <i>E. salmonophloia</i> woodland over tall sparse <i>Melaleuca sheathiana</i> shrubland over mid open <i>Atriplex nummularia</i> , <i>Eremophila scoparia</i> and <i>Maireana sedifolia</i> shrubland over isolated low <i>Olearia muelleri</i> shrubs.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i>				
<i>Olearia muelleri</i>				
<i>Maireana sedifolia</i>				
<i>Eremophila scoparia</i>				
<i>Atriplex nummularia</i>				
<i>Melaleuca sheathiana</i>				
<i>Eucalyptus salmonophloia</i>				
<i>Eucalyptus ravida</i>				

<b>Site:</b>	RS045	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	12 November 2016	<b>Position:</b>	-31.18133, 121.618944
<b>Total vegetation cover (%):</b>	40	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	25	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	gravel / alluvial, sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i> , <i>E. salmonophloia</i> and <i>E. transcontinentalis</i> woodland over tall open <i>Melaleuca sheathiana</i> , <i>Santalum acuminata</i> and <i>Eremophila scoparia</i> shrubland over mid <i>Maireana sedifolia</i> and <i>Senna artemisioides</i> subsp. <i>petiolaris</i> shrubland over low open <i>Eremophila parvifolia</i> subsp. <i>auricampa</i> and <i>Olearia muelleri</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i>	10.0	12.00		
<i>Eucalyptus transcontinentalis</i>	07.0	10.00		
<i>Olearia muelleri</i>				
<i>Eremophila parvifolia</i> subsp. <i>auricampa</i>				
<i>Senna artemisioides</i> subsp. <i>petiolaris</i>				
<i>Maireana sedifolia</i>				
<i>Eremophila scoparia</i>				
<i>Santalum acuminatum</i>				
<i>Melaleuca sheathiana</i>				
<i>Eucalyptus salmonophloia</i>				

<b>Site:</b>	RS046	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	12 November 2016	<b>Position:</b>	-31.222315, 121.561846
<b>Total vegetation cover (%):</b>	40	<b>Topography:</b>	hill top
<b>Tree/shrub cover &gt;2 m (%):</b>	25	<b>Soil colour:</b>	brown
<b>Shrub cover &lt;2 m (%):</b>	25	<b>Soil:</b>	gravel / alluvial, sandy loam, rocks
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	granite outcropping
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus torquata</i> and <i>E. salmonophloia</i> woodland over tall open <i>Acacia quadrimarginea</i> , <i>Eremophila interstans</i> and <i>Eremophila oldfieldii</i> shrubland over mid open <i>Dodonaea lobulata</i> , <i>Exocarpos aphyllus</i> and <i>Scaevola spinescens</i> shrubland over low isolated <i>Ptilotus obovatus</i> shrubs.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus torquata</i>				
<i>Ptilotus obovatus</i>				
<i>Scaevola spinescens</i>				
<i>Exocarpos aphyllus</i>				
<i>Dodonaea lobulata</i>				
<i>Eremophila oldfieldii</i>				
<i>Eremophila interstans</i>				
<i>Acacia quadrimarginea</i>				
<i>Eucalyptus salmonophloia</i>				

<b>Site:</b>	RS047	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	12 November 2016	<b>Position:</b>	-31.215753, 121.591264
<b>Total vegetation cover (%):</b>	45	<b>Topography:</b>	drainage line
<b>Tree/shrub cover &gt;2 m (%):</b>	25	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	25	<b>Soil:</b>	sandy clay
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Excellent, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus lesouefii</i> , <i>E. griffithsii</i> and <i>E. salmonophloia</i> woodland over tall open <i>Acacia jennerae</i> , <i>Exocarpos aphyllus</i> and <i>Santalum acuminata</i> shrubland over low <i>Lycium australe</i> , <i>Eremophila drummondii</i> and <i>Senna artemisioides</i> subsp. <i>petiolaris</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus griffithsii</i>	07.0	10.00		
<i>Senna artemisioides</i> subsp. <i>petiolaris</i>				
<i>Eremophila drummondii</i>				
<i>Lycium australe</i>				
<i>Santalum acuminatum</i>				
<i>Exocarpos aphyllus</i>				
<i>Acacia jennerae</i>				
<i>Eucalyptus salmonophloia</i>				
<i>Eucalyptus lesouefii</i>				



<b>Site:</b>	RS048	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	12 November 2016	<b>Position:</b>	-31.215274, 121.591347
<b>Total vegetation cover (%):</b>	0	<b>Topography:</b>	seasonally wet area
<b>Tree/shrub cover &gt;2 m (%):</b>	0	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	0	<b>Soil:</b>	sandy clay
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Excellent, Keighery (1994)		
<b>Vegetation description:</b>	Mid sparse <i>Eremophila alternifolia</i> and <i>E. drummondii</i> sparse shrubland over low open <i>Atriplex vesicaria</i> , <i>Maireana pyramidata</i> , <i>Maireana sedifolia</i> and <i>Lycium australe</i> shrubland over low open mixed grassland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eremophila alternifolia</i>	00.5	02.20		
<i>Lycium australe</i>				
<i>Maireana sedifolia</i>				
<i>Maireana pyramidata</i>				
<i>Atriplex vesicaria</i>				
<i>Eremophila drummondii</i>				

<b>Site:</b>	RS049	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	12 November 2016	<b>Position:</b>	-31.217686, 121.603925
<b>Total vegetation cover (%):</b>	30	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	25	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	5	<b>Soil:</b>	gravel / alluvial, sandy clay, rocks
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	granite rocks
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Low open <i>Eucalyptus websteriana</i> subsp. <i>websteriana</i> , <i>E. celastroides</i> subsp. <i>celastroides</i> and <i>Brachychiton gregorii</i> woodland over tall sparse <i>Acacia burkittii</i> shrubland over low sparse <i>Enchylaena tomentosa</i> and <i>Ptilotus obovatus</i> shrubland over isolated low <i>Podolepis capillaris</i> forbs and mixed grasses.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus websteriana</i> subsp. <i>websteriana</i>	00.3	06.00		
<i>Podolepis capillaris</i>				
<i>Ptilotus obovatus</i>				
<i>Enchylaena tomentosa</i>				
<i>Acacia burkittii</i>				
<i>Brachychiton gregorii</i>				
<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i>				

<b>Site:</b>	RS050	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	13 November 2016	<b>Position:</b>	-31.537466, 121.538297
<b>Total vegetation cover (%):</b>	50	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	25	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	30	<b>Soil:</b>	sandy clay, loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus oleosa</i> subsp. <i>oleosa</i> and <i>E. griffithsii</i> woodland over tall <i>Melaleuca lanceolata</i> , <i>Exocarpos aphyllus</i> and <i>Santalum acuminatum</i> shrubland over mid open <i>Acacia hemiteles</i> , <i>Cratystylis conocephala</i> , <i>Eremophila scoparia</i> and <i>Scaevola bursariifolia</i> shrubland over low sparse <i>Westringia rigida</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Scaevola bursariifolia</i>	15.0	01.50		
<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>	15.0	12.00		
<i>Melaleuca lanceolata</i>	10.0	04.00		
<i>Westringia rigida</i>	05.0	00.40		
<i>Eremophila scoparia</i>				
<i>Cratystylis conocephala</i>				
<i>Acacia hemiteles</i>				
<i>Santalum acuminatum</i>				
<i>Exocarpos aphyllus</i>				
<i>Eucalyptus griffithsii</i>				

<b>Site:</b>	RS051	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	13 November 2016	<b>Position:</b>	-31.540754, 121.532753
<b>Total vegetation cover (%):</b>	65	<b>Topography:</b>	drainage line
<b>Tree/shrub cover &gt;2 m (%):</b>	55	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	15	<b>Soil:</b>	sand
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus transcontinentalis</i> and <i>E. yilgarnensis</i> woodland over tall open <i>Melaleuca lanceolata</i> shrubland over mid sparse <i>Acacia hemiteles</i> and <i>Eremophila ionantha</i> shrubland over low sparse <i>Westringia caphalanth</i> var. <i>cephalanth</i> and <i>Olearia exiguiifolia</i> shrubland over mid sparse <i>Lepidosperma sanguinolentum</i> and <i>Lomandra effusa</i> sedgeland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus transcontinentalis</i>	30.0	10.00		
<i>Westringia caphalanth</i> var. <i>cephalanth</i>	07.0	00.80		
<i>Olearia exiguiifolia</i>	02.0	00.30		
<i>Lepidosperma sanguinolentum</i>	01.0	00.80		
<i>Lomandra effusa</i>				
<i>Eremophila ionantha</i>				
<i>Acacia hemiteles</i>				
<i>Melaleuca lanceolata</i>				
<i>Eucalyptus yilgarnensis</i>				



<b>Site:</b>	RS052	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	13 November 2016	<b>Position:</b>	-31.542966, 121.530427
<b>Total vegetation cover (%):</b>	65	<b>Topography:</b>	hill slope
<b>Tree/shrub cover &gt;2 m (%):</b>	35	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	40	<b>Soil:</b>	sand
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus celastroides</i> subsp. <i>celastroides</i> , <i>E. transcontinentalis</i> and <i>E. yilgarnensis</i> woodland over mid <i>Bertya dimerostigma</i> , <i>Grevillea huegelii</i> and <i>Santalum acuminatum</i> shrubland over low open <i>Cryptandra crispula</i> shrubland over mid open <i>Lepidosperma sanguinolentum</i> , <i>Lomandra effusa</i> and <i>Schoenus subaphyllus</i> sedgeland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Bertya dimerostigma</i>	20.0	01.50		P3 (WC Act)
<i>Cryptandra crispula</i>	07.0	00.40		
<i>Grevillea huegelii</i>	00.5	01.20		
<i>Schoenus subaphyllus</i>	00.1	00.20		
<i>Lomandra effusa</i>				
<i>Lepidosperma sanguinolentum</i>				
<i>Santalum acuminatum</i>				
<i>Eucalyptus yilgarnensis</i>				
<i>Eucalyptus transcontinentalis</i>				
<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i>				

<b>Site:</b>	RS053	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	13 November 2016	<b>Position:</b>	-31.502823, 121.408919
<b>Total vegetation cover (%):</b>	45	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	25	<b>Soil colour:</b>	brown
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	sand
<b>Grass cover (%):</b>	5	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus eremophila</i> subsp. <i>eremophila</i> , <i>E. celastroides</i> subsp. <i>virella</i> and <i>E. urna</i> woodland over tall sparse <i>Acacia nyssophylla</i> , <i>Alyxia buxifolia</i> and <i>Grevillea oncogyne</i> shrubland over mid sparse <i>Acacia hemiteles</i> <i>Bertya dimerostigma</i> and <i>Eremophila caperata</i> shrubland over low sparse <i>Olearia exiguifolia</i> and <i>Phebalium tuberosum</i> shrubland over low sparse <i>Triodia</i> ? <i>scariosa</i> hummock grassland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus eremophila</i> subsp. <i>eremophila</i>	10.0	10.00		
<i>Triodia</i> ? <i>scariosa</i>	05.0	00.30		
<i>Eucalyptus celastroides</i> subsp. <i>virella</i>	05.0	10.00		
<i>Phebalium tuberosum</i>	03.0	01.00		
<i>Grevillea oncogyne</i>	00.5	02.50		
<i>Olearia exiguifolia</i>				
<i>Eremophila caperata</i>				
<i>Bertya dimerostigma</i>				
<i>Acacia hemiteles</i>				
<i>Alyxia buxifolia</i>				
<i>Acacia nyssophylla</i>				
<i>Eucalyptus urna</i>				

<b>Site:</b>	RS054	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	13 November 2016	<b>Position:</b>	-31.50801, 121.412737
<b>Total vegetation cover (%):</b>	70	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	40	<b>Soil colour:</b>	yellow,
<b>Shrub cover &lt;2 m (%):</b>	30	<b>Soil:</b>	sand
<b>Grass cover (%):</b>	2	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	1 – 5 years
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Excellent, Keighery (1994)		
<b>Vegetation description:</b>	Mid isolated <i>Eucalyptus leptopoda</i> subsp. <i>subluta</i> mallee over tall open <i>Leptospermum subtenue</i> , <i>Melaleuca hamata</i> and <i>M. zeteticorum</i> shrubland over low open <i>Cyathostemon</i> SIRS1 and <i>Leucopogon</i> sp. Coolgardie shrubland over mid open <i>Lepidosperma sanguinolentum</i> sedgeland over isolated low <i>Triodia desertorum</i> hummock grasses.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Melaleuca zeteticorum</i>	10.0	02.20		
<i>Leptospermum subtenue</i>	10.0	02.00		
<i>Leucopogon</i> sp. Coolgardie (M. Hislop & F. Hort MH 3197)	05.0	00.40		
<i>Callitris preissii</i>	05.0	04.00		
<i>Melaleuca hamata</i>	05.0	02.80		
<i>Cyathostemon</i> SIRS1	05.0	00.70		
<i>Acacia resinimarginea</i>	03.0	02.50		
<i>Triodia desertorum</i>	02.0	00.30		
<i>Hakea francisiana</i>	02.0	03.00		
<i>Eucalyptus leptopoda</i> subsp. <i>subluta</i>	02.0	05.00		
<i>Lepidosperma sanguinolentum</i>				

<b>Site:</b>	RS055	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	13 November 2016	<b>Position:</b>	-31.528323, 121.427568
<b>Total vegetation cover (%):</b>	55	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	35	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	25	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	3	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus celastroides</i> subsp. <i>celastroides</i> , <i>E. oleosa</i> subsp. <i>oleosa</i> and <i>E. salubris</i> woodland over tall open <i>Acacia nyssophylla</i> , <i>Eremophila caperata</i> and <i>Santalum acuminata</i> shrubland over mid open <i>Acacia resinistipulea</i> , <i>A. hemiteles</i> and <i>Scaevola spinescens</i> shrubland over low sparse <i>Grevillea acuaria</i> , <i>Olearia exiguifolia</i> and <i>Westringia cephalantha</i> shrubland over isolated low <i>Aristida contorta</i> grasses.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eremophila caperata</i>	05.0	01.80		
<i>Grevillea acuaria</i>	02.0	00.30		
<i>Acacia resinistipulea</i>	01.0	01.80		
<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>	01.0	10.00		
<i>Aristida contorta</i>				
<i>Westringia cephalantha</i>				
<i>Olearia exiguifolia</i>				
<i>Scaevola spinescens</i>				
<i>Acacia hemiteles</i>				
<i>Santalum acuminatum</i>				
<i>Acacia nyssophylla</i>				
<i>Eucalyptus salubris</i>				
<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i>				



<b>Site:</b>	RS057	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	13 November 2016	<b>Position:</b>	-31.561593, 121.451788
<b>Total vegetation cover (%):</b>	40	<b>Topography:</b>	hill top
<b>Tree/shrub cover &gt;2 m (%):</b>	25	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Excellent, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus transcontinentalis</i> woodland over tall open <i>Melaleuca pauperiflora</i> subsp. <i>fastigiata</i> shrubland over mid sparse <i>Acacia hemiteles</i> , <i>Exocarpos aphyllus</i> and <i>Scaevola spinescens</i> shrubland over low sparse <i>Eremophila clavata</i> and <i>Olearia muelleri</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eremophila clavata</i>	07.0	00.30		
<i>Melaleuca pauperiflora</i> subsp. <i>fastigiata</i>	07.0	04.00		
<i>Eucalyptus transcontinentalis</i>	02.0	10.00		
<i>Olearia muelleri</i>				
<i>Scaevola spinescens</i>				
<i>Exocarpos aphyllus</i>				
<i>Acacia hemiteles</i>				

<b>Site:</b>	RS058	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	13 November 2016	<b>Position:</b>	-31.571446, 121.459099
<b>Total vegetation cover (%):</b>	65	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	55	<b>Soil colour:</b>	yellow,
<b>Shrub cover &lt;2 m (%):</b>	10	<b>Soil:</b>	sand
<b>Grass cover (%):</b>	5	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Isolated mid <i>Eucalyptus leptopoda</i> subsp. <i>subluta</i> mallee over tall <i>Allocasuarina acutivalvis</i> subsp. <i>acutivalvis</i> and <i>Melaleuca hamata</i> shrubland over mid open <i>Cyathostemon</i> SIRS1, <i>Phebalium</i> ? <i>lepidotum</i> and <i>Leptospermum subtenue</i> shrubland over sparse low <i>Prostanthera incurvata</i> , <i>Homalocalyx thryptomenoides</i> shrubland over isolated low <i>Triodia desertorum</i> hummock grasses and mid isolated <i>Lepidosperma</i> ? <i>viscidum</i> sedges.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Allocasuarina acutivalvis</i> subsp. <i>acutivalvis</i>	25.0	03.00		
<i>Leptospermum subtenue</i>	15.0	01.80		
<i>Homalocalyx thryptomenoides</i>	03.0	00.30		
<i>Triodia desertorum</i>	03.0	00.30		
<i>Prostanthera incurvata</i>	03.0	00.40		
<i>Lepidosperma</i> ? <i>viscidum</i>	02.0	00.60		
<i>Phebalium</i> ? <i>lepidotum</i>	01.0	01.80		
<i>Cyathostemon</i> SIRS1				
<i>Melaleuca hamata</i>				
<i>Eucalyptus leptopoda</i> subsp. <i>subluta</i>				

<b>Site:</b>	RS059	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	13 November 2016	<b>Position:</b>	-31.516518, 121.721199
<b>Total vegetation cover (%):</b>	20	<b>Topography:</b>	breakaway
<b>Tree/shrub cover &gt;2 m (%):</b>	15	<b>Soil colour:</b>	brown
<b>Shrub cover &lt;2 m (%):</b>	10	<b>Soil:</b>	sandy loam, rocks,
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	granite outcropping
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Excellent, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus celastroides</i> subsp. <i>celastroides</i> and <i>E. lesouefii</i> woodland over tall open <i>Eremophila dempsteri</i> and <i>Santalum acuminatum</i> shrubland over mid open <i>Atriplex nummularia</i> , <i>A. bunburyana</i> , <i>Dodonaea lobulata</i> and <i>Eremophila scoparia</i> shrubland over isolated low <i>Olearia muelleri</i> shrubs.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i>				
<i>Olearia muelleri</i>				
<i>Eremophila scoparia</i>				
<i>Dodonaea lobulata</i>				
<i>Atriplex bunburyana</i>				
<i>Atriplex nummularia</i>				
<i>Santalum acuminatum</i>				
<i>Eremophila dempsteri</i>				
<i>Eucalyptus lesouefii</i>				

<b>Site:</b>	RS060	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	13 November 2016	<b>Position:</b>	-31.554288, 121.743015
<b>Total vegetation cover (%):</b>	45	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	30	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	sand
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus oleosa</i> subsp. <i>oleosa</i> and <i>E. lesouefii</i> woodland over tall open <i>Eremophila interstans</i> and <i>Santalum acuminatum</i> shrubland over mid <i>Halgania andromedifolia</i> , <i>Scaevola spinescens</i> and <i>Senna artemisioides</i> subsp. <i>petiolaris</i> shrubland over low sparse <i>Ptilotus obovatus</i> and <i>Senna cardiosperma</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>	10.0	12.00		
<i>Senna cardiosperma</i>	00.5	00.30		
<i>Ptilotus obovatus</i>				
<i>Senna artemisioides</i> subsp. <i>petiolaris</i>				
<i>Scaevola spinescens</i>				
<i>Halgania andromedifolia</i>				
<i>Santalum acuminatum</i>				
<i>Eremophila interstans</i>				
<i>Eucalyptus lesouefii</i>				



<b>Site:</b>	RS061	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	13 November 2016	<b>Position:</b>	-31.672798, 121.765829
<b>Total vegetation cover (%):</b>	45	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	30	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	25	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus lesouefii</i> , <i>E. oleosa</i> subsp. <i>oleosa</i> and <i>E. salubris</i> woodland over tall sparse <i>Melaleuca sheathiana</i> <i>Alyxia buxifolia</i> , <i>Exocarpos aphyllus</i> and <i>Santalum acuminatum</i> shrubland over mid open <i>Eremophila scoparia</i> , <i>Atriplex bunburyana</i> , <i>Maireana sedifolia</i> and <i>Scaevola spinescens</i> shrubland over low sparse <i>Olearia muelleri</i> and <i>Westringia cephalantha</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Melaleuca sheathiana</i>	05.0	04.00		
<i>Westringia cephalantha</i>				
<i>Olearia muelleri</i>				
<i>Scaevola spinescens</i>				
<i>Maireana sedifolia</i>				
<i>Atriplex bunburyana</i>				
<i>Eremophila scoparia</i>				
<i>Santalum acuminatum</i>				
<i>Exocarpos aphyllus</i>				
<i>Alyxia buxifolia</i>				
<i>Eucalyptus salubris</i>				
<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>				
<i>Eucalyptus lesouefii</i>				

<b>Site:</b>	RS062	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	13 November 2016	<b>Position:</b>	-31.612223, 121.750388
<b>Total vegetation cover (%):</b>	60	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	35	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	40	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus celastroides</i> subsp. <i>celastroides</i> , <i>E. lesouefii</i> and <i>E. transcontinentalis</i> woodland over tall open <i>Melaleuca sheathiana</i> , <i>Alyxia buxifolia</i> , <i>Santalum acuminatum</i> and <i>Eremophila scoparia</i> shrubland over mid <i>Eremophila caperata</i> , <i>Halgania andromedifolia</i> and <i>Scaevola spinescens</i> shrubland over low sparse <i>Olearia muelleri</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus transcontinentalis</i>	05.0	12.00		
<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i>	05.0	10.00		
<i>Olearia muelleri</i>				
<i>Scaevola spinescens</i>				
<i>Halgania andromedifolia</i>				
<i>Eremophila caperata</i>				
<i>Eremophila scoparia</i>				
<i>Santalum acuminatum</i>				
<i>Alyxia buxifolia</i>				
<i>Melaleuca sheathiana</i>				
<i>Eucalyptus lesouefii</i>				

<b>Site:</b>	RS063	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	13 November 2016	<b>Position:</b>	-31.626711, 121.746823
<b>Total vegetation cover (%):</b>	45	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	25	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	25	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus lesouefii</i> , <i>E. salubris</i> , <i>E. salmonophloia</i> and <i>E. transcontinentalis</i> woodland over isolated tall <i>Melaleuca sheathiana</i> shrubs over mid open <i>Acacia jennerae</i> , <i>Santalum acuminatum</i> and <i>Senna artemisioides</i> subsp. <i>petiolaris</i> shrubland over low sparse <i>Eremophila ionantha</i> , <i>Scaevola spinescens</i> and <i>Westringia cephalantha</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus lesouefii</i>				
<i>Westringia cephalantha</i>				
<i>Scaevola spinescens</i>				
<i>Eremophila ionantha</i>				
<i>Senna artemisioides</i> subsp. <i>petiolaris</i>				
<i>Santalum acuminatum</i>				
<i>Acacia jennerae</i>				
<i>Melaleuca sheathiana</i>				
<i>Eucalyptus transcontinentalis</i>				
<i>Eucalyptus salmonophloia</i>				
<i>Eucalyptus salubris</i>				

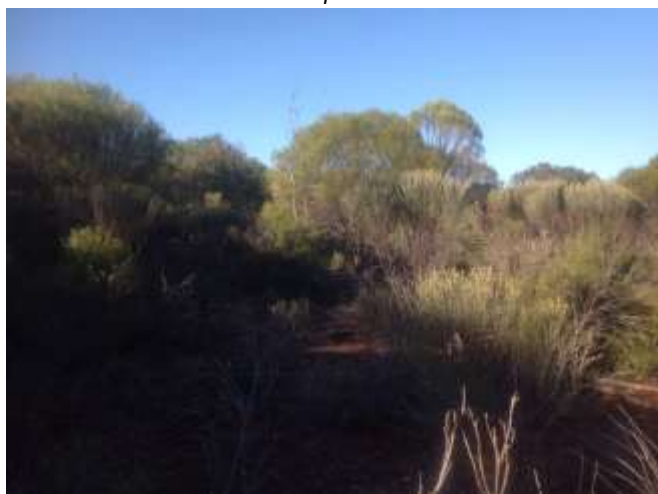
<b>Site:</b>	RS064	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	13 November 2016	<b>Position:</b>	-31.597347, 121.71738
<b>Total vegetation cover (%):</b>	45	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	25	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	25	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus lesouefii</i> , <i>E. oleosa</i> subsp. <i>oleosa</i> and <i>E. transcontinentalis</i> woodland over tall open <i>Melaleuca sheathiana</i> shrubland over mid open <i>Alyxia buxifolia</i> , <i>Eremophila caperata</i> and <i>Santalum acuminata</i> shrubland over low sparse <i>Scaevola spinescens</i> and <i>Westringia cephalantha</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>	05.0	10.00		
<i>Westringia cephalantha</i>				
<i>Scaevola spinescens</i>				
<i>Santalum acuminatum</i>				
<i>Eremophila caperata</i>				
<i>Alyxia buxifolia</i>				
<i>Melaleuca sheathiana</i>				
<i>Eucalyptus transcontinentalis</i>				
<i>Eucalyptus lesouefii</i>				



<b>Site:</b>	RS065	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	13 November 2016	<b>Position:</b>	-31.592283, 121.717207
<b>Total vegetation cover (%):</b>	65	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	50	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	sandy clay
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Excellent, Keighery (1994)		
<b>Vegetation description:</b>	Low isolated <i>Eucalyptus oleosa</i> subsp. <i>oleosa</i> trees over tall open <i>Acacia burkittii</i> , <i>Alyxia buxifolia</i> shrubland over mid open <i>Eremophila scoparia</i> , <i>Exocarpos aphyllus</i> and <i>Eremophila decipiens</i> shrubland over low sparse <i>Olearia muelleri</i> and <i>O. pimeleoides</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Olearia pimeleoides</i>	07.0	00.30		
<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>	02.0	06.00		
<i>Olearia muelleri</i>				
<i>Eremophila decipiens</i>				
<i>Exocarpos aphyllus</i>				
<i>Eremophila scoparia</i>				
<i>Alyxia buxifolia</i>				
<i>Acacia burkittii</i>				

<b>Site:</b>	RS066	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	14 November 2016	<b>Position:</b>	-31.413194, 121.840228
<b>Total vegetation cover (%):</b>	35	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	10	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	30	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid open <i>Eucalyptus transcontinentalis</i> , <i>E. salubris</i> and <i>E. salmonophloia</i> woodland over tall open <i>Eremophila scoparia</i> and <i>Santalum acuminatum</i> shrubland over mid <i>Acacia hemiteles</i> , <i>Cratystylis conocephala</i> and <i>Eremophila decipiens</i> shrubland over low open <i>Olearia muelleri</i> and <i>Scaevola spinescens</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus transcontinentalis</i>	04.0	10.00		
<i>Scaevola spinescens</i>				
<i>Olearia muelleri</i>				
<i>Eremophila decipiens</i>				
<i>Cratystylis conocephala</i>				
<i>Acacia hemiteles</i>				
<i>Santalum acuminatum</i>				
<i>Eremophila scoparia</i>				
<i>Eucalyptus salmonophloia</i>				
<i>Eucalyptus salubris</i>				

<b>Site:</b>	RS067	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	14 November 2016	<b>Position:</b>	-31.413498, 121.848736
<b>Total vegetation cover (%):</b>	35	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	20	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus lesouefii</i> , <i>E. oleosa</i> subsp. <i>oleosa</i> woodland over tall sparse <i>Melaleuca sheathiana</i> shrubland over mid <i>Acacia hemiteles</i> , <i>Eremophila scoparia</i> , <i>Santalum acuminatum</i> shrubland over low sparse <i>Senna artemisioides</i> subsp. <i>petiolaris</i> , <i>Scaevola spinescens</i> and <i>Westringia cephalantha</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Austrostipa platychaeta</i>	00.1			
<i>Westringia cephalantha</i>				
<i>Scaevola spinescens</i>				
<i>Senna artemisioides</i> subsp. <i>petiolaris</i>				
<i>Santalum acuminatum</i>				
<i>Eremophila scoparia</i>				
<i>Acacia hemiteles</i>				
<i>Melaleuca sheathiana</i>				
<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>				
<i>Eucalyptus lesouefii</i>				

<b>Site:</b>	RS068	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	14 November 2016	<b>Position:</b>	-31.40335, 121.854563
<b>Total vegetation cover (%):</b>	35	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	20	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid open <i>Eucalyptus lesouefii</i> , <i>E. oleosa</i> subsp. <i>oleosa</i> and <i>E. transcontinentalis</i> woodland over tall open <i>Dodonaea viscosa</i> and <i>Eremophila interstans</i> shrubland over mid open <i>Cratystylis conocephala</i> , <i>Eremophila scoparia</i> , <i>Maireana sedifolia</i> and <i>Senna artemisioides</i> subsp. <i>petiolaris</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus lesouefii</i>				
<i>Senna artemisioides</i> subsp. <i>petiolaris</i>				
<i>Maireana sedifolia</i>				
<i>Eremophila scoparia</i>				
<i>Cratystylis conocephala</i>				
<i>Eremophila interstans</i>				
<i>Dodonaea viscosa</i>				
<i>Eucalyptus transcontinentalis</i>				
<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>				



<b>Site:</b>	RS069	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	14 November 2016	<b>Position:</b>	-31.400867, 121.854092
<b>Total vegetation cover (%):</b>	40	<b>Topography:</b>	drainage line
<b>Tree/shrub cover &gt;2 m (%):</b>	20	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	25	<b>Soil:</b>	sandy clay, loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus celastroides</i> subsp. <i>celastroides</i> and <i>E. salmonophloia</i> woodland over tall sparse <i>Acacia quadrimarginea</i> , <i>Eremophila interstans</i> and <i>E. drummondii</i> shrubland over mid <i>Eremophila decipiens</i> , <i>E. scoparia</i> , <i>Maireana sedifolia</i> and <i>Senna artemisioides</i> subsp. <i>petiolaris</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eremophila drummondii</i>	15.0	02.20		
<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i>	10.0	10.00		
<i>Ptilotus</i> sp. Goldfields (R. Davis 10796)	00.1	00.10		
<i>Senna artemisioides</i> subsp. <i>petiolaris</i>				
<i>Maireana sedifolia</i>				
<i>Eremophila scoparia</i>				
<i>Eremophila decipiens</i>				
<i>Eremophila interstans</i>				
<i>Acacia quadrimarginea</i>				
<i>Eucalyptus salmonophloia</i>				

<b>Site:</b>	RS070	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	14 November 2016	<b>Position:</b>	-31.392665, 121.854378
<b>Total vegetation cover (%):</b>	55	<b>Topography:</b>	drainage line
<b>Tree/shrub cover &gt;2 m (%):</b>	0	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	25	<b>Soil:</b>	sandy clay
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	20	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	weed infestation, vehicle tracks, grazing		
<b>Vegetation condition:</b>	Excellent, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Acacia hemiteles</i> , <i>Eremophila alternifolia</i> , <i>Maireana sedifolia</i> and <i>Senna artemisioides</i> subsp. <i>petiolaris</i> shrubland over low open <i>Ptilotus obovatus</i> and <i>Senna cardiosperma</i> shrubland over low open <i>Oncosiphon suffruticosum</i> and <i>Salvia verbenaca</i> forbland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Senna cardiosperma</i>	10.0	01.00		
<i>Senna artemisioides</i> subsp. <i>petiolaris</i>	02.0	01.20		
<i>Eremophila maculata</i> subsp. <i>brevifolia</i>	00.1	00.80		
<i>Salvia verbenaca</i>			*	
<i>Oncosiphon suffruticosum</i>			*	
<i>Ptilotus obovatus</i>				
<i>Maireana sedifolia</i>				
<i>Eremophila alternifolia</i>				
<i>Acacia hemiteles</i>				

<b>Site:</b>	RS071	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	14 November 2016	<b>Position:</b>	-31.367756, 121.817194
<b>Total vegetation cover (%):</b>	45	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	20	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	30	<b>Soil:</b>	sandy clay
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Excellent, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus lesouefii</i> , <i>E. oleosa</i> subsp. <i>oleosa</i> and <i>E. salubris</i> woodland over tall sparse <i>Eremophila interstans</i> and <i>Santalum acuminatum</i> shrubland over mid <i>Atriplex bunburyana</i> , <i>A. nummularia</i> , <i>Eremophila alternifolia</i> and <i>E. scoparia</i> shrubland over low sparse <i>Olearia muelleri</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus lesouefii</i>				
<i>Olearia muelleri</i>				
<i>Eremophila scoparia</i>				
<i>Eremophila alternifolia</i>				
<i>Atriplex nummularia</i>				
<i>Atriplex bunburyana</i>				
<i>Santalum acuminatum</i>				
<i>Eremophila interstans</i>				
<i>Eucalyptus salubris</i>				
<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>				

<b>Site:</b>	RS072	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	14 November 2016	<b>Position:</b>	-31.367765, 121.820352
<b>Total vegetation cover (%):</b>	35	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	20	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	gravel / alluvial, sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	vehicle tracks		
<b>Vegetation condition:</b>	Excellent, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus ravida</i> and <i>E. oleosa</i> subsp. <i>oleosa</i> woodland over isolated tall <i>Eremophila interstans</i> shrubs over low <i>Eremophila drummondii</i> , <i>Atriplex nummularia</i> , <i>A. bunburyana</i> and <i>Maireana sedifolia</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus ravida</i>				
<i>Maireana sedifolia</i>				
<i>Atriplex bunburyana</i>				
<i>Atriplex nummularia</i>				
<i>Eremophila drummondii</i>				
<i>Eremophila interstans</i>				
<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>				



<b>Site:</b>	RS073	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	14 November 2016	<b>Position:</b>	-31.34929, 121.834563
<b>Total vegetation cover (%):</b>	80	<b>Topography:</b>	plain
<b>Tree/shrub cover &gt;2 m (%):</b>	75	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	10	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid open <i>Eucalyptus salmonophloia</i> woodland over tall closed <i>Acacia burkittii</i> shrubland over isolated mid <i>Eremophila decipiens</i> and <i>Senna artemisioides</i> subsp. <i>petiolaris</i> shrubs.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus salmonophloia</i>				
<i>Senna artemisioides</i> subsp. <i>petiolaris</i>				
<i>Eremophila decipiens</i>				
<i>Acacia burkittii</i>				

<b>Site:</b>	RS075	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	14 November 2016	<b>Position:</b>	-31.353617, 121.821499
<b>Total vegetation cover (%):</b>	0	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	0	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	0	<b>Soil:</b>	sandy clay
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Excellent, Keighery (1994)		
<b>Vegetation description:</b>	Mid isolated <i>Eucalyptus salmonophloia</i> and <i>E. salubris</i> trees over tall open <i>Eremophila alternifolia</i> shrubland over mid open <i>Maireana sedifolia</i> and <i>Atriplex nummularia</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus salmonophloia</i>				
<i>Atriplex nummularia</i>				
<i>Maireana sedifolia</i>				
<i>Eremophila alternifolia</i>				
<i>Eucalyptus salubris</i>				

<b>Site:</b>	RS076	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	14 November 2016	<b>Position:</b>	-31.353426, 121.810657
<b>Total vegetation cover (%):</b>	60	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	40	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	30	<b>Soil:</b>	sandy clay
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus salmonophloia</i> woodland over tall open <i>Eremophila scoparia</i> and <i>E. interstans</i> shrubland over mid <i>Maireana sedifolia</i> , <i>Senna artemisioides</i> subsp. <i>petiolaris</i> and <i>Exocarpos aphyllus</i> shrubland over isolated low <i>Olearia muelleri</i> shrubs and isolated low <i>Sclerolaena diacantha</i> forbs.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus salmonophloia</i>				
<i>Sclerolaena diacantha</i>				
<i>Olearia muelleri</i>				
<i>Exocarpos aphyllus</i>				
<i>Senna artemisioides</i> subsp. <i>petiolaris</i>				
<i>Maireana sedifolia</i>				
<i>Eremophila interstans</i>				
<i>Eremophila scoparia</i>				

<b>Site:</b>	RS077	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	14 November 2016	<b>Position:</b>	-31.33117, 121.816048
<b>Total vegetation cover (%):</b>	45	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	25	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	25	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid open <i>Eucalyptus oleosa</i> subsp. <i>oleosa</i> , <i>E. salmonophloia</i> and <i>E. salubris</i> woodland over tall open <i>Acacia hemiteles</i> , <i>Dodonaea viscosa</i> and <i>Exocarpos aphyllus</i> shrubland over mid open <i>Senna artemisioides</i> subsp. <i>petiolaris</i> , <i>Cratystylis conocephala</i> and <i>Scaevola spinescens</i> shrubland over isolated low <i>Olearia muelleri</i> shrubs.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>				
<i>Olearia muelleri</i>				
<i>Scaevola spinescens</i>				
<i>Cratystylis conocephala</i>				
<i>Senna artemisioides</i> subsp. <i>petiolaris</i>				
<i>Exocarpos aphyllus</i>				
<i>Dodonaea viscosa</i>				
<i>Acacia hemiteles</i>				
<i>Eucalyptus salubris</i>				
<i>Eucalyptus salmonophloia</i>				



<b>Site:</b>	RS078	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	14 November 2016	<b>Position:</b>	-31.319327, 121.79044
<b>Total vegetation cover (%):</b>	50	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	30	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	10	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	25	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus cylindrocarpa</i> woodland over tall sparse <i>Eremophila caperata</i> and <i>Exocarpos aphyllus</i> shrubland over mid sparse <i>Cratystylis conocephala</i> shrubland over low open <i>Triodia ? irritans</i> hummock grassland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Triodia ? irritans</i>	25.0	00.30		
<i>Cratystylis conocephala</i>				
<i>Exocarpos aphyllus</i>				
<i>Eremophila caperata</i>				
<i>Eucalyptus cylindrocarpa</i>				

<b>Site:</b>	RS079	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	14 November 2016	<b>Position:</b>	-31.304353, 121.79972
<b>Total vegetation cover (%):</b>	45	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	30	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	1	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	25	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	<i>Eucalyptus striatocalyx</i> woodland over tall <i>Acacia burkittii</i> shrubland over low sparse <i>Cooperhooia strophilata</i> and <i>Grevillea acuarina</i> shrubland over <i>Triodia irritans</i> hummock grassland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus striatocalyx</i>	20.0	08.00		
<i>Cooperhooia strophilata</i>	02.0	00.30		
<i>Triodia irritans</i>				
<i>Grevillea acuarina</i>				
<i>Acacia burkittii</i>				

<b>Site:</b>	RS080	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	14 November 2016	<b>Position:</b>	-31.51374, 121.760218
<b>Total vegetation cover (%):</b>	60	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	45	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	sandy clay
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Low isolated <i>Eucalyptus oleosa</i> subsp. <i>oleosa</i> trees over tall <i>Acacia burkittii</i> shrubland over mid open <i>Dodonaea adenophora</i> , <i>Eremophila serrulata</i> and <i>E. alternifolia</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>				
<i>Eremophila alternifolia</i>				
<i>Eremophila serrulata</i>				
<i>Dodonaea adenophora</i>				
<i>Acacia burkittii</i>				

<b>Site:</b>	RS081	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	14 November 2016	<b>Position:</b>	-31.501764, 121.739149
<b>Total vegetation cover (%):</b>	45	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	25	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	15	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus urna</i> , <i>E. striatocalyx</i> and <i>E. salmonophloia</i> woodland over isolated mid <i>Eremophila caperata</i> , <i>E. scoparia</i> and <i>Exocarpos aphyllus</i> shrubs over <i>Triodia irritans</i> grassland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus urna</i>				
<i>Triodia irritans</i>				
<i>Exocarpos aphyllus</i>				
<i>Eremophila scoparia</i>				
<i>Eremophila caperata</i>				
<i>Eucalyptus salmonophloia</i>				
<i>Eucalyptus striatocalyx</i>				



<b>Site:</b>	RS082	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	14 November 2016	<b>Position:</b>	-31.492413, 121.749857
<b>Total vegetation cover (%):</b>	60	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	30	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	35	<b>Soil:</b>	sand
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus striatocalyx</i> and <i>E. salmonophloia</i> woodland overtall open <i>Callitris columellaris</i> shrubland over isolated low <i>Westringia cephalantha</i> shrubs over low <i>Triodia ? irritans</i> hummock grassland and mid open <i>Lepidosperma sanguinolentum</i> sedgeland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus striatocalyx</i>				
<i>Lepidosperma sanguinolentum</i>				
<i>Triodia ? irritans</i>				
<i>Westringia cephalantha</i>				
<i>Callitris columellaris</i>				
<i>Eucalyptus salmonophloia</i>				

<b>Site:</b>	RS086	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	15 November 2016	<b>Position:</b>	-30.900382, 121.666376
<b>Total vegetation cover (%):</b>	20	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	3	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	gravel / alluvial, sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Excellent, Keighery (1994)		
<b>Vegetation description:</b>	Isolated low <i>Eucalyptus celastroides</i> subsp. <i>celastroides</i> trees over mid open <i>Maireana sedifolia</i> , <i>Cratystylis microcephalla</i> and <i>Lycium australe</i> shrubland over isolated low <i>Maireana glomerifolia</i> shrubs.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Maireana glomerifolia</i>	02.0	00.20		
<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i>	02.0	06.00		
<i>Frankenia interioris</i>	00.1	00.20		
<i>Lycium australe</i>				
<i>Cratystylis microphylla</i>				
<i>Maireana sedifolia</i>				

<b>Site:</b>	RS088	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	15 November 2016	<b>Position:</b>	-31.009778, 121.664896
<b>Total vegetation cover (%):</b>	35	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	0	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	35	<b>Soil:</b>	sandy clay, loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Excellent, Keighery (1994)		
<b>Vegetation description:</b>	Mid open <i>Eucalyptus salmonophloia</i> woodland over mid <i>Atriplex nummularia</i> , <i>Maireana pyramidata</i> and <i>M. sedifolia</i> shrubland over isolated low <i>Sclerolaena diacantha</i> forbs.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus salmonophloia</i>				
<i>Sclerolaena diacantha</i>				
<i>Maireana sedifolia</i>				
<i>Maireana pyramidata</i>				
<i>Atriplex nummularia</i>				

<b>Site:</b>	RS089	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	15 November 2016	<b>Position:</b>	-31.155642, 121.680337
<b>Total vegetation cover (%):</b>	20	<b>Topography:</b>	seasonally wet area
<b>Tree/shrub cover &gt;2 m (%):</b>	0	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	sandy clay, loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Excellent, Keighery (1994)		
<b>Vegetation description:</b>	Mid sparse <i>Dodonaea viscosa</i> and <i>Acacia kalgoorliensis</i> shrubland over low <i>Tecticornia leptoclada</i> subsp. <i>inclusa</i> , <i>T. triandra</i> and <i>Disphyma crassifolium</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Tecticornia leptoclada</i> subsp. <i>inclusa</i>	05.0	00.20		
<i>Tecticornia triandra</i>	05.0	00.20		
<i>Acacia kalgoorliensis</i>	02.0	01.50		
<i>Frankenia setosa</i>	02.0	00.20		
<i>Calandrinia</i> sp. Widgiemooltha (F. Obbens & E. Reid FO 9/05)	00.1	00.10		P1 (WC Act)
<i>Disphyma crassifolium</i>				
<i>Surreya diandra</i>				
<i>Dodonaea viscosa</i>				



<b>Site:</b>	RS090	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	15 November 2016	<b>Position:</b>	-31.149995, 121.680263
<b>Total vegetation cover (%):</b>	15	<b>Topography:</b>	hill slope
<b>Tree/shrub cover &gt;2 m (%):</b>	7	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	10	<b>Soil:</b>	gravel / alluvial, sandy loam, rocks
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	quartz
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	vehicle tracks		
<b>Vegetation condition:</b>	Excellent, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus ravidia</i> , <i>E. celastroides</i> subsp. <i>celastroides</i> and <i>E. stricklandii</i> woodland over tall open <i>Melaleuca lateriflora</i> shrubland over low sparse <i>Grevillea acuaria</i> and <i>Westringia cephalantha</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i>	06.0	10.00		
<i>Eucalyptus stricklandii</i>	03.0	12.00		
<i>Westringia cephalantha</i>				
<i>Grevillea acuaria</i>				
<i>Melaleuca lateriflora</i>				
<i>Eucalyptus diptera</i>				

<b>Site:</b>	RS091	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	15 November 2016	<b>Position:</b>	-31.123846, 121.683267
<b>Total vegetation cover (%):</b>	25	<b>Topography:</b>	seasonally wet area
<b>Tree/shrub cover &gt;2 m (%):</b>	1	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	25	<b>Soil:</b>	sandy clay, loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Isolated low <i>Eucalyptus griffithsii</i> trees over low <i>Cratystylis subspinescens</i> , <i>Tecticornia</i> SIRS20 and <i>Atriplex vesicaria</i> shrubland and low sparse <i>Disphyma crassifolium</i> forbland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Tecticornia</i> SIRS20	07.0	00.40		
<i>Eucalyptus griffithsii</i>	01.0	10.00		
<i>Calandrinia</i> sp. Widgiemooltha (F. Obbens & E. Reid FO 9/05)	00.1	00.15		P1 (WC Act)
<i>Disphyma crassifolium</i>				
<i>Atriplex vesicaria</i>				
<i>Cratystylis subspinescens</i>				

<b>Site:</b>	RS092	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	15 November 2016	<b>Position:</b>	-31.122142, 121.68617
<b>Total vegetation cover (%):</b>	35	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	10	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	30	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	animal tracks, low grazing		
<b>Vegetation condition:</b>	Excellent, Keighery (1994)		
<b>Vegetation description:</b>	Tall open <i>Acacia kalgoorliensis</i> and <i>Eremophila alternifolia</i> shrubland over mid open <i>Maireana sedifolia</i> and <i>Cratystylis subspinescens</i> shrubland over low open <i>Atriplex vesicaria</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Acacia kalgoorliensis</i>				
<i>Atriplex vesicaria</i>				
<i>Cratystylis subspinescens</i>				
<i>Maireana sedifolia</i>				
<i>Eremophila alternifolia</i>				

<b>Site:</b>	RS093	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	15 November 2016	<b>Position:</b>	-31.153405, 121.700627
<b>Total vegetation cover (%):</b>	40	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	7	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	35	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid open <i>Eucalyptus lesouefii</i> and <i>E. ravida</i> woodland over tall <i>Eremophila oldfieldii</i> , <i>Dodonaea lobulata</i> and <i>Casuarina pauper</i> shrubland over mid <i>Cratystylis subspinescens</i> , <i>Eremophila scoparia</i> and <i>Maireana sedifolia</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Casuarina pauper</i>	00.5	04.00		
<i>Maireana sedifolia</i>				
<i>Eremophila scoparia</i>				
<i>Cratystylis subspinescens</i>				
<i>Dodonaea lobulata</i>				
<i>Eremophila oldfieldii</i>				
<i>Eucalyptus ravida</i>				
<i>Eucalyptus lesouefii</i>				



<b>Site:</b>	RS094	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	15 November 2016	<b>Position:</b>	-31.147718, 121.70363
<b>Total vegetation cover (%):</b>	45	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	15	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	35	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus griffithsii</i> woodland over tall open <i>Senna artemisioides</i> subsp. <i>petiolaris</i> shrubland over mid <i>Maireana sedifolia</i> and <i>Cratystylis conocephala</i> shrubland over low sparse <i>Olearia muelleri</i> and <i>Scaevola spinescens</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus griffithsii</i>				
<i>Scaevola spinescens</i>				
<i>Olearia muelleri</i>				
<i>Cratystylis conocephala</i>				
<i>Maireana sedifolia</i>				
<i>Senna artemisioides</i> subsp. <i>petiolaris</i>				

<b>Site:</b>	RS095	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	15 November 2016	<b>Position:</b>	-31.134266, 121.700258
<b>Total vegetation cover (%):</b>	30	<b>Topography:</b>	hill slope
<b>Tree/shrub cover &gt;2 m (%):</b>	10	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	25	<b>Soil:</b>	gravel / alluvial, sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	animal tracks, low grazing		
<b>Vegetation condition:</b>	Excellent, Keighery (1994)		
<b>Vegetation description:</b>	Mid <i>Eucalyptus lesouefii</i> , <i>E. celastroides</i> subsp. <i>celastroides</i> and <i>E. salmonophloia</i> woodland over mid <i>Exocarpos aphyllus</i> , <i>Acacia erinacea</i> , <i>Cratystylis microphylla</i> and <i>Scaevola spinescens</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus celastroides</i> subsp. <i>celastroides</i>	05.0	10.00		
<i>Senna glutinosa</i> subsp. <i>chatelainiana</i>	00.3	00.20		
<i>Scaevola spinescens</i>				
<i>Cratystylis microphylla</i>				
<i>Acacia erinacea</i>				
<i>Exocarpos aphyllus</i>				
<i>Eucalyptus salmonophloia</i>				
<i>Eucalyptus lesouefii</i>				

<b>Site:</b>	RS096	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	15 November 2016	<b>Position:</b>	-31.124623, 121.693684
<b>Total vegetation cover (%):</b>	35	<b>Topography:</b>	undulating plain
<b>Tree/shrub cover &gt;2 m (%):</b>	20	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	20	<b>Soil:</b>	sandy loam
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Low <i>Pittosporum angustifolium</i> woodland over mid <i>Senna artemisioides</i> subsp. <i>petiolaris</i> , <i>Dodonaea viscosa</i> and <i>Maireana sedifolia</i> shrubland over low sparse <i>Scaevola spinescens</i> and <i>Atriplex vesicaria</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eremophila saligna</i>	18.0	04.00		
<i>Atriplex vesicaria</i>				
<i>Scaevola spinescens</i>				
<i>Maireana sedifolia</i>				
<i>Dodonaea viscosa</i>				
<i>Senna artemisioides</i> subsp. <i>petiolaris</i>				
<i>Pittosporum angustifolium</i>				

<b>Site:</b>	RS097	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	15 November 2016	<b>Position:</b>	-31.189401, 121.655848
<b>Total vegetation cover (%):</b>	70	<b>Topography:</b>	hill slope
<b>Tree/shrub cover &gt;2 m (%):</b>	65	<b>Soil colour:</b>	red-orange
<b>Shrub cover &lt;2 m (%):</b>	15	<b>Soil:</b>	sandy loam, rocks, laterite
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Tall <i>Acacia burkittii</i> and <i>A. quadrimarginea</i> and <i>Allocasuarina eriochlamys</i> subsp. <i>grossa</i> shrubland over mid open <i>Eremophila georgei</i> , <i>Prostanthera incurvata</i> and <i>Dodonaea adenophora</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eremophila georgei</i>	05.0	01.70		
<i>Allocasuarina eriochlamys</i> subsp. <i>grossa</i>	02.0	05.00		P3 (WC Act)
<i>Cyathostemon divaricatus</i>				P1 (WC Act)
<i>Dodonaea adenophora</i>				
<i>Prostanthera incurva</i>				
<i>Acacia quadrimarginea</i>				
<i>Acacia burkittii</i>				



<b>Site:</b>	RS098	<b>Type:</b>	Relevé (unbounded)
<b>Date(s):</b>	15 November 2016	<b>Position:</b>	-31.189471, 121.659636
<b>Total vegetation cover (%):</b>	45	<b>Topography:</b>	hill top
<b>Tree/shrub cover &gt;2 m (%):</b>	25	<b>Soil colour:</b>	red-brown
<b>Shrub cover &lt;2 m (%):</b>	25	<b>Soil:</b>	sandy loam, rocks, laterite
<b>Grass cover (%):</b>	0	<b>Rock type:</b>	none
<b>Herb cover (%):</b>	0	<b>Fire age:</b>	not evident
<b>Disturbance details:</b>	none		
<b>Vegetation condition:</b>	Pristine, Keighery (1994)		
<b>Vegetation description:</b>	Low <i>Eucalyptus oleosa</i> subsp. <i>oleosa</i> woodland over tall <i>Acacia burkittii</i> and <i>Eremophila oldfieldii</i> shrubland over mid open <i>Senna artemisioides</i> subsp. <i>petiolaris</i> , <i>Dodonaea lobulata</i> and <i>Scaevola spinescens</i> over low sparse <i>Westringia cephalantha</i> shrubland.		



Species	Cover (%)	Height (m)	Weeds	Conservation status
<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>				
<i>Westringia cephalantha</i>				
<i>Scaevola spinescens</i>				
<i>Dodonaea lobulata</i>				
<i>Senna artemisioides</i> subsp. <i>petiolaris</i>				
<i>Eremophila oldfieldii</i>				
<i>Acacia burkittii</i>				

