



Taroborah Coal Project

Appendix 18 – Terrestrial Flora and Fauna Assessment





Taroborah Coal Project

Terrestrial Flora and Fauna Assessment

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LIST OF ABBREVIATIONS

°C	degrees Celsius
AARC	AustralAsian Resource Consultants Pty Ltd
cm	centimetre
CHPP	Coal Handling and Preparation Plant
DAFF	Department of Agriculture, Fisheries and Forestry
DEHP	Department of Environment and Heritage Protection
EIS	Environmental Impact Statement
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPC	Exploration Permit for Coal
GPS	Global Positioning System
ha	hectare(s)
km	kilometres
km ²	square kilometres
LP Act	<i>Land Protection (Pest and Stock Route Management) Act 2002</i>
m	metre(s)
mm	millimetre(s)
MDL	Mineral Development License
Mtpa	Million tonnes per annum
NC Act	<i>Nature Conservation Act 1992</i>
NCWR	<i>Nature Conservation (Wildlife) Regulation 2006</i>
QEOP	<i>Queensland Environmental Offsets Policy 2014</i>
RE	Regional Ecosystem
REDD	Regional Ecosystem Description Database
Shenhua	Shenhua International Group Pty Ltd

SSBV	State Significant Biodiversity Value
TOR	Terms of Reference
VM Act	<i>Vegetation Management Act 1999</i>
WONS	Weeds of National Significance

EXECUTIVE SUMMARY

AustralAsian Resource Consultants Pty Ltd was commissioned by Shenhua International Group Pty Ltd to conduct a Terrestrial Flora and Fauna Assessment of the proposed Taraborah Coal Project site.

A total of three site visits to conduct terrestrial flora and fauna surveys were undertaken as part of this study between September 2011 and August 2012. The surveys cover both wet and dry seasons to capture seasonal variation in flora and fauna assemblages.

To assess the environmental values of flora and fauna communities on the Project site, the following scope of works was undertaken:

- A literature and database review to identify species of conservation significance known from the region. This review enabled such species to be targeted during the field survey components of the study;
- Standard field survey methodologies to determine the composition of species inhabiting the Project site and corridors, particularly species of conservation significance; and
- Preparation of a report describing significant ecological factors and outlining possible management strategies to reduce any foreseeable impacts associated with the proposed activities.

SITE DESCRIPTION

The Project site is located in the Central Highlands District of Central Queensland approximately 258 kilometres east of Rockhampton and 286 kilometres south-west of Mackay. The closest residential area to the Project is the township of Emerald, located approximately 22 km east of the Project site.

FIELD SURVEY METHODS

Site scoping of the Project site was conducted using aerial photography and broad ground-truthing using four-wheel drive vehicles and on-foot, where terrain proved impassable.

A number of transects were surveyed to obtain a detailed floristic inventory of the dominant and associated woody plants within each vegetation community. In order to map and confirm the extent of the vegetation communities, plots were used within and along the boundaries of the communities. The quality of communities was assessed with regard to their likely value and viability as a representative vegetation type.

Fauna study sites were located in areas representative of the Project's vegetation and habitat types. In addition, habitats potentially inhabited by species of conservation significance were targeted and thoroughly assessed for species occurrence. A range of trapping and survey techniques were employed at each study site including but not limited to pitfall trapping, Elliott trapping, funnel trapping, habitat searching, avian observation, AnaBat recording and spotlighting. Incidental / opportunistic records were included in the species list to establish a comprehensive fauna species list for the Project site.



SURVEY RESULTS

Flora

Thirteen vegetation communities and 205 flora species were identified within the Project site. No plants species of conservation significance listed under either the *Nature Conservation Act 1992* or *Environment Protection and Biodiversity Conservation Act 1999* were identified during the course of the survey. In addition, two areas of Regional Ecosystem 11.8.11 (mapped by the Department of Environment and Heritage Protection) have been included in this Flora and Fauna Assessment as 'Potential Natural Grassland' in order to capture potential impacts to these areas. Further field surveys are proposed to clarify these areas.

A total of thirty-three weed species, including three Class 2 State declared species, Parthenium, Parkinsonia and Fireweed were identified on the Project site. Furthermore, one Class 3 weed species, lantana and several weed species not declared under the LP Act were identified within the Project site. All four declared species are also listed as Weeds of National Significance.

Six of the thirteen vegetation communities were classed as 'Remnant Vegetation' as defined in the Queensland *Vegetation Management Act 1999*. A summary of the conservation significance of all vegetation communities occurring on the Project site and their equivalent Regional Ecosystems is provided in Table A.

Table A Vegetation Communities and Corresponding Conservation Status

Vegetation Community		Regional Ecosystem Equivalents	VM Act (1999) Status	DEHP Biodiversity Status	EPBC Act Status
1	River Red Gum Riparian Woodland	RE 11.3.25	Least Concern	Of Concern	Not Listed
2	River Teatree Riparian Woodland	RE 11.3.3a	Of Concern	Of Concern	Not Listed
3	Lancewood Woodland	RE 11.10.3	Least Concern	No Concern	Not Listed
4	Brigalow Woodland	RE 11.9.1	Endangered	Endangered	Endangered
5	Dawson Gum Open Woodland	RE 11.4.8	Endangered	Endangered	Endangered
6	Silver-leaved Ironbark Open Woodland	Not Classed	Not Listed	Not Listed	Not Listed
7	Silver-leaved Ironbark Open Woodland	RE 11.3.6	Least Concern	Of Concern	Not Listed
8	Poplar Box Open Woodland	Not Classed	Not Listed	Not Listed	Not Listed
9	Belah Low Open Woodland	RE 11.4.9*	-	-	-



Vegetation Community		Regional Ecosystem Equivalents	VM Act (1999) Status	DEHP Biodiversity Status	EPBC Act Status
10	Brigalow / Belah Low Open Woodland	RE 11.4.9	Endangered	Endangered	Endangered
11	Non-remnant Grassland	Not Classed	Not Listed	Not Listed	Not Listed
12	Palustrine Wetland	Not Classed	Not Listed	Not Listed	Not Listed
13	Lacustrine Wetland	Not Classed	Not Listed	Not Listed	Not Listed
n/a	Potential Natural Grassland	RE 11.8.11	Of Concern	Of Concern	Endangered

* This community was considered to be equivalent with RE 11.4.9 in terms of species composition but did not satisfy all requirements that define remnant vegetation (i.e. >70% of the height and/or >50% of the cover relative to the undisturbed height and cover of a given RE). It is therefore not considered Endangered under the VM Act. Brigalow is neither dominant nor co-dominant; the community is therefore not considered Endangered under the EPBC Act.

Source: AARC 2013

Fauna

A combined total of 124 fauna species comprising 8 reptiles, 7 amphibians, 81 birds, and 28 mammals were recorded from the Project site during the terrestrial flora and fauna surveys.

Species of Conservation Significance

One avian species listed as Migratory under the *Environment Protection and Biodiversity Conservation Act 1999*, the Cattle Egret (*Ardea ibis*) was observed on the Project site during the survey periods. The distribution of this species is widespread throughout eastern Queensland, and the local population on the Project site is unlikely to constitute an 'ecologically significant proportion' of the total population of the species. Furthermore, the Project site is not at the limit of these species' range, nor are these species considered to be declining within the region. Therefore, it is unlikely the Project will have a significant impact on the regional population of Cattle Egrets.

The Little Pied Bat (*Chalinolobus picatus*), listed as 'Near Threatened' under Schedule 5 of the *Nature Conservation Wildlife Regulation 2006*, was identified on the Project site. Being a tree-hollow roosting species, important habitat for the Little Pied Bat would occur in areas that have a high density of old hollow-bearing trees. The Little Pied Bat forages in a wide range of vegetation communities, ranging from dry sclerophyll forest, woodland, inland scrub and riparian areas. Therefore, the Little Pied Bat as a species is unlikely to be impacted by the Project due to the large regional extent of suitable foraging habitat.

Pest Fauna

Six introduced pest fauna species were recorded on the Project site during the terrestrial flora and fauna surveys. These species include the Cane Toad (*Rhinella marina*), House Mouse (*Mus musculus*), Feral Cat (*Felis catus*), European Rabbit (*Oryctolagus cuniculus*), Feral Pig (*Sus scrofa*) and Dingo (*Canis familiaris dingo*). Of these species, the latter four are declared 'Class 2' pests under the *Land Protection (Pest and Stock Route Management) Act 2002*.



Under the *Land Protection (Pest and Stock Route Management) Act 2002*, land managers must take reasonable steps to ensure that lands are kept free of Class 2 pests. Given this legal requirement, in addition to the potential for these species to impact the environmental values of the Project site, management strategies for each of the Class 2 pests are addressed below:

1. Feral Cat: Control methods for feral cats include shooting, poisoning, trapping and fencing in combination with current land management practices and should be implemented on site as part of a Feral Pest Control Program;
2. European Rabbit: Poisoning is probably the most widely-used of the conventional techniques, as it requires the least effort. Shooting of rabbits is also a commonly used control method but has little impact on rabbit populations. Another widely accepted and utilised technique is the destruction of warrens through ripping, ploughing, blasting, and fumigating;
3. Feral Pig: Difficult to control, it is recommended that a combination of physical controls be employed, including shooting, poisoning, trapping and/or barrier construction. These controls should be implemented on site as part of a Feral Pest Control Program; and
4. Dingo / Wild Dog: Different control methods including shooting, poisoning, trapping and fencing in combination with current land management practices are most effective to control Dingoes and should be implemented on site as part of a Feral Pest Control Program.

POTENTIAL IMPACTS

Impacts on Flora

Potential Project impacts upon flora species and the integrity of vegetation communities include:

- Land clearing for the Project may reduce the current extent of vegetation communities and available habitat for certain flora species;
- Edge effects resulting from the proposed works can include the introduction and establishment of weeds, alteration to microclimatic conditions (such as greater light intensity, more wind penetration, lower humidity) and a reduction in plant health through loss of photosynthetic potential (as a result of plants being covered by dust generated from vehicle movement on unsealed tracks);
- Loss of integrity and connectivity in vegetation communities listed as having a high biodiversity status;
- The introduction of additional weed species and spread of weeds on the Project site via transport of seeds on vehicles and machinery;
- Land clearing activities associated with the Project may increase soil erosion, inadvertently causing siltation or sedimentation of riverine habitats and waterholes downstream. Soil erosion may also trigger a loss of nutrients to one area, causing a disruption of nutrient cycling; and
- The proposed work includes underground mining in part of the Project site. Although underground mining will cause some land subsidence, appropriate mitigation measures will be implemented throughout the Project life in order to minimise such impacts.



Dust Impacts to Adjacent Vegetation Communities

Community 4 (Brigalow Woodland) is located immediately east of the open-cut pit in the south of the Project site. Activities conducted at the pit will generate dust (including coal dust) that has the potential to impact vegetation. However, prevailing winds on the Project site originate from the north-northeast through to the east and southeast, influencing the prevailing direction of dust dispersal. Due to the location of Community 4 to the east of the pit, prevailing winds will minimise potential impacts of dust on vegetation.

Community 10 (Brigalow / Belah Low Open Woodland) is located immediately adjacent to a dam in the west of the Project site. The dam is expected to result in minimal dust generation, precluding any significant impact to this vegetation community.

Impacts on Fauna

The construction of mine infrastructure has the potential to affect fauna populations through habitat loss, population isolation, edge and barrier effects and increased mortality due to mining activities and increased traffic volumes.

The following potential Project impacts upon fauna may result from the proposed works on the Project site:

- Fauna injury or death may occur during the lifetime of the Project, with the greatest potential to occur during the construction phase;
- Loss of habitat may result in a loss of biological diversity (with associated removal of leaf litter, hollow bearing trees, fallen timber and resultant changes to soil biota);
- Vegetation clearing will result in a localised reduction in the amount of roost and nesting sites, microhabitats and potential foraging areas for many fauna species. This would add population pressure (such as competition for roost sites, mates and food resources) to resident fauna in adjacent areas and may potentially lead to decreased population viability;
- An increase of pest fauna species identified as utilising the Project site may occur, including the house mouse, cane toad, European rabbit, feral pig and feral cat and dingo. Increases in local pest fauna populations will impact on native fauna as a result of increased predation and competition for resources;
- Low-mobility species may be susceptible to a decline in their population. Species such as amphibians and smaller reptiles may become genetically isolated, if their habitat is disconnected;
- Increased lighting may affect both nocturnal and diurnal fauna. Additional lighting commonly attracts insects, which will result in a higher abundance of amphibians, microbats and reptiles ready to take advantage of concentrated prey; and
- An increase in noise, vibration and dust associated with the construction and operational phases of the Project may lead to the displacement of native species from their current home ranges.



Impacts on Species of Conservation Significance

Although one mammal species of conservation significance, the Little Pied Bat, was positively identified from AnaBat data recorded on the site, Project activities are not anticipated to impact the availability of habitat / forage resources and impede movements of the Little Pied Bat. In addition, the adjoining Fairbairn State Forest potentially provides suitable forage and roosting habitats.

Terrestrial fauna surveys on the Project site have also recorded the presence of one Migratory bird species, the Cattle Egret. Given the extensive distribution of this species throughout Australia and the presence of a significant wetland (i.e. Lake Maraboon) to the south of the Project site, the Project is not expected to have a significant impact on this species.

No flora species of conservation significance listed as threatened under the NC Act or EPBC Act were identified on the Project site. Therefore, the Project is not expected to impact on any flora species of conservation significance.

MANAGEMENT RECOMMENDATIONS

Potential environmental impacts resulting from the Project have been avoided and minimised, where possible, throughout the Project planning and design phases. To avoid disturbance to Fairbairn State Forest, the part of the original project area overlapping the State Forest was excised from the Project. Further, a 50 m buffer between Project activities and the boundary of the State Forest has been included in the design. It should be noted that there will also be ongoing opportunities to further avoid impacts at a local scale through the detailed design process.

Native vegetation removal should be conducted only after areas to be cleared have been clearly delineated and identified to equipment operators and supervisors and after clearance from environmental staff has been obtained.

Measures should be taken to minimise harm to affected fauna communities by inspecting the vegetation to be disturbed prior to clearing to ascertain whether any fauna are present. If fauna is present, it should be given the opportunity to move on naturally before clearing occurs.

If there is a risk that Little Pied Bat habitat will be disturbed by Project activities, the following management and protection actions are recommended:

- Fauna spotters that are experienced in the relocation of bats are to be present prior to and during vegetation clearing;
- Implementation of a staged approach to vegetation clearing to allow the bats to disperse freely;
- Retention and re-location of hollows;
- Undertaking a monitoring program to determine the presence of bats near blasting areas; and
- Design and implementation of a blasting program that is sensitive to the location of Little Pied Bat roost sites and their periods of breeding and nocturnal activity.

To maintain the integrity of vegetated land that is not cleared, appropriate erosion and sediment controls are recommended to prevent sediment deposition in retained habitats. Maintenance of retained areas of existing vegetation would also provide a source of seed for mine rehabilitation



works. It is recommended that the methodologies for the rehabilitation / re-vegetation works for the Project use the most appropriate species for the landscape elements of the site.

Conservationally significant vegetation communities which will be impacted by the Project (Community 4 and the Potential Natural Grassland Community) will require both State and Federal Environmental Offset strategies to be developed. The aim of these strategies is to contribute towards the long-term viability of the state's biodiversity.

Species chosen for revegetation should be selected from the lists provided in this report showing the dominant flora of each community. Areas such as the overburden emplacement should be assessed for species to ensure long-term stability and rehabilitation success. Re-created landforms should be contoured to resemble the original local topography.

A segment of the Staff Induction Program should be allocated to informing staff of the conservation values on the Project site and surrounding areas to increase staff awareness of the species present. This could include photographs, brief descriptions and management requirements of native species.



1.0 INTRODUCTION

AustralAsian Resource Consultants Pty Ltd (AARC) was commissioned by Shenhua International Group Pty Ltd (Shenhua) to conduct a Terrestrial Flora and Fauna Assessment of the proposed Taraborah Coal Project (the Project) for inclusion in the Project's Environmental Impact Statement (EIS).

This study provides an assessment for the presence of flora and fauna species on the Project site and the potential impacts that the proposed mining activities (construction, operation and decommissioning) may have upon the local biota.

The Project is a proposed new coal mining operation in Central Queensland. The Project site is located in the Central Highlands District of Central Queensland (within Queensland's Bowen Basin). The Project is focused on mining thermal coal deposits, by way of open-cut and underground mining, for which an EIS is being prepared. Shenhua currently holds an Exploration Permit for Coal (EPC) – EPC 1011 – which incorporates the Mine Development License (MDL 467) area. For the purposes of this study, MDL467 forms the Project site. The MDL area has been designed to minimise the Project site and area of potential disturbance whilst avoiding any disturbance to the adjoining Fairbairn State Forest. The Project proposes an eventual mining rate of approximately 2.1 – 2.3 Million tonnes per annum (Mtpa) ROM coal for the open-cut operation and 4.9 – 5.7 Mtpa for the underground operation, based on extraction techniques utilised. The development of an onsite Coal Handling and Preparation Plant (CHPP) is also proposed.

Three site visits to conduct flora and fauna surveys on the Project site were undertaken as part of this study. A dry season survey was conducted over nine consecutive days from 8th September to 16th September 2011. To complete the terrestrial flora and fauna assessment, a second survey was undertaken during the wet season from 28th February to 5th March 2012. A supplementary fauna survey was completed from the 7th – 8th August 2012, to detect additional bat species occurring on the Project site.

1.1 SCOPE OF STUDY

To assess the ecological values of flora and fauna communities within the Project site, the following scope of works was undertaken:

- Database searches to identify species of conservation significance known from the region (provided in Appendix A). This enabled these species to be targeted during the field survey component of the study;
- Field surveys employing standard methodologies to determine the composition of terrestrial flora and fauna species inhabiting the Project site, particularly species of conservation significance; and
- The preparation of a report to Shenhua describing the significant ecological features identified and outlining possible management strategies to reduce any foreseeable impact associated with proposed mining activities.



2.0 PROJECT DESCRIPTION

Sections 2.1 to 2.6 describe the relevant aspects of the Project site, including location, local geography, topography, local water courses, regional climate and current land uses.

2.1 PROJECT LOCATION

The Project site is located in the Central Highlands District of Central Queensland (within Queensland's Bowen Basin) approximately 258 kilometres (km) east of Rockhampton and 286 km south-west of Mackay. The closest residential area to the Project is the township of Emerald, located approximately 22 km east of the Project site. The regional location of the Project site is shown in Figure 1.



Figure 1 Regional location of the Taroborah Project Site



2.2 LOCAL WATERWAYS AND TOPOGRAPHY

The majority of the Project site is situated on undulating plains and hills, with a sandstone plateau to the far west. The Project site lies within the Fitzroy Basin catchment. The Project site is traversed by numerous ephemeral drainage lines and two primary ephemeral creeks. Figure 2 illustrates the topography and drainage of the Project site.

The main watercourse in the north of the Project site is Retreat Creek and in the south, Taraborah Creek. Both of these waterways flow in an easterly direction and ultimately flow into the Nogoa River, downstream of Fairbairn Dam, also known as Lake Maraboon.

There are several pastoral dams within the Project site, including one large dam in the centre of the site. Surface water within the Project site is used for stock drinking water.

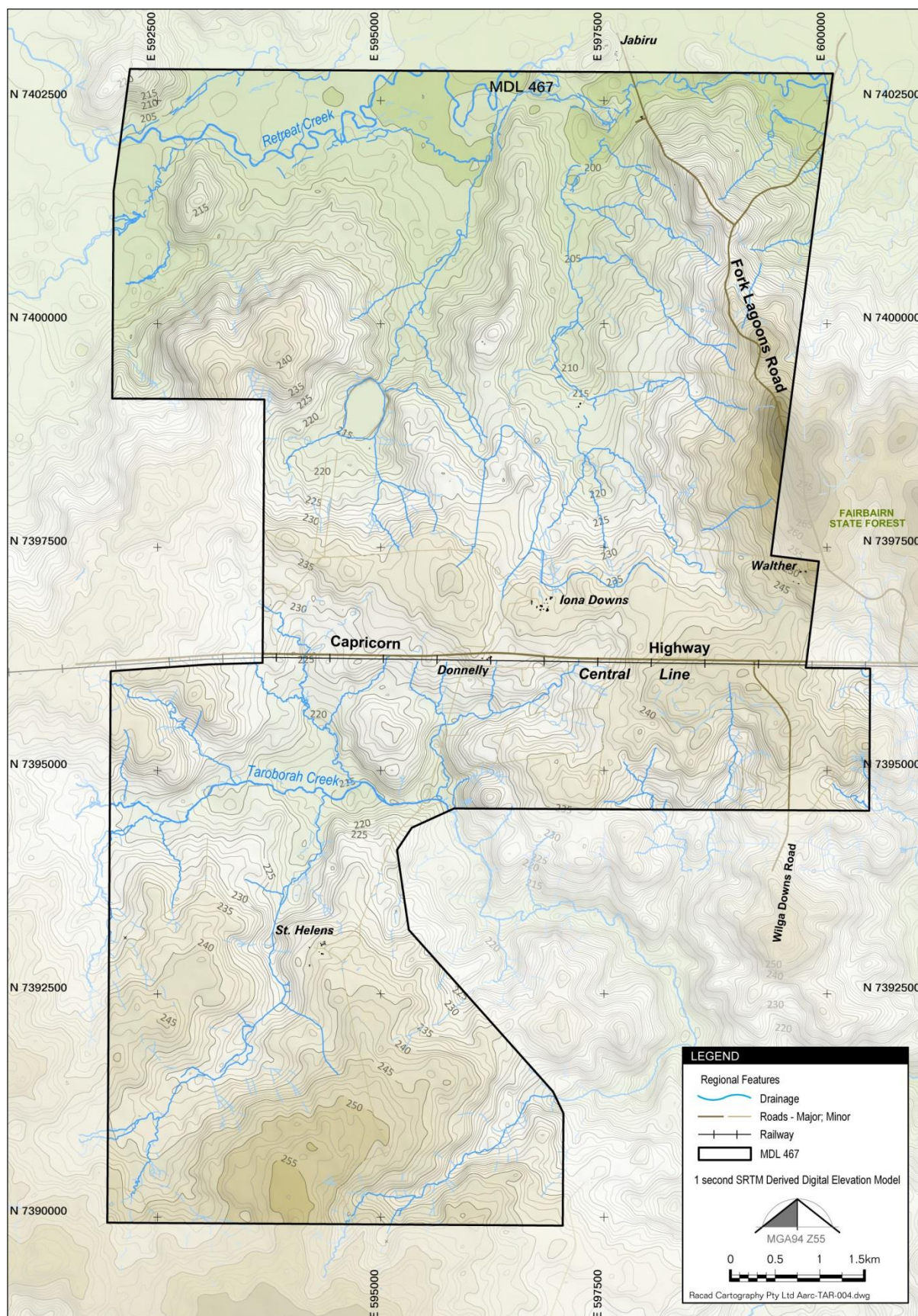


Figure 2 Local Topography and Watercourses of the Survey Area



2.3 GEOLOGY

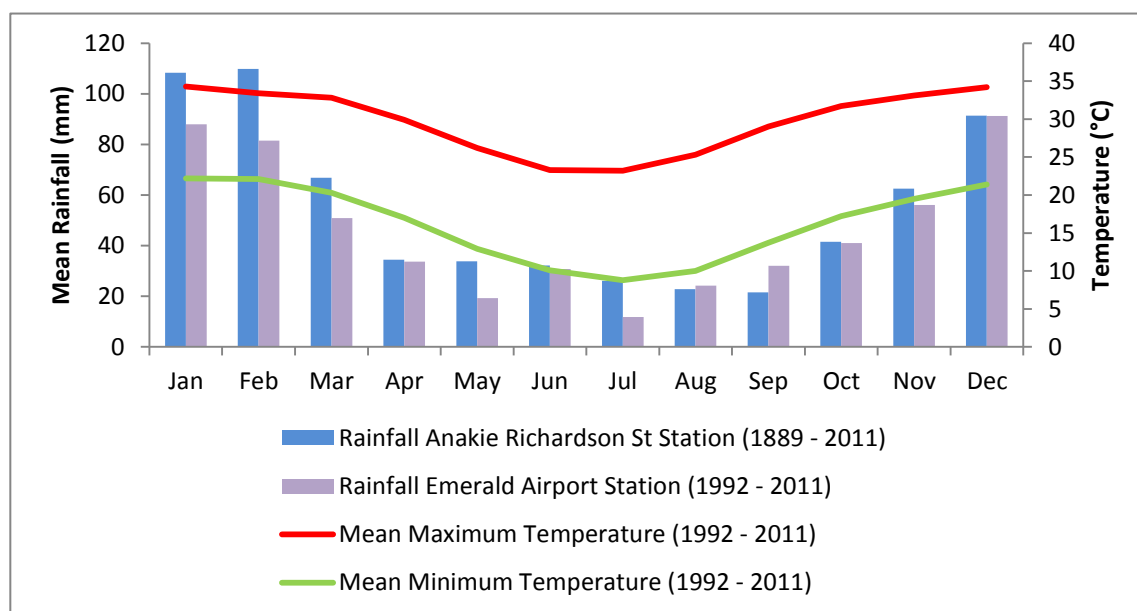
The Project site is located in the southwest part of the Bowen Basin. During the Permian period, the Bowen Basin was an area of shallow water or terrestrial sedimentation, providing conditions suitable for coal accumulation. The basin is made up of sedimentary troughs, which separate platforms and, on the western side, overlay older metamorphic rocks. The Project is located on the western edge of the Denison Trough and contains a substantial thickness of Permian sediments, overlain by Tertiary sediments.

2.4 REGIONAL CLIMATE

The climatic description of the region in which the Project site is located has been compiled using the regional data collected by Australia Bureau of Meteorology (<http://www.bom.gov.au/>). Climate data is sourced from the Emerald Airport Station (Station 035264), located approximately 24.6 km east-south-east of the Project site. Data from this station has been compiled since 1992. Supplementary rainfall data is sourced from the Anakie Richardson St Station (Station 35001). This station is closer to the Project site than Emerald Airport (located approximately 19.3 km west of the Project Site) and has a greater data bank (data compiled since 1889) but temperature data is not available from this station.

Data trends indicate that mean annual rainfall for the region is between 649.4 mm (Anakie Station) and 558.6 mm (Emerald Airport Station). Figure 3 shows that rainfall is highly seasonal, with the dry season peaking between July and September and the wet season peaking from December through to February.

July is the coolest month with mean minimum temperature of 8.8 degrees Celsius (°C) and mean maximum temperature of 23.2 °C, and January is the warmest month with mean maximum temperature 34.3 °C and mean minimum temperature 22.2 °C (Figure 3).



Source: BOM 2012

Figure 3 Rainfall and mean maximum and minimum daily temperatures for the Emerald-Anakie region

2.5 CURRENT LAND USE

Predominant land use activities on and surrounding the Project site include broadacre cropping and cattle grazing. Fairbairn State Forest occurs to the immediate south and east of the Project site and encompasses approximately 10,000 ha of remnant vegetation.

2.6 CONDITIONS PRIOR TO AND DURING THE SURVEYS

Data sourced from the Bureau of Meteorology Emerald Airport Station shows that 9 mm of rain fell in the two months previous to the commencement of the dry season survey (5th September 2011). The temperature range for this period was 3.2°C to 26.7°C.

Data from the Emerald Airport Station also revealed that a total of 93.8 mm of rain fell in the month leading up to the wet season survey. During the survey period a total of 0.8 mm of rain fell and temperatures ranged from 19.6°C to 34.8°C.

3.0 RELEVANT LEGISLATION

Legislation relevant to the assessment of flora, fauna and biodiversity on the Project site is discussed below.

3.1 COMMONWEALTH ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

Under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), an action will require approval from the Federal Environment Minister if the action has, will have, or is likely to have a significant impact on a Matter of National Environmental Significance, where a Matter of National Environmental Significance is:

- World Heritage properties;
- National Heritage places;
- RAMSAR wetlands of international importance;
- Listed threatened species and communities;
- Migratory species protected under international agreements;
- Nuclear actions;
- Water Resources impacted by large scale coal developments or coal seam gas projects; and
- The Commonwealth marine environment.

Of the above Matters of National Environmental Significance, three are applicable to the Project site:

- Listed threatened species and communities;
- Migratory species protected under international agreements; and
- Water Resources impacted by large scale coal developments or coal seam gas projects.

In addition, the EPBC Act provides for the identification and listing of key threatening processes.

As listed threatened species and communities, avian species identified as Migratory and water resources impacted by large scale coal projects were identified on the Project site, the Project has been referred under guidelines provided in the EPBC Act. These guidelines have been produced to assist industry and the public in interpreting the EPBC Act. The Project was referred to the Department of the Environment on the 18th January 2012. The referral decision was issued on the 20th February 2012. The referral decision was that the proposed action is a controlled action in which the Project will require assessment and approval under the EPBC Act before it can proceed. The referral decision determined that the Project will be assessed under the bilateral agreement with the Queensland government.



3.2 QUEENSLAND NATURE CONSERVATION ACT 1992

The most relevant portions of the *Nature Conservation Act 1992* (NC Act) to the Project site are the sections which pertain to Wildlife and Habitat Conservation. The classes of wildlife¹ to which the NC Act applies includes protected wildlife, which is defined as:

- Extinct in the wild wildlife;
- Endangered wildlife;
- Vulnerable wildlife;
- Near threatened wildlife; and
- Least concern wildlife.

Species listed under the above classes are published in the associated *Nature Conservation (Wildlife) Regulation 2006* (NCWR).

The NC Act defines 'threatening processes' as any process that is capable of:

- Threatening the survival of any protected area, area of major interest, protected wildlife, community of native wildlife or native wildlife habitat; or
- Affecting the capacity of any protected area, area of major interest, protected wildlife, community of native wildlife or native wildlife habitat to sustain natural processes.

The NC Act is relevant to the Project site should any protected² flora or fauna species (as detailed in the NCWR) be found on the Project site.

3.3 QUEENSLAND LAND PROTECTION (PEST AND STOCK ROUTE MANAGEMENT) ACT 2002

The objectives of the *Land Protection (Pest and Stock Route Management) Act 2002* (LP Act) are to consolidate, amend and provide laws for the management, control, prohibition, and regulation of the introduction, spread and keeping of certain plants and animals declared under the Act. The LP Act is relevant to the Project site in regards to the control and management of declared pest plant (weed) and animal species.

Classes of pests described in the LP Act include:

- *Class 1* – one that is not commonly present in Queensland, and if introduced would cause an adverse economic, environmental or social impact;
- *Class 2* – one that is somewhat established in Queensland and has, or could have, a substantial adverse economic, environmental or social impact; and

¹ Under the *Nature Conservation Act 1992*, Wildlife is defined to be any taxon of an animal, plant, protista, prokaryote, or virus.

² Under the *Nature Conservation Act 1992*, a protected plant is any threatened, near threatened or least concern wildlife. Similarly, protected fauna is defined as being any native wildlife prescribed under the Act.

- *Class 3* – extensive in Queensland and has, or could have, an adverse economic, environmental or social impact.

Under the LP Act, landholders must ensure that all reasonable steps have been taken to ensure the effective management of declared weeds and that they not be spread throughout the Project site.

3.4 QUEENSLAND VEGETATION MANAGEMENT ACT 1999

The *Vegetation Management Act 1999* (VM Act) was proclaimed on Thursday the 14th of September 2000 as part of a planning framework for the management of native vegetation across Queensland. The *Vegetation Management Regulation 2000* (VMR) prescribes the status of each Regional Ecosystem (RE) identified to occur within Queensland.

Although the VM Act does not apply to the clearing of vegetation on the Project site, the scientific basis for biodiversity conservation is still valid and can be used to assess the conservation significance of the vegetation communities on the Project site. This includes the conservation status categories of REs under the VM Act which are listed below, as is the definition of Remnant Vegetation:

Endangered Regional Ecosystems:

- <10% of pre-clearing extent remaining; and
- 10-30% of pre-clearing extent remaining and remnant <10,000 hectares (ha).

Of Concern Regional Ecosystems:

- 10-30% of its pre-clearing distribution remains; and
- 30% of the pre-clearing extent remains and the remnant vegetation remaining is <10,000ha.

No Concern at Present Regional Ecosystems:

- >30% of the pre-clearing distribution remains and remnant vegetation remaining is >10,000 ha.

Remnant Vegetation:

'Remnant Vegetation' for an area of Queensland for which there is no RE map or remnant vegetation map, means any vegetation where the predominant canopy:

- Covers more than 50% of the undisturbed predominant canopy;
- Averages more than 70% of the vegetation's undisturbed height; and
- Is composed of species characteristic of the vegetation's undisturbed predominant canopy.

3.5 QUEENSLAND ENVIRONMENTAL PROTECTION AGENCY BIODIVERSITY STATUS

The DEHP Biodiversity Status is the status assigned by the DEHP to REs to assist with biodiversity planning in Queensland. Unlike the status of REs under the VM Act, the DEHP Biodiversity Status is



based on an assessment of the condition of remnant vegetation in addition to the pre-clearing and extent of a regional ecosystem. It takes into account other threatening processes in addition to land clearing. Such processes include:

- The reduction in biodiversity within the REs;
- Weed invasion;
- Grazing pressures;
- Inappropriate fire management;
- Fragmentation; and
- Infrastructure development.

3.6 QUEENSLAND ENVIRONMENTAL OFFSETS ACT 2014

The *Environmental Offsets Act 2014* establishes a framework for implementing environmental offsets to counteract significant residual impacts to prescribed environmental matters arising from particular activities, including mining developments. Matters of national, state and local significance are recognised as prescribed environmental matters under the Act. The Act provides for the Queensland Environmental Offsets Policy, detailed below.

3.6.1 Queensland Environmental Offsets Policy

The main purpose of the *Queensland Environmental Offsets Policy 2014* (QEOP 2014) is to protect prescribed environmental matters where impacts will remain from development. Prescribed environmental matters include matters of national, state and local (where applicable) environmental significance. Offsets are required when an applicant has demonstrated that despite all efforts to avoid or minimise impacts on prescribed environmental matters there is still a significant residual impact.

The QEOP 2014 outlines the following principles for the establishment of offsets:

1. Offsets will not replace or undermine existing environmental standards or regulatory requirements, or be used to allow development in areas otherwise prohibited through legislation or policy;
2. Environmental impacts must first be avoided, then minimised, before considering the use of offsets for any remaining impact;
3. Offsets must achieve a 'conservation outcome' that achieves an equivalent environmental outcome;
4. Offsets must provide environmental values as similar as possible to those being lost;
5. Offset provision must minimise the time-lag between the impact and delivery of the offset;
6. Offsets must provide additional protection to environmental values at risk, or additional management actions to improve environmental values; and



7. Where legal security is required, offsets must be legally secured for the duration of the impact on the prescribed environmental matter.

An assessment of matters of state environmental significance (MSES) is required to determine exactly what values will need to be incorporated into the offset(s). MSES include (but are not limited to):

- Endangered and Of Concern RE, as per the VM Act, with the exception of REs listed in Schedule 5 of the VM Regulation 2012;
- Wetlands located in a Wetland Protection Area or shown as a High Ecological Significance Wetland on the Map of Referable Wetlands;
- RE located within the defining distance of a watercourse identified on the Vegetation Management Watercourse Map;
- RE intersecting an area identified as a wetland on the Vegetation Management Wetlands Map;
- RE intersecting an area identified as essential habitat on the Essential Habitat Map;
- RE containing areas that provide connectivity values necessary for ecosystem functioning. DEHP must be satisfied that the area of connectivity is of a sufficient size or appropriate configuration to maintain ecosystem functioning;
- Protected areas;
- Protected animals and plants under the NCWR 2006; and
- Legally secured offset areas as part of a prior activity.

3.6.2 Implementation of Offsets

There are two broad options for delivering environmental offsets: Proponent-driven Offsets and Financial Settlement Offsets.

Proponent-driven offsets include:

- Land-based Offsets; and
- Offsets delivered via Direct Benefit Management Plans.

Land-based offsets must:

- *Result in a 'conservation outcome';*
- *Be delivered on land owned by the authority holder; or*
- *Be delivered on land subject to a contractual arrangement between the authority holder, the offset provider and any other third party.*

The *Environmental Offsets Act 2014* states that a conservation outcome is said to be achieved if the offset is “selected, designed and managed to maintain the viability of the matter” (s11).



Financial settlement offsets utilise DEHP's calculation methodology to determine an appropriate offsets payment amount based on impacts to prescribed environmental matters. This method incorporates the on-ground and administrative costs of delivering the offset on behalf of the proponent, as well as landholder incentive payments. Once financial settlement has been reached, the proponent is considered to have fulfilled their offset obligations and DEHP becomes liable for the delivery of land-based conservation outcomes.

3.7 OFFSETS UNDER THE ENVIRONMENTAL PROTECTION AND BIODIVERSITY ACT 1999

The purpose of the draft policy *Use of Environmental Offsets under the Environment Protection and Biodiversity Conservation Act 1999* statement is to outline the Australian Government's position on the use of environmental offsets under the EPBC Act. Environmental offsets can be used under the EPBC Act to maintain or enhance the health, diversity and productivity of the environment as it relates to matters protected by the EPBC Act.

Environmental offsets can be applied as an approval condition under the EPBC Act for developments that have undergone assessment. They may be used when a development will result in impacts on a matter protected by the EPBC Act. Environmental offsets are not applicable to all approvals under the EPBC Act. Offsets should not be applied where the impacts of a development are considered to be minor in nature or could reasonably be mitigated. In some circumstances suitable offsets may not be available to adequately compensate for the impacts of a development and a decision on the overall acceptability of the project will need to be made.

Eight principles have been identified by the Australian Government for the use of environmental offsets under the EPBC Act. These principles are used in assessment of any proposed environmental offsets. The eight principles include:

1. Environmental offsets should be targeted to the matter protected by the EPBC Act that is being impacted.
2. A flexible approach should be taken to the design and use of environmental offsets to achieve long-term and certain conservation outcomes which are cost effective for proponents.
3. Environmental offsets should deliver a real conservation outcome.
4. Environmental offsets should be developed as a package of actions – which may include both direct and indirect offsets.
5. Environmental offsets should, as a minimum, be commensurate with the magnitude of the impacts of the development and ideally deliver outcomes that are 'like for like'.
6. Environmental offsets should be located within the same general area as the development activity.
7. Environmental offsets should be delivered in a timely manner and be long lasting.
8. Environmental offsets should be enforceable, monitored and audited.



4.0 DATABASE SEARCHES

Database searches collate information on flora and fauna species identified in the region from previous surveys, community records and other sources. A review of such databases facilitates the formulation of specific field survey techniques to target certain flora and fauna species known from the region. The results of these database searches revealed that numerous flora and fauna species of conservation significance are known to exist in the Project region, as discussed below. Database search results are included in Appendix A.

4.1 FLORA

4.1.1 Species of Conservation Significance

The following databases were searched for historical records of flora species within an area, defined by a 100 x 100 km square centred on a central point within the Survey Area (23° 32' 7.0794" S, 147° 56' 8.016" E).

EPBC Act Protected Matters Search Tool: This database provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act for a nominated area.

Queensland Herbarium Plant Specimen Database (HERBRECS): This database provides information including taxon names and specimen data.

Wildlife Online Database (DEHP): This database uses records collected from previous surveys including the Queensland Museum surveys as well as records from the public. While screening of data occurs, incorrect identifications are possible.

Review of database searches indicated the potential presence of eight plant species of conservation significance, listed under either the Commonwealth EPBC Act or the Queensland NCWR. Details on these species and their habitat requirements are provided in Table 1. Complete results from the database searches are provided in Appendix A.

Table 1 Flora Species of Conservation Significance, their Habitat Requirements and Potential to Occur on the Project Site

Name	Status		Habitat Requirements	Potential to Occur on Site
	NC Act	EPBC Act		
Dicotyledons				
<i>Cadellia pentastylis</i> Ooline	V	V	Ooline occupies dry rainforest, semi-evergreen vine thickets and sclerophyll communities and often occurs as locally dominant or emergent (DSEWPC 2008).	Suitable habitat for this species has not been identified on the Project site. Extensive areas of remnant vegetation within Fairbairn State Forest may provide suitable habitat for this species.
<i>Cymbonotus maidenii</i>	E	-	Occurs on black, brown or grey heavy cracking clay generally in open grasslands, along roadsides and in association with watercourses (Holland & Funk 2006).	Suitable habitat for this species occurs on the Project site. Given the extent of suitable habitat in the region, the Project is not expected to have a significant impact on this species in the event that it does occur on site.
<i>Eucalyptus sicilifolia</i>	V	-	This species is restricted to range country near Springsure, approximately 65 km south of Emerald (Lester 2008).	Given that the Project site exhibits a relatively flat to gently undulating terrain, it is unlikely that this species occurs on site.
<i>Marsdenia brevifolia</i>	V	V	This plant occurs on serpentine rock outcrops or crumbly black soils derived from serpentine in eucalypt woodland or in woodlands on granite soils (DSEWPC 2008).	Surveys of the Project site failed to detect any areas of suitable habitat for this species.
<i>Wahlenbergia islensis</i>	NT	-	Grows in crevices on rock outcrops and on sandstone at Isla Gorge and Chesterton Range (Smith 1992).	Suitable habitat for this species does not occur on the Project site.
Monocotyledons				
<i>Aristida annua</i>	V	V	This species is restricted to eucalypt woodland on black clay and basalt soils. It also occurs in the Natural grasslands of the Queensland Central Highlands and the northern Fitzroy Basin threatened ecological community (DSEWPC 2012).	Suitable habitat for this species may occur on the Project site.
<i>Cyperus clarus</i>	V	-	This species occurs in grassland or open woodland, in heavy soils derived from basalt (Wilson 2012).	Suitable habitat for this species may occur on the Project site and broader locality.
<i>Dichanthium queenslandicum</i> king blue-grass	V	V	Endemic to Queensland where it occurs on black clay soils around Emerald and more rarely on the	Suitable habitat for this species occurs on the Project site and broader



Name	Status		Habitat Requirements	Potential to Occur on Site
	NC Act	EPBC Act		
			Darling Downs (Simon & Alfonso 2011).	region.
<i>Dichanthium setosum</i>	NT	V	Occurs in grassy woodland and open forests. Associated with heavy basaltic black soils and stony red-brown hard-setting loam with clay subsoil and is found in moderately disturbed areas such as cleared woodland, grassy roadside remnants, grazed land and highly disturbed pasture (DSEWPC 2008).	Suitable habitat for this species potentially occurs on the Project site and broader region.
<i>Digitaria porrecta</i> finger panic grass	NT	-	Finger panic grass generally occupies grasslands on extensive basaltic plains, as well as undulating woodlands and open forests with an underlying basaltic geology. It usually occurs on dark and fine textured soils with some degree of seasonal cracking. It also persists in disturbed habitats, such as fallow paddocks, stock routes and road verges (DSEWPC 2008).	The Project site and surrounding lands are likely to provide suitable habitat for this species.

Source: AARC 2012

4.1.2 Regional Ecosystems

Regional Ecosystems potentially occurring within the Project site were found by combining information obtained from the following sources:

DEHP Regional Ecosystem Maps: Up to date spatial data can be obtained from this website, including maps of remnant vegetation and Regional Ecosystems within a specified area.

Regional Ecosystem Description Database (REDD): This database provides information about each RE defined by DEHP, including a description, the DEHP Biodiversity Status and status under the NCWR.

EPBC Act Protected Matters Search Tool: This database provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act for a nominated area, including Threatened Ecological Communities.

Species Profile and Threats (SPRAT): This database provides information about species and ecological communities listed under the EPBC Act.

Threatened Ecological Communities are defined by the Commonwealth EPBC Act. Unlike the Queensland equivalent (Regional Ecosystems defined by the NCWR), Threatened Ecological Communities do not have an assigned identification number or compatible description that allows a Commonwealth listed Community to be easily matched to the corresponding Queensland RE. In this report, remnant vegetation communities are described by an unofficial title (i.e. assigned by AARC, not published in the NWCR or EPBC Act) and DEHP RE identification number. Where relevant,



Threatened Ecological Communities are matched to their RE counterpart by the description of the component vegetation given in the REDD and SPRAT databases.

Desktop research revealed the possible presence of 14 remnant vegetation communities of conservation significance listed under Queensland and Commonwealth legislation. These communities are listed in Table 2 below.

Table 2 Remnant vegetation communities potentially occurring on the Project Site

RE ID	Description	EPBC Act Status	NCWR Status	DEHP Biodiversity Status
11.3.1	<i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest on alluvial plains (REDD); Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant) (EPBC Act)	Endangered	Endangered	Endangered
11.3.2	<i>Eucalyptus populnea</i> woodland on alluvial plains (REDD); Weeping Myall Woodlands (EPBC Act)	Endangered	Of concern	Of concern
11.3.25	<i>Eucalyptus tereticornis</i> or <i>E. camaldulensis</i> woodland fringing drainage lines (REDD)	-	Least concern	Of concern
11.3.3	<i>Eucalyptus coolabah</i> woodland on alluvial plains (REDD)	-	Of concern	Of concern
11.4.2	<i>Eucalyptus</i> spp. and/or <i>Corymbia</i> spp. grassy or shrubby woodland on Cainozoic clay plains (REDD)	-	Of concern	Of concern
11.4.8	<i>Eucalyptus cambageana</i> woodland to open forest with <i>Acacia harpophylla</i> or <i>A. argyrodendron</i> on Cainozoic clay plains (REDD)	-	Endangered	Endangered
11.4.9	<i>Acacia harpophylla</i> shrubby open forest to woodland with <i>Terminalia oblongata</i> on Cainozoic clay plains (REDD); Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant) (EPBC Act)	Endangered	Endangered	Endangered
11.8.5	<i>Eucalyptus orgadophila</i> open woodland on Cainozoic igneous rocks (REDD)	-	Least concern	No concern at present
11.8.11	<i>Dichanthium sericeum</i> grassland on Cainozoic igneous rocks (REDD); Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin (EPBC Act)	Endangered	Of concern	Of concern
11.9.1	<i>Acacia harpophylla-Eucalyptus cambageana</i> open forest to woodland on fine-grained sedimentary rocks (REDD)	-	Endangered	Endangered
11.10.3	<i>Acacia catenulata</i> or <i>A. shirleyi</i> open forest on coarse-grained sedimentary rocks. Crests and scarps (REDD)	-	Least concern	No concern at present



RE ID	Description	EPBC Act Status	NCWR Status	DEHP Biodiversity Status
11.10.7	<i>Eucalyptus crebra</i> woodland on coarse-grained sedimentary rocks (REDD)	-	Least concern	No concern at present
11.10.12	<i>Eucalyptus populnea</i> woodland on medium to coarse-grained sedimentary rocks (REDD)	-	Least concern	No concern at present
11.11.2	<i>Acacia shirleyi</i> or <i>A. catenulata</i> low open forest on old sedimentary rocks with varying degrees of metamorphism and folding (REDD)	-	Least concern	No concern at present

Source: AARC2012

4.2 FAUNA

4.2.1 Threatened Species

The following databases were searched for historical records of fauna species within an area, defined by a 100 km x 100 km square centred on a central point within the Survey Area (23° 32' 7.0794" S, 147° 56' 8.016" E).

EPBC Act Protected Matters Search Tool: This database provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act for a nominated area.

Wildlife Online Database (DEHP): This database uses records collected from previous surveys, including the Queensland Museum surveys as well as records from the public. While screening of data occurs, incorrect identifications are possible.

Review of database searches indicated the potential presence of 24 threatened species in the region of the Project site. These species are listed in Table 3 below.

Table 3 Threatened fauna species potentially occurring on the Project Site

Scientific Name	Common Name	Conservation Status	
		NC Act	EPBC Act
Amphibians			
<i>Cyclorana verrucosa</i>	Rough Collared Frog	Near Threatened	-
Birds			
<i>Accipiter novaehollandiae</i>	Grey Goshawk	Near Threatened	-
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	Near Threatened	-
<i>Erythrotriorchis radiatus</i>	Red Goshawk	Endangered	Vulnerable



Scientific Name	Common Name	Conservation Status	
		NC Act	EPBC Act
<i>Geophaps scripta scripta</i>	Squatter Pigeon (southern)	Vulnerable	Vulnerable
<i>Melithreptus gularis</i>	Black-chinned Honeyeater	Near Threatened	-
<i>Neochmia ruficauda ruficauda</i>	Star Finch (eastern), Star Finch (southern)	-	Endangered
<i>Nettapus coromandelianus</i>	Cotton Pygmy-goose	Near Threatened	-
<i>Phaethon rubricauda</i>	Red-tailed Tropicbird	Vulnerable	-
<i>Rostratula australis</i>	Australian Painted Snipe	Vulnerable	Vulnerable
<i>Tadorna radjah</i>	Radjah Shelduck	Near Threatened	-
Mammals			
<i>Chalinolobus picatus</i>	Little Pied Bat	Near Threatened	-
<i>Dasyurus hallucatus</i>	Northern Quoll	-	Endangered
<i>Nyctophilus timoriensis</i> (South-eastern form)	Greater Long-eared Bat, South-eastern Long-eared Bat	-	Vulnerable
Reptiles			
<i>Acanthophis antarcticus</i>	Common Death Adder	Near Threatened	-
<i>Delma torquata</i>	Collared Delma	-	Vulnerable
<i>Denisonia maculata</i>	Ornamental Snake	Vulnerable	Vulnerable
<i>Egernia rugosa</i>	Yakka Skink	Vulnerable	Vulnerable
<i>Furina dunmalli</i>	Dunmall's Snake	-	Vulnerable
<i>Hemiaspis damelii</i>	Grey Snake	Endangered	-
<i>Lerista allanae</i>	Allan's Lerista, Retro Slider	-	Endangered
<i>Paradelma orientalis</i>	Brigalow Scaly-foot	Vulnerable	Vulnerable
<i>Rheodytes leukops</i>	Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle	Vulnerable	Vulnerable
<i>Strophurus taenicauda</i>	Golden-tailed Gecko	Near Threatened	-

Source: AARC2012



4.2.2 Migratory Bird Presence

Database searches revealed a total of 11 Migratory or Marine bird species known to inhabit or pass through the Project site and surrounding area, which are listed below in Table 4. A full list of these species including their habitat requirements and migrating patterns is provided in Appendix B.

Table 4 Migratory or Marine species potentially occurring on the Project Site

Scientific Name	Common Name	Migratory Species			Listed Marine Species
		Marine	Terrestrial	Wetland	
<i>Anseranas semipalmata</i>	Magpie Goose				X
<i>Apus pacificus</i>	Fork-tailed Swift	X			X
<i>Ardea alba</i>	Great Egret, White Egret	X		X	X
<i>Ardea ibis</i>	Cattle Egret	X		X	X
<i>Gallinago hardwickii</i>	Latham's Snipe, Japanese Snipe			X	X
<i>Haliaeetus leucogaster</i>	White-bellied Sea-eagle		X		X
<i>Hirundapus caudacutus</i>	White-throated Needletail		X		X
<i>Merops ornatus</i>	Rainbow Bee-eater		X		X
<i>Myiagra cyanoleuca</i>	Satin Flycatcher		X		X
<i>Nettapus coromandelianus albipennis</i>	Australian Cotton Pygmy-goose			X	X
<i>Rostratula benghalensis</i> s. lat. *	Painted Snipe			X	X

*indicates this species is also listed as Vulnerable under the EPBC Act.

Source: AARC2012

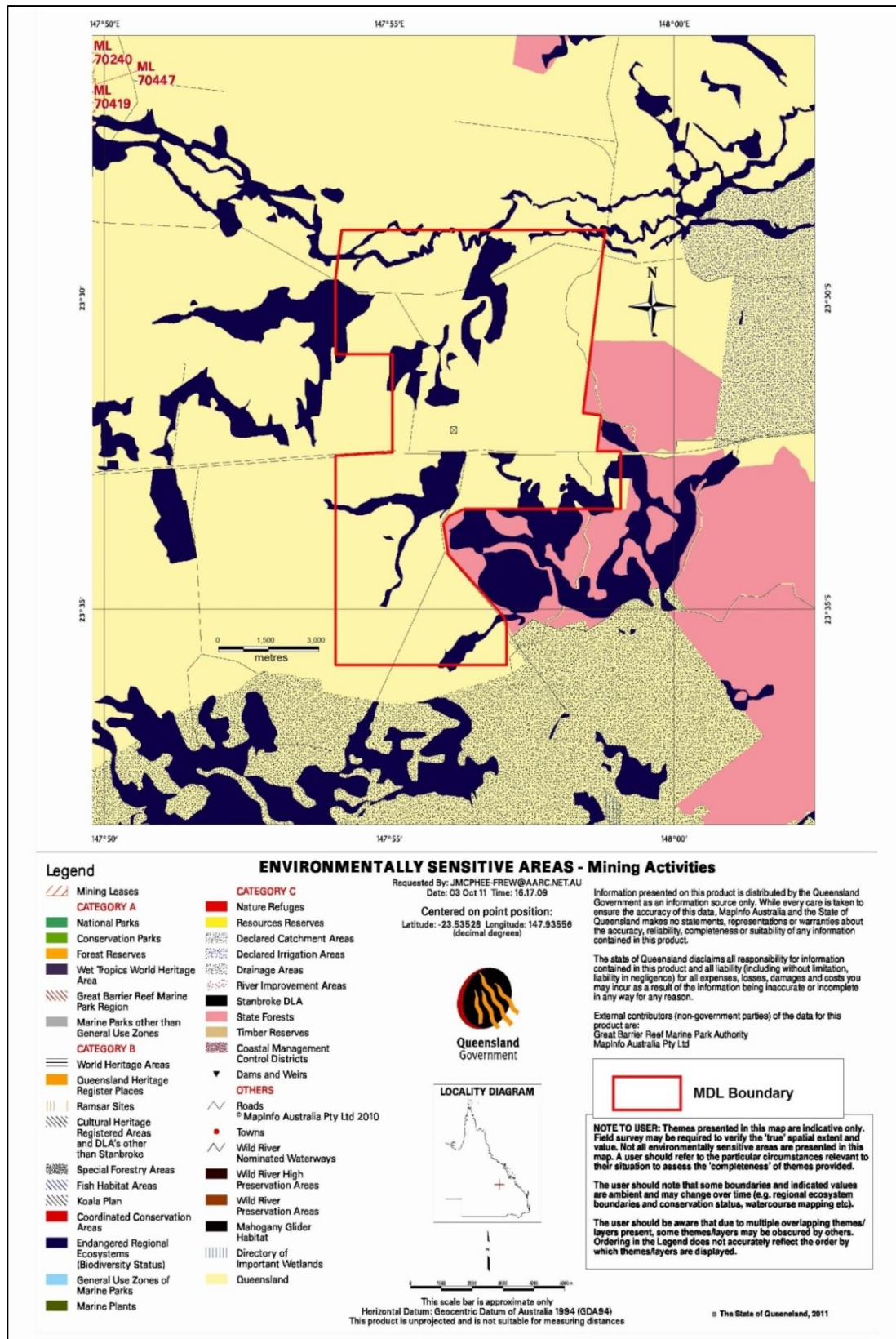
4.3 ENVIRONMENTALLY SENSITIVE AREAS

Environmentally Sensitive Area (ESA) mapping presents Category A, B, and C areas of conservation significance and areas listed under the Directory of Important Wetlands.

A review of DEHP's Environmentally Sensitive Areas mapping revealed that the Project site does not contain conservation parks, declared fish habitat areas, wilderness areas, aquatic reserves, heritage or historic areas, national estates, world heritage listings, sites listed by international treaties or agreements or areas of cultural significance relating to biodiversity and scientific reserves.

The Project site does contain areas listed as Endangered Regional Ecosystems (DEHP Biodiversity Status) (Figure 4).





Source: QLD Gov. 2012

Figure 4 Environmentally Sensitive Areas on the Project Site



5.0 FIELD SURVEY METHODOLOGY

A site visit of nine consecutive days to conduct a dry season terrestrial flora and fauna assessment across the Project site was undertaken from 8th to 16th September 2011. A wet season terrestrial flora and fauna survey was completed between the 28th of February and 5th March 2012 to conclude the assessment and provide a comprehensive description of the terrestrial flora and fauna of the Project site. A targeted survey for bats was completed over a period of 2 days from the 7th to 8th of August 2012.

The flora and fauna survey methods are discussed in Sections 5.1 to 5.3.3.

5.1 INITIAL SITE SCOPING

Site scoping was conducted using two methods. Firstly, aerial photography and Regional Ecosystem (RE) maps of the Project site were reviewed to gain an overall perspective of the vegetation distribution.

Secondly, accessible areas of the Project site were broadly surveyed from a vehicle. This allowed for the targeting of habitats potentially occupied by species of conservation significance, and enabled survey transects to be located in areas that maximised the sampling of representative vegetation types and habitats within the Project site.

5.2 FLORA

5.2.1 Overall Approach

The field survey involved a baseline study of the Project using standard floristic survey methods. Methods used were in accordance with the Queensland Herbarium *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland* (Version 3.1) (Neldner *et al.* 2005).

The Queensland Herbarium Methodology describes the following levels of sampling which were used in the field surveys:

- *Secondary* – Consists of 20 x 50 m plots. Data recorded in these transects includes a list of all species observed from all the major layers of vegetation. Species that fall outside the plot but are typical of the community are also listed. In addition, relative abundance for individual species in each strata is recorded, including density and foliage projection cover and height for the tree and shrub layers; and
- *Quaternary* or observation sites – These plots include Global Positioning System (GPS) location, the dominant species in the characteristic layer, with some landform and structural data. An intuitive classification of the vegetation is also recorded. These plots are commonly used in the ground truthing of mapping previously completed for the local area.

Field data collected using this methodology is compatible with the Queensland Herbarium CORVEG database for field data, as defined in *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland* (Neldner *et al.* 2005). Example flora pro-formas are attached in Appendix C. The level of assessment used in this study is discussed below in Sections 5.2.2 to 5.2.7.



5.2.2 Regional Ecosystem Mapping

The flora survey employed a desktop assessment of floral taxa and vegetation communities of the Project Site prior to the commencement of field work. Preliminary identification included vegetation community definition from aerial photography. This preliminary community identification was used to target locations for representative field survey sample plots to obtain floristic and structural data and ground truth communities.

A survey of all potential REs on the Project was conducted to supplement the Queensland Herbarium RE mapping. Consequently, the following methods were used:

- A number of *Secondary* transects (50 x 20 m plot) in each vegetation type were selected and a detailed floristic inventory of the dominant and associated woody plants (i.e. trees and shrubs) was undertaken. Secondary plots were positioned in vegetation representative of the community as a whole;
- In addition to the *Secondary* transects, a number of *Quaternary* transects were surveyed in order to assist with the mapping of REs, to capture any variation in species composition and community structure and to search for threatened species known to occur in the region;
- An assessment of the condition of the vegetation type with regard to quality and conservation value was undertaken at each transect; and
- The mapping of vegetation was undertaken through the use of aerial photographs, geological maps, and the use of a GPS in association with the findings of the field survey. Vegetation transects were conducted until additional transects yielded no significant additional species or structural variation.

5.2.3 Air Photo Interpretation

Aerial photo interpretation was conducted to delineate stands of potentially homogenous vegetation structure and composition, and to annotate those stands with data attributes that can be used to quantify and describe the current condition of vegetation. Aerial photography was interpreted and classed into visually identifiable patterns over the Project site as an initial, broad scale interpretation prior to the commencement of the initial field survey.

The field assessment was then designed to sample the different classes identified in the aerial photograph interpretation. Secondary and Quaternary transects were placed within polygons of vegetation to ground truth the aerial photography and to sample the variations between the aerial photography and classes of vegetation found on ground.

5.2.4 Survey for Species of Conservation Significance

Where suitable habitat for species of conservation significance was identified within the Project site, targeted searches for that species were undertaken. Targeted searches involved the use of the random meander technique discussed in the *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities* (DEC 2004).

As the name suggests, the random meander technique involves traversing areas of suitable habitat in no set pattern whilst searching for the particular plant species. This method can allow for greater coverage than a plot-based survey and is less time consuming. If there was any uncertainty in



identifying the species, a voucher specimen was collected for confirmation by the Queensland Herbarium.

5.2.5 Plant and Regional Ecosystem Identification

All dominant plants representative of each vegetation community were identified using a number of taxonomic keys and other reference material. All REs were described in accordance with the Regional Ecosystem Descriptions Database (REDD). The use of the terms 'Remnant' and 'Non-remnant Vegetation' were as per the VM Act. For any plant species that could not be identified in the field, a sample was collected and sent to the Queensland Herbarium for identification.

5.2.6 Mixed Polygons

A polygon shown on an RE map usually denotes a discrete area of one type of vegetation community. The scale at which an RE map is produced dictates the minimum area of continuous vegetation type that can be represented by one polygon. This is known as the "minimum mappable area". If distinct vegetation communities are smaller than this minimum area, then vegetation communities are put together in "mixed polygons". This has the consequence that when Land zone maps are combined with vegetation maps to produce REs, mixed polygons containing more than one RE can be produced. Where mixed polygons are represented on an RE map, all REs represented within the polygon are denoted

5.2.7 Flora Transects Surveyed

Flora transects were conducted in each community found within the Project Site. The locations of these transects are shown in Figure 5. In addition to the transect study locations, incidental observations of flora species were recorded with notes on the vegetation community as they were encountered.

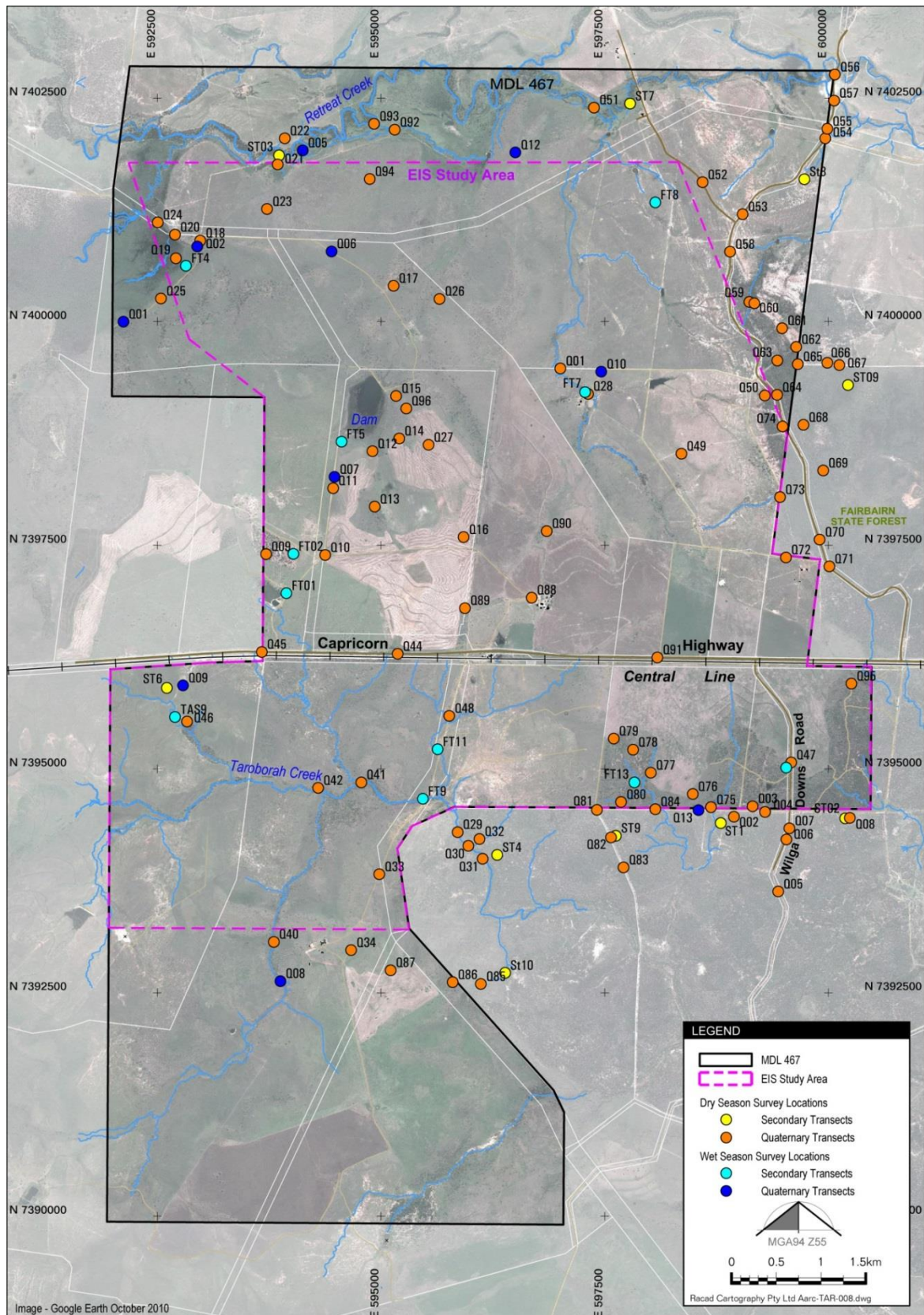


Figure 5 Flora Transect Locations within the Project Site

5.3 FAUNA

The fauna sampling methodology for the Project Site was based on survey techniques prepared by Freeman (2009), titled *Recommended Fauna Survey Methodology for Environmental Impact Assessments*. Sampling of vertebrate fauna was conducted primarily along transects established in each of the major fauna habitat types and at changes in vegetation community groups. Secondary sites were established to provide important information on fauna species associated with preferred habitat, as well as increasing the chances of finding species of conservation significance. Their inclusion in the assessment provides a more robust survey methodology and greater survey coverage. Sampling locations are shown in Figure 6. Descriptions and photographs of the sites are provided in Appendix D.

At each of the standard trapping sites the following survey methods were used:

- Habitat assessment;
- Pitfall trapping;
- Elliott trapping;
- Ultrasonic bat detection (AnaBat);
- Funnel trapping;
- Spotlighting; and
- Active searching.

5.3.1 Nomenclature

Many fauna species, particularly frogs and reptiles, do not have widely accepted common names. Where possible, the accepted common names of wildlife will be used preferentially in this report, with scientific names stated on all other occasions.

Nomenclature within this report follows the following references:

- DEHP WildNet Database (2012) for bird, reptile, amphibian and mammal species;
- Simpson and Day (2010) for birds;
- Tyler and Knight (2009) for amphibians;
- Wilson (2005) for reptiles;
- Cogger (2000) for reptiles and amphibians; and
- Menkhorst and Knight (2004) for mammals.



5.3.2 Detection Methods

A description of the techniques employed to survey the fauna occurring on the Project site is provided below. Trapping was conducted at five sampling sites over four consecutive nights during the September 2011 and February-March 2012 surveys. Appropriate combinations of the listed trapping methods were used to maximise chances of surveying all fauna.

Elliott trapping

Type A Elliott traps were used to target small ground-dwelling mammals inhabiting the Project site. Traps were baited with a mixture of rolled oats, peanut butter and vanilla essence. At each Fauna Site, 20 Elliott traps were set at least 10 m apart along a transect. The spacing of the traps and the location of the transect were flexible so that the traps could be set in optimal microhabitats that were most likely to trap small animals, for example along fallen logs. Given that the traps were active for four nights at five sampling sites, a total survey effort of 400 Elliott trap nights was achieved during each survey period.

Pitfall trapping

A pitfall trap-line was established at all primary transects to target small ground-dwelling fauna (reptilian, mammalian and amphibian). Each line consisted of a 20 cm tall rigid plastic drift fence running along the ground and crossing the middle of five 20 litre buckets buried flush with the ground. The bottoms of drift fences were buried slightly to guide target species towards a bucket. A small amount of soil and leaf litter and a small piece of PVC pipe was placed in the bottom of each bucket to provide a floating device in case of significant rain and shelter for captured wildlife. Trap-lines were checked each morning and evening. Each pitfall-line was operational for four consecutive nights. A total sampling effort of 100 pitfall trap nights was achieved during each survey period.

Funnel trapping

Funnel traps were employed to catch medium and large-sized terrestrial, diurnal snakes and some of the widely foraging, medium-sized skinks, dragons and arboreal geckos, which are able to climb out of pitfall traps. Funnel traps were placed at the end of each drift fence at the pitfall trap-lines and along fallen timber at secondary trap sites. Total funnel trap effort for each survey was 80 trap nights.

Micro-bat surveying

Micro-bats (Microchiropterans) form an extremely diverse group of wildlife and the identification of individual species requires the use of specialised survey methods due to the superficial similarity of many species, their small size, and largely inaudible calls.

In order to navigate and hunt at night, micro-bats use high frequency echolocation calls, most of which are above the frequency range audible to humans (i.e. ultrasound). These echolocation calls provide an opportunity to unobtrusively survey and identify micro-bats through the use of a specialised electronic bat call recorder called AnaBat. The AnaBat was utilised throughout surveys, recording micro-bat calls at each vegetation community. This method therefore represents a broad census technique, which facilitates the detection of a broad suite of micro-bats that utilise the Project site and surrounding areas. Recordings were sent to an expert AnaBat call analyst (Mr Greg Ford – Toowoomba, Queensland) for species identification. The overall AnaBat survey effort was completed over 4 nights during the dry season, with sampling completed at four locations. Data was collected at one site over one night during the wet season and at five sites over a period of 2 nights on the 7th and 8th August 2012.



Bird surveying

A dedicated search for diurnal birds was conducted visually and aurally on mornings and afternoons of the survey in the immediate vicinity of each fauna transect. In addition, opportunistic diurnal searches were also conducted on foot in areas considered likely to have high avian diversity (e.g. vegetated creek lines, dams), or to contain cryptic or threatened bird species.

Spotlighting

Spotlighting was carried out at night in various sections of the Project site and surrounding areas in an attempt to observe nocturnal wildlife not likely to be detected by other survey methods, such as owls and arboreal mammals. Two spotlighting techniques were employed:

Walk searches: Various habitats surrounding and within the Project site were selected for spotlighting on foot, especially those considered likely to have high wildlife diversity or to contain cryptic or threatened species. These areas were randomly traversed by two ecologists equipped with spotlights and binoculars. Where possible, rock fissures, bark crevices and tree hollows were investigated. A slow walking speed (approximately 1 km per hour) was maintained to facilitate intensive listening and thorough visual searching. While this technique improves the likelihood of detecting small cryptic species, it is a time consuming activity that does not permit the coverage of large areas. The total spotlight hours undertaken on foot within and surrounding the Project site was 16 hours.

Vehicle searches: Spotlighting was also conducted from a slow-moving vehicle where established roads/tracks permitted driving through areas considered likely to have high wildlife diversity or to contain cryptic or threatened species. A 55 watt, 12 volt spotlight was used to scan roadside vegetation for arboreal and ground-dwelling wildlife. An advantage of this survey technique is the efficiency with which large areas can be covered, although small cryptic species can be easily overlooked. A total of 2 hours of vehicle spotlighting was undertaken throughout the course of all surveys.

Habitat searching

To further enhance the likelihood of detecting small cryptic species, opportunistic diurnal searches of likely micro-habitats were conducted at each transect and in other selected areas surrounding the Project site. Searches involved the rolling of rocks and logs, rustling through leaf litter, and the peeling back of exfoliating bark from standing trees. Observed animals were captured where possible to aid positive species identification, then immediately released.

Scat/Track searching

At each transect location; a search of the immediate area was conducted for evidence of the presence of cryptic wildlife species through the identification of obvious tracks, scats and other signs of occupation (e.g. scratches on tree trunks).

Incidental recordings

Throughout the survey period, numerous wildlife species were observed or heard within the Project site during the course of routine activities, such as setting and checking trap-lines, or driving between transects. Where required, a closer inspection of detected wildlife was carried out to ensure positive species identification. All incidental observations were recorded and appropriate notes made on the surrounding habitat.



5.3.3 Fauna Transect locations

Five primary fauna transects were established within the Project site during both the wet season and dry season surveys. AnaBat detectors were set up at four additional sites during the supplementary (August 2012) survey. The location of fauna transects and supplementary AnaBat survey sites are shown in Figure 6. The sites were chosen based on habitat values and sampling in different habitat types within the Project site to maximise the detection of terrestrial fauna in each of the different ecotones of the site.

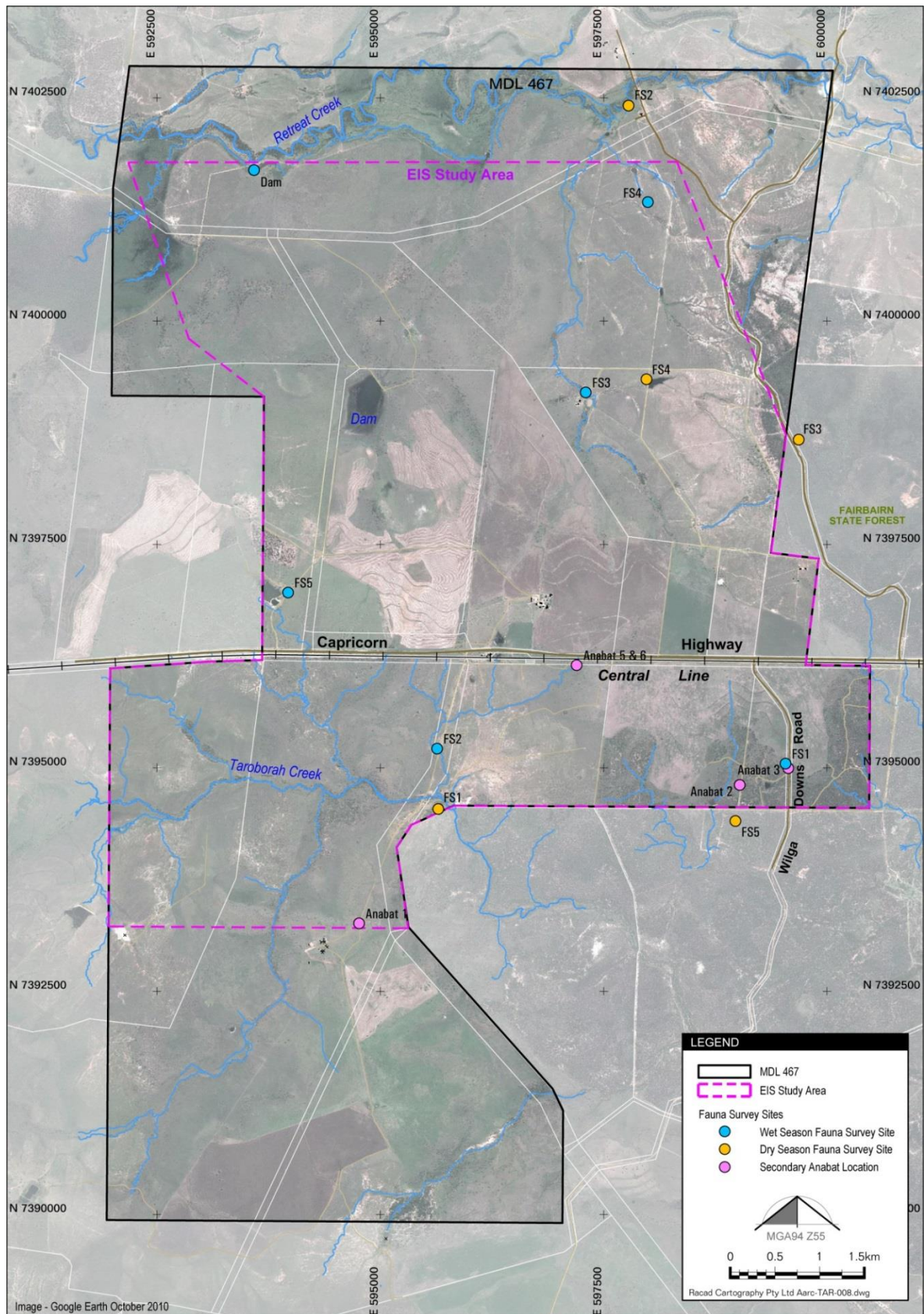


Figure 6 Fauna Transect locations within the Project Site

6.0 FLORA RESULTS AND DISCUSSION

A total of 205 flora species were identified within and immediately adjacent to the Project site. Appendix E contains a detailed list of the identified flora species found during the survey.

6.1 SPECIES OF CONSERVATION SIGNIFICANCE

No flora species of conservation significance as listed by the NC Act or EPBC Act were recorded from the Project site.

6.2 INTRODUCED / WEED SPECIES

Thirty-three introduced plant species were recorded from the Project site during the wet season and dry season flora surveys, as listed in Table 5. The Department of Agriculture Fisheries and Forestry (DAFF) website was searched for the status of each introduced species against the declared species list and Weed of National Significance (WONS) list.

Under the LP Act, pest species can be listed as Class 1, 2, or 3 declared plants. Class 1 pest species are those that are not commonly present in Queensland and, if introduced, would cause an adverse economic, environmental, or social impact. Land owners must take reasonable steps to keep land free of Class 1 pests. Class 2 pest species are established in Queensland and have, or could have, an adverse economic, environmental, or social impact. Land owners must take reasonable steps to keep land free of Class 2 pests, and often a coordinated approach by land owners, local government, and the community is required. Class 3 pest species are those that are established in Queensland and have, or could have, an adverse economic, environmental, or social impact. The primary objective of the Class 3 listing is to prevent the sale of the species, and therefore prevent their spread into new areas. Landholders are not required to keep land free of Class 3 pests, unless their land is adjacent to an environmentally significant area.

Three Class 2 declared weed species – Parthenium, Fireweed and Parkinsonia – were recorded on the Project site during the terrestrial flora surveys. A Class 3 declared weed species known as lantana was also recorded from the Project site. All four declared weed species are also listed as WONS.



Table 5 Introduced Flora Species Recorded on the Project Site

Family	Species Name	Common Name	WONS	Status under the LP Act
Apiaceae	<i>Cyclospermum leptophyllum</i>	Slender Celery	Not Listed	Not Listed
Apocynaceae	<i>Asclepias curassavica</i>	Red-head Cottonbush	Not Listed	Not Listed
Asteraceae	<i>Bidens pilosa</i>	Cobbler's Pegs	Not Listed	Not Listed
Asteraceae	<i>Conyza bonariensis</i>	Flaxleaf Fleabane	Not Listed	Not Listed
Asteraceae	<i>Parthenium hysterophorus</i>	Parthenium Weed	WONS	Class 2
Asteraceae	<i>Senecio madagascariensis</i>	Fireweed	WONS	Class 2
Asteraceae	<i>Silybum marianum</i>	Variegated Thistle	Not Listed	Not Listed
Asteraceae	<i>Verbesina encelioides</i>	Crown Beard	Not Listed	Not Listed
Asteraceae	<i>Xanthium pungens</i>	Noogoora Burr	Not Listed	Not Listed
Caesalpiniaceae	<i>Parkinsonia aculeata</i>	Parkinsonia	WONS	Class 2
Chenopodiaceae	<i>Salsola kali</i>	Roly-poly	Not Listed	Not Listed
Cyperaceae	<i>Cyperus rotundus</i>	Nutgrass	Not Listed	Not Listed
Euphorbiaceae	<i>Ricinus communis</i>	Castor Oil Plant	Not Listed	Not Listed
Fabaceae	<i>Stylosanthes viscosa</i>	Sticky Stylo	Not Listed	Not Listed
Malvaceae	<i>Malvastrum americanum</i> var. <i>americanum</i>	Spiked Malvastrum	Not Listed	Not Listed
Malvaceae	<i>Modiola caroliniana</i>	Red-flowered Mallow	Not Listed	Not Listed
Malvaceae	<i>Sida cordifolia</i>	Flannel Weed	Not Listed	Not Listed
Malvaceae	<i>Sida rhombifolia</i>	Paddy's Lucerne	Not Listed	Not Listed
Malvaceae	<i>Sida spinosa</i>	-	Not Listed	Not Listed
Mimosaceae	<i>Acacia farnesiana</i>	Mimosa	Not Listed	Not Listed
Poaceae	<i>Cenchrus ciliaris</i>	Buffel Grass	Not Listed	Not Listed
Poaceae	<i>Chloris gayana</i>	Rhodes Grass	Not Listed	Not Listed
Poaceae	<i>Chloris inflata</i>	Purpletop Rhodes Grass	Not Listed	Not Listed
Poaceae	<i>Chloris virgata</i>	Feathertop Rhodes Grass	Not Listed	Not Listed
Poaceae	<i>Dichanthium aristatum</i>	Angleton Grass	Not Listed	Not Listed
Poaceae	<i>Echinochloa colona</i>	Awnless Barnyard Grass	Not Listed	Not Listed
Poaceae	<i>Melinis repens</i>	Red Natal Grass	Not Listed	Not Listed

Family	Species Name	Common Name	WONS	Status under the LP Act
Poaceae	<i>Moorochloa eruciformis</i>	Sweet Signal Grass	Not Listed	Not Listed
Poaceae	<i>Paspalum distichum</i>	Water Couch	Not Listed	Not Listed
Poaceae	<i>Sorghum X alnum</i>	Sorghum	Not Listed	Not Listed
Poaceae	<i>Sorghum halepense</i>	Johnson Grass	Not Listed	Not Listed
Poaceae	<i>Urochloa mosambicensis</i>	Sabi Grass	Not Listed	Not Listed
Verbenaceae	<i>Lantana camara</i>	Lantana	WONS	Class 3

Source: AARC2012

6.3 VEGETATION COMMUNITIES

Figure 7 shows the distribution of the identified vegetation communities within the Project site.

Thirteen vegetation communities were identified on the Project site during the field surveys. Seven of these communities were classed as remnant vegetation as defined in the VM Act. In addition, one community (Community 9) was considered to be consistent with RE 11.4.9 in terms of species composition, but did not satisfy all requirements that define remnant vegetation (i.e. >70% of the height and/or >50% of the cover relative to the undisturbed height and cover of a given RE). Associations within the communities reflect different vegetation structures and compositions, which occur on different geophysical locations. The corresponding Queensland Herbarium RE classifications are noted for each of the described remnant vegetation communities.

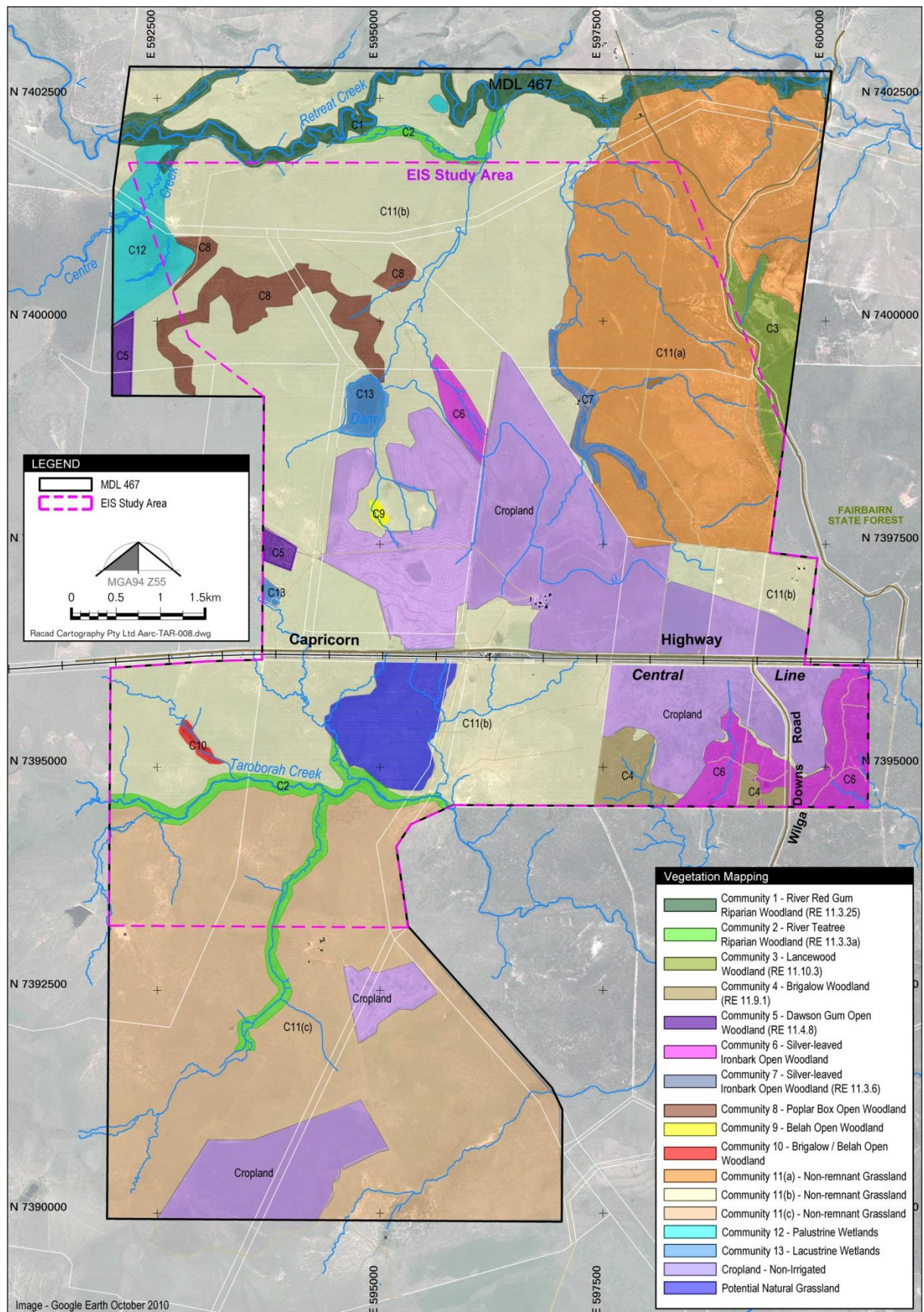


Figure 7 Vegetation Communities on the Project Site

6.3.1 Community 1 – River Red Gum Riparian Woodland (RE 11.3.25)

6.3.1.1 Location

The River Red Gum (*Eucalyptus camaldulensis* subsp. *acuta*) Riparian Woodland (Photo Plate 1) occurs along Retreat Creek in the north of the Project site.

6.3.1.2 Community Description

Woody Species

The canopy of this community is dominated by River Red Gum. Associated species forming a canopy layer to approximately 15 m tall include Dawson Gum (*E. cambageana*), Forest Red Gum (*E. tereticornis*), Belah (*Casuarina cristata*) and River She-oak (*C. cunninghamiana*). The shrub layer is dominated by Doolan (*Acacia salicina*) and Sandpaper Fig (*Ficus opposita*), with many associated species, including Red Bauhinia (*Lysiphyllum cunninghamii*), Erythroxylum (*Erythroxylum australe*), Weeping Bottlebrush (*Melaleuca viminalis*), River Teatree (*M. bracteata*) and *Eremophila* species. Currant Bush (*Carissa ovata*) is also commonly encountered in this community. The weed Parkinsonia (*Parkinsonia aculeata*), which is a declared Class 2 weed under the LP Act, is common within this community. Dominant flora is summarised in Table 6. Stem counts within a secondary transect gave 13 shrub stems and 21 tree stems.

Groundcover

Introduced species Buffel Grass (*Cenchrus ciliaris*) and Umbrella Canegrass (*Leptochloa digitata*) and native species Hairy Panic (*Panicum effusum*) and Musk Basil (*Basilicum polystachyon*) are co-dominant groundcover species. Buffel Grass is less dominant within this RE than other areas of the Project site. Other commonly encountered groundcover species include *Senecio brigalowensis*, Long-leaved Matrush (*Lomandra longifolia*), River Bitter-cress (*Rorippa eustylis*) and the introduced Variegated Thistle (*Silybum marianum*). The declared Class 2 weed, Parthenium (*Parthenium hysterophorus*) is also present in this RE. Dominant flora is summarised in Table 6. A secondary transect consisted of 36% grass and sedge cover, 42% herb cover, 8% leaf litter and 14% bare ground.



Photo Plate 1 Community 1 – River Red Gum Riparian Woodland (RE 11.3.25)

Table 6 Dominant flora of Community 1 – River Red Gum Riparian Woodland (RE 11.3.25)

Layer	Relative Dominance	Scientific Name	Common Name
Canopy	Dominant	<i>Eucalyptus camaldulensis</i> subsp. <i>acuta</i>	River Red Gum
	Associated	<i>Eucalyptus cambageana</i>	Dawson Gum
	Occasional	<i>Casuarina cristata</i>	Belah
	Occasional	<i>Casuarina cunninghamiana</i>	River She-oak
	Occasional	<i>Eucalyptus tereticornis</i>	Forest Red Gum
Shrub	Co-Dominant	<i>Acacia salicina</i>	Doolan
	Co-Dominant	<i>Ficus opposita</i>	Sandpaper Fig
	Associated	<i>Acacia farnesiana</i> *	Mimosa Bush
	Associated	<i>Eremophila</i> sp.	
	Associated	<i>Lysiphyllum cunninghamii</i>	Red Bauhinia
	Associated	<i>Melaleuca bracteata</i>	River Teatree
	Associated	<i>Parkinsonia aculeata</i> *	Parkinsonia
	Occasional	<i>Erythroxylum australe</i>	Erythroxylum
	Occasional	<i>Melaleuca viminalis</i>	Weeping Bottlebrush
Ground	Co-Dominant	<i>Cenchrus ciliaris</i> *	Buffel Grass
	Co-Dominant	<i>Leptochloa digitata</i>	Umbrella Canegrass
	Co-Dominant	<i>Panicum effusum</i>	Hairy Panic
	Co-Dominant	<i>Senecio brisbanensis</i>	
	Associated	<i>Basilicum polystachyon</i>	Musk Basil
	Associated	<i>Lomandra longifolia</i>	Long-leaved Matrush
	Associated	<i>Silybum marianum</i> *	Variegated Thistle
	Occasional	<i>Carissa ovata</i>	Currant Bush
	Occasional	<i>Rorippa eustylis</i>	River Bitter-cress
	Occasional	<i>Senecio madagascariensis</i> *	Fireweed

* introduced species

Source: AARC2012



6.3.1.3 Conservation Status

This community is consistent with RE 11.3.25, which is described by the Regional Ecosystem Description Database (REDD) (Queensland Herbarium 2011) as “*Eucalyptus tereticornis* or *E. camaldulensis* woodland fringing drainage lines”. RE 11.3.25 is listed as “Least Concern” under the VM Act, although it has a DEHP Biodiversity Status of “Of Concern”. This community is not listed under the federal EPBC Act. No flora species of conservation significance were recorded within the River Red Gum Riparian Woodland.

6.3.2 Community 2 – River Teatree Riparian Woodland (RE 11.3.3a)

6.3.2.1 Location

The River Teatree (*Melaleuca bracteata*) Riparian Woodland (Photo Plate 2) occurs in the south of the Project site in association with Taraborah Creek.

6.3.2.2 Community Description

Woody Species

This community is characterised by a canopy, dominated by River Teatree, fringing the ephemeral watercourse. Coolabah (*Eucalyptus coolabah*) is the dominant emergent species, while Dallachy's Gum (*Corymbia dallachiana*) occurs sporadically. The open shrub layer is co-dominated by River She-oak and Red Bauhinia. Infrequent midstorey species include Wilga (*Geijera parviflora*), Holly Bush (*Alectryon diversifolius*), and Whitewood (*Atalaya hemiglauca*). Introduced Mimosa Bush occurs commonly throughout the shrub layer. Dominant flora is summarised in Table 7. Stem counts within a *Secondary* Transect recorded 2 shrub stems and 7 tree stems.

Groundcover

The ground layer consists of a dense cover of grasses that is dominated by Buffel Grass. Other groundcover species present include Kangaroo Grass (*Themeda triandra*), Spicytop (*Capillipedium spicigerum*), Spiked Sida (*Sida hackettiana*), Flannel Weed (*Sida cordifolia*) and Fireweed (*Senecio madagascariensis*). Fireweed is a declared Class 2 pest plant as listed under the LP Act and WONS. A *Secondary* Transect within this community consisted of 74% grass and sedge cover, 16% herb cover, 2% leaf litter and 8% bare ground.



Photo Plate 2 Community 2 – River Teatree (*Melaleuca bracteata*) Riparian Woodland

Table 7 Dominant flora of Community 2 – River Teatree Riparian Woodland (RE 11.3.3a)

Layer	Relative Dominance	Scientific Name	Common Name
Canopy	Dominant	<i>Melaleuca bracteata</i>	River Teatree
	Associated	<i>Casuarina cristata</i>	Belah
	Associated	<i>Eucalyptus coolabah</i>	Coolabah
	Occasional	<i>Corymbia dallachiana</i>	Dallachy's Gum
	Occasional	<i>Eucalyptus populnea</i>	Poplar Box
	Occasional	<i>Eucalyptus melanophloia</i>	Silver-leaved Ironbark
Shrub	Co-dominant	<i>Casuarina cunninghamiana</i>	River She-oak
	Co-dominant	<i>Lysiphyllum cunninghamii</i>	Bauhinia
	Associated	<i>Acacia farnesiana</i> *	Mimosa Bush

Layer	Relative Dominance	Scientific Name	Common Name
	Occasional	<i>Acacia harpophylla</i>	Brigalow
	Occasional	<i>Atalaya hemiglauca</i>	Whitewood
	Occasional	<i>Alectryon diversifolius</i>	Holly Bush
	Occasional	<i>Geijera parviflora</i>	Wilga
Ground	Dominant	<i>Cenchrus ciliaris</i> *	Buffel Grass
	Occasional	<i>Senecia madagascariensis</i> *	Fireweed
	Occasional	<i>Themeda triandra</i>	Kangaroo Grass
	Occasional	<i>Sida hackettiana</i>	Spiked Sida
	Occasional	<i>Sida cordifolia</i> *	Flannel Weed

* introduced species

Source: AARC2012

6.3.2.3 Conservation Status

This community is considered to be consistent with RE 11.3.3a. RE 11.3.3 is described by the REDD (Queensland Herbarium 2011) as “*Eucalyptus coolabah* woodland on alluvial plains” and the subcategory RE 11.3.3a is described as “Riverine wetland or fringing riverine wetland – *Melaleuca bracteata* woodland on alluvial plains”.

RE 11.3.3 is listed by the DEHP Biodiversity Status and Vegetation Management Act as “Of Concern”. This community is not listed under the EPBC Act. No flora species of conservation significance were recorded within the River Teatree Riparian Woodland.

6.3.3 Community 3 – Lancewood Woodland (RE 11.10.3)

6.3.3.1 Location

The Lancewood (*Acacia shirleyi*) Woodland (Photo Plate 3) community occurs in association with Fairbairn State Forest to the east of the Project site, and occupies an area of land on the eastern site boundary.

6.3.3.2 Community Description

Woody Species

Lancewood is extremely dominant within this community. In some areas this species forms a dense canopy at approximately 12 m, with very few other species in the canopy layer but occasional emergent gum trees to approximately 20 m, especially Lemon-scented Gum (*Corymbia citriodora* subsp. *citriodora*) and, particularly in the southern patch, Dawson Gum (*Eucalyptus cambageana*).

In one area, within the northern patch, it is apparent that a canopy of approximately 12 m is dominated by Lancewood, with very few other canopy species. However, all of these canopy trees were dead as



a result of a previous fire. The dead and scorched Lancewood trees are still standing and a dense shrub layer has regenerated but there is no real canopy. The shrub layer is dominated by juvenile Lancewood and the occasional Red Ash (*Alphitonia excelsa*) to a height of approximately 2 m. Dominant flora is summarised in Table 8. A count of woody stems within a Secondary Transect recorded 164 shrubs.

Groundcover

Buffel Grass occurs as the dominant species, where the canopy of Lancewood is open enough to allow groundcover growth. Various herbs also occur, including *Hibiscus sturtii* var. *grandiflorus*, *Sida atherophora* and introduced Flannel Weed.



Photo Plate 3 Community 3 – Lancewood (*Acacia shirleyi*) Woodland (RE 11.10.3)

Table 8 Dominant flora of Community 3 – Lancewood Woodland (RE 11.10.3)

Layer	Relative Dominance	Scientific Name	Common Name
Emergent (to 20 m)	Dominant	<i>Corymbia citriodora</i> subsp. <i>citriodora</i>	Lemon-scented Gum
	Associated	<i>Eucalyptus cambageana</i>	Dawson Gum
Canopy (to 12 m)	Dominant	<i>Acacia shirleyi</i>	Lancewood
Shrub (to 2 m)	Dominant	<i>Acacia shirleyi</i> (juvenile)	Lancewood (juvenile)
	Associated	<i>Alphitonia excelsa</i>	Red Ash
Ground (0 – 2 m)	Dominant	<i>Cenchrus ciliaris</i> *	Buffel Grass
	Occasional	<i>Hibiscus sturtii</i> var. <i>grandiflorus</i>	
	Occasional	<i>Sida atherophora</i>	
	Occasional	<i>Sida cordifolia</i> *	Flannel Weed

* introduced species

Source: AARC 2012

6.3.3.3 Conservation Status

This community is consistent with RE 11.10.3, which is described by the REDD (Queensland Herbarium 2011) as “*Acacia catenulata* or *A. shirleyi* open forest on coarse-grained sedimentary rocks. Crests and scarps.”

RE 11.10.3 is listed by the Vegetation Management Act and DEHP Biodiversity Status as “Least Concern” and “No Concern”, respectively. This community is not listed under the EPBC Act. No flora species of conservation significance were recorded within the Lancewood Woodland.

6.3.4 Community 4 – Brigalow Woodland (RE 11.9.1)

6.3.4.1 Location

Brigalow (*Acacia harpophylla*) Woodland (Photo Plate 4) occurs in the south-east of the Project site, adjacent to Fairbairn State Forest. The patch of remnant vegetation occurring in the southeast corner of the Project site, adjacent to Fairbairn State Forest, is comprised of two contiguous but distinct vegetation communities: Community 4 – Brigalow Woodland (RE 11.9.1) and Community 6 – Silver-leaved Ironbark Open Woodland. These two communities occur in distinct stands but are interspersed within the patch and as such definite boundaries between the two communities are extremely difficult to determine from aerial images. As a result, quaternary survey sites were concentrated in this area in order to accurately determine the boundaries between the two communities. In general Lancewood Woodland occupies more surface area than Brigalow Woodland and is particularly dominant to the east of Wilga Downs Road.



6.3.4.2 Community Description

Woody Species

This community is described as Brigalow open forest to 15 m with associated emergents to a height of 20 m. Brigalow forms a low canopy layer, while the emergent canopy is typically dominated by Dawson Gum and associated with Silver-leaved Ironbark (*Eucalyptus melanophloia*). However, Silver-leaved Ironbark replaces Dawson Gum as the dominant emergent species in some areas.

False Sandalwood (*Eremophila mitchellii*) and Wilga exhibit a co-dominant distribution throughout the mid-storey of this community. Other commonly occurring mid-storey species include Erythroxylum, Currant Bush and Yellow Wood (*Terminalia oblongata* subsp. *oblongata*). Red Ash, Whitewood, Holly Bush and Sticky Hop-bush (*Dodonaea viscosa* subsp. *spatulata*) occur occasionally throughout the community. A list of the prominent flora species present is provided in Table 9.

Groundcover

The ground layer is dominated by exotic Buffel Grass. Associated grasses include Red Natal Grass (*Melinis repens*), Queensland Bluegrass (*Dichanthium sericeum* subsp. *sericeum*), and Black Speargrass (*Heteropogon contortus*). Occasional grasses and herbs present include Slender Chloris (*Chloris divaricata* var. *divaricata*), Feathertop Wiregrass (*Aristida latifolia*), Purple Lovegrass (*Eragrostis lacunaria*), Woodland Lovegrass (*Eragrostis sororia*), Prickly Chaff Flower (*Achyranthes aspera*), and Flannel Weed.



Photo Plate 4 Community 4 – Brigalow (*Acacia harpophylla*) Woodland (RE 11.9.1)



Table 9 Dominant Flora of Community 4 – Brigalow (*Acacia harpophylla*) Woodland (RE 11.9.1)

Layer	Relative Dominance	Scientific Name	Common Name
Emergent (to 20 m)	Dominant	<i>Eucalyptus cambageana</i>	Dawson Gum
	Associated	<i>Eucalyptus melanophloia</i>	Silver-leaved Ironbark
	Occasional	<i>Eucalyptus crebra</i>	Narrow-leaved Ironbark
	Occasional	<i>Eucalyptus populnea</i>	Poplar Box
Canopy (to 15 m)	Dominant	<i>Acacia harpophylla</i>	Brigalow
Shrub (2 – 5 m)	Dominant	<i>Eremophila mitchellii</i>	False Sandalwood
	Dominant	<i>Geijera parviflora</i>	Wilga
	Associated	<i>Erythroxylum australe</i>	Erythroxylum
	Associated	<i>Carissa ovata</i>	Currant Bush
	Associated	<i>Terminalia oblongata</i> subsp. <i>oblongata</i>	Yellow wood
	Occasional	<i>Atelaya hemiglauca</i>	Cattle Bush
	Occasional	<i>Alectryon diversifolius</i>	Holly Bush
	Occasional	<i>Dodonaea viscosa</i> subsp. <i>spathulata</i>	Sticky Hop-bush
Ground (to 1 m)	Dominant	<i>Cenchrus ciliaris</i> *	Buffel Grass
	Associated	<i>Dichanthium sericeum</i> subsp. <i>sericeum</i>	Queensland Bluegrass
	Associated	<i>Melinis repens</i> *	Red Natal Grass
	Associated	<i>Heteropogon contortus</i>	Black Speargrass
	Occasional	<i>Chloris divaricata</i> var. <i>divaricata</i>	Slender Chloris
	Occasional	<i>Achyranthes aspera</i>	Prickly Chaff Flower
	Occasional	<i>Aristida latifolia</i>	Feathertop Wiregrass
	Occasional	<i>Eragrostis lacunaria</i>	Purple Lovegrass
	Occasional	<i>Eragrostis sororia</i>	Woodland Lovegrass
	Occasional	<i>Sida cordifolia</i> *	Flannel Weed

* introduced species

Source: AARC2012

6.3.4.3 Conservation Status

This community is consistent with RE 11.9.1 in terms of species composition and height. RE 11.9.1 is described by the REDD (Queensland Herbarium 2011) as “*Acacia harpophylla*-*Eucalyptus*



cambageana open forest to woodland on fine-grained sedimentary rocks". RE 11.9.1 is listed as "Endangered" under the VM Act and the DEHP Biodiversity Status.

This community is listed under the EPBC Act, described as "Brigalow (*Acacia harpophylla* dominant and co-dominant)".

No flora species of conservation significance were recorded within the Brigalow Woodland.

6.3.5 Community 5 – Dawson Gum Open Woodland (RE 11.4.8)

6.3.5.1 Location

Dawson gum (*Eucalyptus cambageana*) Open Woodland (Photo Plate 5) occurs in two small, separate patches in the west of the Project site.

6.3.5.2 Community Description

Woody Species

This community consists of open woodland dominated by Dawson Gum (*Eucalyptus cambageana*) with an associated to occasional presence of Brigalow. The low shrub layer is dominated by Currant Bush.

Groundcover

The ground layer is dominated by Buffel Grass, while Spiked Sida (*Sida hackettiana*) occurs commonly. Although this community is dominated by exotic Buffel Grass, it also contains a high diversity of native grasses and sedges. Occasional native groundcover species include *Bothriochloa decipiens* var. *decipiens*, Kangaroo Grass, Barbed Wire Grass (*Cymbopogon refractus*), Sticky Sedge (*Cyperus fulvus*) and Common Fringe-sedge (*Fimbristylis dichotoma*). Introduced and occasional groundcover species present include Sabi Grass (*Urochloa mosambicensis*), Purpletop Chloris (*Chloris inflata*) and Red Natal Grass.

A summary of the flora species composition of Community 5 is provided in Table 10 below.



Photo Plate 5 Community 5 – Dawson Gum (*Eucalyptus cambageana*) Open Woodland (RE 11.4.8)

Table 10 Dominant Flora of Community 5 – Dawson Gum (*Eucalyptus cambageana*) Open Woodland (RE 11.4.8)

Layer	Relative Dominance	Scientific Name	Common Name
Canopy (10 – 17 m)	Dominant	<i>Eucalyptus cambageana</i>	Dawson Gum
Shrub (3 – 6 m)	Associated	<i>Acacia harpophylla</i>	Brigalow
	Dominant	<i>Carissa ovata</i>	Currant Bush
Ground (1 – 2 m)	Dominant	<i>Cenchrus ciliaris</i> *	Buffel Grass
	Associated	<i>Sida hackettiana</i>	Spiked Sida
	Occasional	<i>Aristida benthamii</i> var. <i>spinulifera</i>	

Layer	Relative Dominance	Scientific Name	Common Name
	Occasional	<i>Bothriochloa decipiens</i> var. <i>decipiens</i>	
	Occasional	<i>Chloris divaricata</i> var. <i>divaricata</i>	Slender Chloris
	Occasional	<i>Chloris inflata</i> *	Purpletop Chloris
	Occasional	<i>Conyza bonariensis</i> *	Flaxleaf Fleabane
	Occasional	<i>Cymbopogon refractus</i>	Barbed Wire Grass
	Occasional	<i>Cyperus fulvus</i>	Sticky Sedge
	Occasional	<i>Enneapogon lindleyanus</i>	Conetop Nineawn
	Occasional	<i>Eragrostis elongata</i>	Clustered Lovegrass
	Occasional	<i>Eragrostis lacunaria</i>	Purple Lovegrass
	Occasional	<i>Evolvulus alsinoides</i>	
	Occasional	<i>Fimbristylis dichotoma</i>	Common Fringe-sedge
	Occasional	<i>Leptochloa decipiens</i> subsp. <i>decipiens</i>	
	Occasional	<i>Melinis repens</i> *	Red Natal Grass
	Occasional	<i>Themeda triandra</i>	Kangaroo Grass
	Occasional	<i>Urochloa mosambicensis</i> *	Sabi Grass

* introduced species

Source: AARC2012

6.3.5.3 Conservation Status

In terms of species composition, this community is consistent with RE 11.4.8, which is described by the REDD (Queensland Herbarium 2011) as “*Eucalyptus cambageana* woodland to open forest with *Acacia harpophylla* or *A. argyrodendron* on Cainozoic clay plains”. RE 11.4.8 is listed as “Endangered” under the VM Act and the DEHP Biodiversity Status.

RE 11.4.8 is listed under the EPBC Act, described as “Brigalow (*Acacia harpophylla* dominant and co-dominant)”.

No flora species of conservation significance were recorded within this community.



6.3.6 Community 6 – Silver-leaved Ironbark Open Woodland

6.3.6.1 Location

Silver-leaved Ironbark (*Eucalyptus melanophloia*) Open Woodland (Photo Plate 6) occurs in several fragmented patches in the central and south-eastern portions of the Project site.

6.3.6.2 Community Description

Woody Species

This community is dominated by Silver-leaved Ironbark with an associated presence of Dawson Gum, and occasional specimens of Lemon-scented Gum and Poplar Box. The midstorey is dominated by Wilga and False Sandalwood with associated species such as Queensland Ebony (*Lysiphyllum hookeri*), Dogwood (*Eremophila longifolia*), Currant Bush and Yellow Wood. Woody stem counts completed within this community recorded 14 shrub stems and 4 tree stems within a representative Secondary Transect.

Groundcover

The ground layer of Community 6 is dominated by Desert Bluegrass (*Bothriochloa ewartiana*) and Spicytop. Associated grasses include Kangaroo Grass, Black Speargrass, Awnless Barnyard Grass (*Echinochloa colona*) and Buffel Grass. A *Secondary* Transect within this community consisted of 56% grass cover, 3% herb cover, 10% bare ground and 10% cover of regenerating shrub species.

The dominant flora species of Community 6 are listed in Table 11 below.





Photo Plate 6 Silver-leaved Ironbark (*Eucalyptus melanophloia*) Open Woodland

Table 11 Dominant Flora of Community 6 – Silver-leaved Ironbark (*Eucalyptus melanophloia*) Open Woodland

Layer	Relative Dominance	Scientific Name	Common Name
Canopy (10 – 15 m)	Dominant	<i>Eucalyptus melanophloia</i>	Silver-leaved Ironbark
	Associated	<i>Eucalyptus cambageana</i>	Dawson Gum
	Occasional	<i>Corymbia citriodora</i> subsp. <i>citriodora</i>	Lemon-scented Gum
	Occasional	<i>Eucalyptus populnea</i>	Poplar Box
Shrub (2 – 8 m)	Co-dominant	<i>Geijera parviflora</i>	Wilga
	Co-dominant	<i>Eremophila mitchellii</i>	False Sandalwood
	Associated	<i>Lysiphyllum hookeri</i>	Queensland Ebony

Layer	Relative Dominance	Scientific Name	Common Name
	Associated	<i>Eremophila longifolia</i>	Dogwood
	Associated	<i>Terminalia oblongata</i> subsp. <i>oblongata</i>	Yellow Wood
	Associated	<i>Carissa ovata</i>	Currant Bush
Ground (0 – 1 m)	Co-dominant	<i>Bothriochloa ewartiana</i>	Desert Bluegrass
	Co-dominant	<i>Capillipedium spicigerum</i>	Spicytop
	Associated	<i>Themeda triandra</i>	Kangaroo Grass
	Associated	<i>Heteropogon contortus</i>	Black Speargrass
	Associated	<i>Echinochloa colona</i> *	Awnless Barnyard Grass
	Associated	<i>Cenchrus ciliaris</i> *	Buffel Grass
	Occasional	<i>Melinis repens</i> *	Red Natal Grass

* introduced species

Source: AARC2012

6.3.6.3 Conservation Status

This community is not considered to be consistent with any regional ecosystems as described by the REDD (Queensland Herbarium 2011). This community is not listed under the federal EPBC Act. No flora species of conservation significance were recorded within the Silver-leaved Ironbark Open Woodland.

6.3.7 Community 7 – Silver-leaved Ironbark Open Woodland (RE 11.3.6)

6.3.7.1 Location

This Silver-leaved Ironbark Open Woodland community (Photo Plate 7) occurs in the north-east portion of the Project site in association with one of the more prominent tributaries to Retreat Creek.

6.3.7.2 Community Description

Woody Species

This community is best described as open woodland dominated by Silver-leaved Ironbark with associated species including Dallachy's Gum and Forest Red Gum (*E. tereticornis*) to a height of 17 m. This community contains a T2 layer to 10 m that is dominated by River Teatree. The T2 layer consists of a sub-dominant abundance of White Cypress Pine (*Callitris glaucophylla*) and occasional specimens of Queensland Ebony. The shrub layer is co-dominated by Soap Bush (*Acacia holosericea*) and Currant Bush and complimented by occasional specimens of Red Ash, *Erythroxylum* and *Senna sophora* var. (*40Mile Scrub J.R.Clarkson+ 6908*). Woody stem counts completed within this community recorded 14 shrub stems and 4 tree stems within a representative secondary transect.



Groundcover

The ground layer is co-dominated by Red Natal Grass and *Panicum decompositum* var. *tenuous*. Associated grasses include Black Speargrass and two exotic species, Awnless Barnyard Grass and Buffel Grass. Other occasional groundcover species include Many-flowered Mat-rush (*Lomandra multiflora*), Wild Jute (*Corchorus trilocularis*) and *Aristida lazaridis*. A secondary transect within this community consisted of 82% grass cover, 4% leaf litter and 16% cover of regenerating shrub species.

Table 12 below provides a list of the prominent flora species that comprise community 7.



Photo Plate 7 Community 7 – Silver-leaved Ironbark (*E. melanophloia*) Open Woodland

Table 12 Dominant Species of Community 7 – Silver-leaved Ironbark (*E. melanophloia*) Open Woodland

Layer	Relative Dominance	Scientific Name	Common Name
Canopy – T1 (11 – 17 m)	Dominant	<i>Eucalyptus melanophloia</i>	Silver-leaved Ironbark
	Associated	<i>Corymbia dallachiana</i>	Dallachy's Gum
	Associated	<i>Eucalyptus tereticornis</i>	Forest Red Gum
Canopy – T2 (8 – 10 m)	Dominant	<i>Melaleuca bracteata</i>	River Teatree
	Associated	<i>Callitris glaucophylla</i>	White Cypress Pine
	Occasional	<i>Lysiphyllum hookeri</i>	Queensland Ebony
Shrub (1.5 – 6 m)	Dominant	<i>Acacia holosericea</i>	Soap Bush
	Dominant	<i>Carissa ovata</i>	Currant Bush
	Occasional	<i>Senna sophora</i> var. (40Mile Scrub J.R. Clarkson+ 6908)	
	Occasional	<i>Erythroxylum australe</i>	Erythroxylum
	Occasional	<i>Alphitonia excelsa</i>	Red Ash
Ground (0 – 1 m)	Co-dominant	<i>Melinis repens</i> *	Red Natal Grass
	Co-dominant	<i>Panicum decompositum</i> var. <i>tenuius</i>	
	Associated	<i>Echinochloa colona</i> *	Awnless Barnyard Grass
	Associated	<i>Heteropogon contortus</i>	Black Speargrass
	Associated	<i>Cenchrus ciliaris</i> *	Buffel Grass
	Occasional	<i>Lomandra multiflora</i>	Many-flowered Mat-rush
	Occasional	<i>Corchorus trilocularis</i>	Wild Jute
	Occasional	<i>Aristida lazardis</i>	

* introduced species

Source: AARC2012

6.3.7.3 Conservation Status

In terms of species composition, this community is considered to be consistent with RE 11.3.6 – “*Eucalyptus melanophloia* woodland on alluvial plains”, as described by the REDD (Queensland Herbarium 2011). RE 11.3.6 is listed as “Least Concern” under the VM Act and “Of Concern” by the DEHP Biodiversity Status.



This community is not listed under the federal EPBC Act. No species of conservation significance were recorded from this community.

6.3.8 Community 8 – Poplar Box Open Woodland

6.3.8.1 Location

The Poplar Box (*Eucalyptus populnea*) Open Woodland community (Photo Plate 8) occurs in the north-west of the Project site and is largely surrounded by open grasslands.

6.3.8.2 Community Description

Woody Species

This community is dominated by Poplar Box, with associated canopy species such as Lancewood and Brigalow. The shrub layer is sparse and contains Mimosa Bush and *Denhamia oleaster*.

Groundcover

Groundcover species present include Buffel Grass, *Chloris* sp., Cobbler's Pegs (*Bidens pilosa*) and Common Joyweed (*Alternanthera nodiflora*).

The dominant flora species recorded in the Poplar Box Open Woodland are listed below in Table 13.



Photo Plate 8 Community 8 – Poplar Box (*Eucalyptus populnea*) Open Woodland

Table 13 Dominant Flora of Community 8 – Poplar Box (*Eucalyptus populnea*) Open Woodland

Layer	Relative Dominance	Scientific Name	Common Name
Canopy (to 20 m)	Dominant	<i>Eucalyptus populnea</i>	Poplar Box
	Associated	<i>Acacia shirleyi</i>	Lancewood
	Associated	<i>Acacia harpophylla</i>	Brigalow
Shrub (1 – 5 m)	Occasional	<i>Denhamia oleaster</i>	
	Occasional	<i>Acacia farnesiana</i> *	Mimosa Bush
Ground (0 – 1.5 m)	Dominant	<i>Cenchrus ciliaris</i> *	Buffel Grass
	Occasional	<i>Bidens pilosa</i>	Cobbler's Pegs
	Occasional	<i>Chloris</i> sp.	
	Occasional	<i>Alternanthera nodiflora</i>	Common Joyweed

* introduced species

Source: AARC2012

6.3.8.3 Conservation Status

This community is not considered to be consistent with any regional ecosystems as described by the REDD (Queensland Herbarium 2011). This community is not listed under the federal EPBC Act. No flora species of conservation significance were recorded within the Poplar Box Open Woodland.

6.3.9 Community 9 – Belah Low Open Woodland

6.3.9.1 Location

The Belah Low Open Woodland community (Photo Plate 9) occurs as a small patch of regrowth located in the central-western portion of the Project site. This community is surrounded by low open grasslands that are dominated by introduced pasture grasses (e.g. Buffel Grass).

6.3.9.2 Community Description

Woody Species

This community consists of a low canopy layer dominated by Belah with the sub-dominant species being Red Bauhinia. The shrub layer consists of *Erythroxylum* and two introduced species, Mimosa Bush and Parkinsonia. Parkinsonia is a Class 2 declared pest plant under the LP Act and a Weed of National Significance.

Groundcover

The ground layer is dominated by exotic grass species including Buffel Grass and Red Natal Grass.



The dominant flora species recorded within Community 9 are listed in Table 14.



Photo Plate 9 Community 9 – Belah (*Casuarina cristata*) Low Open Woodland

Table 14 Dominant Flora of Community 9 – Belah (*C. cristata*) Low Open Woodland

Layer	Relative Dominance	Scientific Name	Common Name
Canopy	Dominant	<i>Casuarina cristata</i>	Belah
	Associated	<i>Lysiphyllum cunninghamii</i>	Red Bauhinia
Shrub	Associated	<i>Erythroxylum australe</i>	Erythroxylum
	Occasional	<i>Vachellia farnesiana</i> *	Mimosa Bush
	Occasional	<i>Parkinsonia aculeata</i> *	Parkinsonia
Ground	Co-dominant	<i>Melinis repens</i> *	Red Natal Grass
	Co-dominant	<i>Cenchrus ciliaris</i> *	Buffel Grass

* introduced species

6.3.9.3 Conservation Status

With regard to dominant species composition, this community is considered to be consistent with RE 11.4.9 – “*Acacia harpophylla* shrubby open forest to woodland with *Terminalia oblongata* on Cainozoic clay plains”, as described by the REDD (Queensland Herbarium 2011), in terms of species composition. As outlined in the RE description, *Casuarina cristata* sometimes replaces *Acacia harpophylla* in the overstorey and *Lysiphyllum cunninghamii* sometimes co-dominates. However, Community 9 did not satisfy all the requirements for remnant vegetation (i.e. >70% of the height and/or >50% of the cover relative to the undisturbed height and cover of a given RE). Consequently, although RE 11.4.9 is listed as “Endangered” under the VM Act and DEHP Biodiversity Status, the highly disturbed and regrowth state of this community suggests that this vegetation is non-remnant and is therefore not of conservation significance under Queensland legislation.

RE 11.4.9 is listed under the EPBC Act, described as “Brigalow (*Acacia harpophylla* dominant and co-dominant)” and includes regrowth vegetation. However, this vegetation community is not Brigalow dominant or co-dominant and is therefore not of conservation significance under the EPBC Act.

No flora species of conservation significance were recorded from this community.

6.3.10 Community 10 – Brigalow / Belah Low Open Woodland

6.3.10.1 Location

This Brigalow/Belah Low Open Woodland community (Photo Plate 10) is located in the south-west portion of the Project site and occurs in association with a drainage line to Taroborah Creek. This community also occurs in a highly disturbed state along drainage lines associated with Retreat Creek and Taroborah Creek.

6.3.10.2 Community Description

Woody Species

The canopy of this community ranges from 6 to 8 m in height and is co-dominated by Brigalow and Belah with the occasional occurrence of Coolabah. The sub-canopy exhibits a co-dominant composition of Red Bauhinia and Yellow Wood to a height of 6 m.

The shrub layer occurs to a height of 4 m and is dominated by Currant Bush. Associated species include False Sandalwood and Holly Bush, while occasional species include Erythroxylum and Wilga.

Groundcover

The ground layer occurs to a height of 1.5 m and is dominated by exotic Buffel Grass, while Awnless Barnyard Grass exhibits a sub-dominant presence. Occasional native species present within this community include Black Speargrass and *Senna sophora* var. (*40Mile Scrub J.R.Clarkson+ 6908*).

A list of the dominant flora species of Community 10 is provided in Table 15.





Photo Plate 10 Community 10 – Brigalow (*A. harpophylla*) / Belah (*C. cristata*) Low Open Woodland

Table 15 Dominant Flora of Community 10 – Brigalow (*A. harpophylla*) / Belah (*C. cristata*) Low Open Woodland

Layer	Relative Dominance	Scientific Name	Common Name
T1 (6 – 8 m)	Co-dominant	<i>Acacia harpophylla</i>	Brigalow
	Co-dominant	<i>Casuarina cristata</i>	Belah
	Occasional	<i>Eucalyptus coolabah</i>	Coolabah
T2 (4 – 6 m)	Co-dominant	<i>Lysiphyllum cunninghamii</i>	Bauhinia
	Co-dominant	<i>Terminalia oblongata</i> subsp. <i>oblongata</i>	Yellow Wood
Shrub (1.5 – 4 m)	Dominant	<i>Carissa ovata</i>	Currant Bush
	Associated	<i>Alectryon diversifolius</i>	Holly Bush
	Associated	<i>Eremophila mitchellii</i>	False Sandalwood

Layer	Relative Dominance	Scientific Name	Common Name
	Occasional	<i>Geijera parviflora</i>	Wilga
	Occasional	<i>Erythroxylum australe</i>	Erythroxylum
Ground (0 – 1.5 m)	Dominant	<i>Cenchrus ciliaris</i> *	Buffel Grass
	Associated	<i>Echinochloa colona</i> *	Awnless Barnyard Grass
	Occasional	<i>Senna sophora</i> var. (40Mile Scrub J.R.Clarkson+ 6908)	
	Occasional	<i>Heteropogon contortus</i>	Black Speargrass

* introduced species

6.3.10.3 Conservation Status

Community 10 is consistent with RE 11.4.9 – “*Acacia harpophylla* shrubby open forest to woodland with *Terminalia oblongata* on Cainozoic clay plains”, as described by the REDD (Queensland Herbarium 2011). RE 11.4.9 is listed as “Endangered” under the VM Act and DEHP Biodiversity Status.

This community is listed as an Endangered Ecological Community under the EPBC Act, described as “Brigalow (*Acacia harpophylla* dominant and co-dominant)”.

Despite targeted searches, no flora species of conservation significance were recorded from this community.

6.3.11 Community 11 – Non-remnant Grassland

6.3.11.1 Location

This Non-remnant Grassland community (Photo Plate 11) is dominated by exotic Buffel Grass and occupies large areas of land throughout the Project site.

6.3.11.2 Community Description

Woody Species

This community consists of low open grasslands dominated by Buffel with various native and exotic groundcover species. Woody species exhibit a scattered presence throughout this community.

Community 11a occurs in the north-east of the Project site and contains sparse emergent species such as Pink Bloodwood (*Corymbia intermedia*), Dawson Gum and Lancewood. Small scattered stands of regrowth vegetation co-dominated by Soap Bush and Red Ash also occur in this area of the Project site. A secondary transect in this area recorded a woody stem count of 6 shrub stems and no tree stems.

Within the southern portion of the site, north of Taraborah Creek, Community 11b consists of a very sparse and scattered distribution of Moreton Bay Ash (*Corymbia tessellaris*), Silver-leaved Ironbark, Brigalow and Queensland Ebony. Occasional midstorey species include Wait-a-while (*Capparis*



lasiantha), Currant Bush, False Sandalwood and Erythroxylum. A *Secondary* Transect in this area recorded a sparse canopy with only 10% cover over 4 m of a 50 m transect.

The area south of Taraborah Creek (Community 11c) contains scattered canopy species such as Silver-leaved Ironbark, Dawson Gum and Pink Bloodwood.

Groundcover

This non-remnant grassland community is dominated by exotic Buffel Grass and contains a high abundance of other exotic groundcover species such as Rhodes Grass (*Chloris gayana*), Purpletop Chloris, Red Natal Grass, Parthenium, Parkinsonia and Noogoora Burr (*Xanthium pungens*). Native groundcover species occurring in some areas include Curly Bluegrass (*Dichanthium fecundum*), Annual Bluegrass (*Dichanthium sericeum* subsp. *humilius*), Queensland Bluegrass, Spring Grass (*Eriochloa procera*) and Tropical Cupgrass (*Eriochloa fatmensis*). Although lands located to the south of Taraborah Creek (Community 11c) are also dominated by Buffel, native grasses such as *Dichanthium* spp. are more abundant throughout this area. A *Secondary* Transect within this community consisted of 98% grass cover and 2% herb species.

A list of the dominant flora species occurring throughout the non-remnant grassland is provided in Table 16.



Photo Plate 11 Community 11 – Non-remnant Grassland

Table 16 Dominant Flora of Community 11 – Non-remnant grassland

Layer	Relative Dominance	Scientific Name	Common Name
Canopy (to 15 m)	Occasional	<i>Eucalyptus melanophloia</i>	Silver-leaved Ironbark
	Occasional	<i>Eucalyptus cambageana</i>	Dawson Gum
	Occasional	<i>Corymbia tessellaris</i>	Moreton Bay Ash
	Occasional	<i>Corymbia intermedia</i>	Pink Bloodwood
	Occasional	<i>Acacia shirleyi</i>	Lancewood
Shrub (1 – 2.5 m)	Occasional	<i>Acacia holosericea</i>	Soap Bush
	Occasional	<i>Capparis lasiantha</i>	Wait-a-while
	Occasional	<i>Carissa ovata</i>	Currant Bush
	Occasional	<i>Eremophila mitchellii</i>	False Sandalwood

Layer	Relative Dominance	Scientific Name	Common Name
	Occasional	<i>Lysiphyllum hookeri</i>	Bauhinia
	Occasional	<i>Acacia harpophylla</i>	Brigalow
	Occasional	<i>Alphitonia excelsa</i>	Red Ash
	Occasional	<i>Vachellia farnesiana</i> *	Mimosa Bush
Ground (0 – 1 m)	Dominant	<i>Cenchrus ciliaris</i> *	Buffel Grass
	Associated	<i>Melinis repens</i> *	Red Natal Grass
	Associated	<i>Chloris inflata</i> *	Purpletop Chloris
	Associated	<i>Chloris gayana</i> *	Rhodes Grass
	Associated/Occasional	<i>Dichanthium</i> spp.	
	Occasional	<i>Juncus usitatus</i>	Common Rush
	Occasional	<i>Parthenium hysterophorus</i> *	Parthenium
	Occasional	<i>Xanthium pungens</i> *	Noogoora Burr

* introduced species

6.3.11.3 Conservation Status

This community is highly disturbed and is not considered to be consistent with any regional ecosystems as described by the REDD (Queensland Herbarium 2011). This community is not listed under the federal EPBC Act. No flora species of conservation significance were recorded within the Low Open Grassland community.

6.3.12 Community 12 – Palustrine Wetland

6.3.12.1 Location

This community occurs in association with the palustrine wetlands (Photo Plate 12) located in the north of the Project site. The locations of this community are generally consistent with the palustrine wetlands mapped by DEHP. However, ground truthing revealed that the extent of this community in the north-west corner of the site is larger than the DEHP mapped wetlands, incorporating two palustrine wetlands occurring in close proximity to each other.

6.3.12.2 Community Description

Woody Species

Woody species diversity within this community is limited to Mimosa Bush and Lignum (*Muehlenbeckia florulenta*) with occasional juvenile Eucalypts (*Eucalyptus* sp.). A secondary transect woody stem count recorded 8 shrub stems.

Groundcover



The ground layer consists of a co-dominant composition of native Umbrella Canegrass and introduced Nutgrass (*Cyperus rotundus*). Buffel Grass occurs throughout this community as a sub-dominant species. Native occasional ground layer species include *Panicum decompositum* var. *decompositum*, Sesbania Pea (*Sesbania cannabina*) and Common Nardoo (*Marsilea drummondii*). Exotic groundcover species include Fireweed and Variegated Thistle. A secondary transect within this community consisted of 38% grass cover, 60% sedge cover and 2% cover of herbs.

A list of the dominant flora species associated with the Palustrine Wetlands is provided in Table 17.



Photo Plate 12 Community 12 – Palustrine Wetland

Table 17 Dominant Flora of Community 12 – Palustrine Wetland

Layer	Relative Dominance	Scientific Name	Common Name
Shrub (0 – 3 m)	Dominant	<i>Acacia farnesiana</i> *	Mimosa Bush
	Occasional	<i>Muehlenbeckia florulenta</i>	Lignum
	Occasional	<i>Eucalyptus</i> sp. (juvenile)	
Ground (0 – 2 m)	Co-dominant	<i>Leptochloa digitata</i>	Umbrella Canegrass
	Co-dominant	<i>Cyperus rotundus</i> *	Nutgrass
	Associated	<i>Cenchrus ciliaris</i> *	Buffel Grass
	Occasional	<i>Senecio madagascariensis</i> *	Fireweed
	Occasional	<i>Silybum marianum</i> *	Variegated Thistle
	Occasional	<i>Marsilea drummondii</i>	Common Nardoo
	Occasional	<i>Panicum decompositum</i> var. <i>decompositum</i>	
	Occasional	<i>Sesbania cannabina</i>	Sesbania Pea

* introduced species

6.3.12.3 Conservation Status

This community is generally consistent with RE 11.3.27 – freshwater wetlands. This community is not listed under the federal EPBC Act. Despite targeted searches, no flora species of conservation significance were recorded from this community.

6.3.13 Community 13 – Lacustrine Wetland

6.3.13.1 Location

Community 13 occurs in association with two Lacustrine wetlands (Photo Plate 13) located in the central-west of the Project site.

6.3.13.2 Community Description

Woody species

This community contains a very sparse canopy layer consisting of regrowth Brigalow to a height of 8 m. The shrub layer occurs to a height of 2 m and is dominated by exotic species including Mimosa Bush, Parthenium and Parkinsonia. Two of these species, Parthenium and Parkinsonia are listed as Weeds of National Significance and Class 2 declared pest plants under the LP Act. The woody stem count completed within a secondary transect recorded one Brigalow stem.



Groundcover

The ground layer exhibits a co-dominant composition of White Smartweed (*Persicaria attenuata* subsp. *attenuata*) and Couch (*Cynodon dactylon* var. *dactylon*). In some areas, Couch is replaced by Buffel Grass as the co-dominant species. Awnless Barnyard Grass occurs in association with this community. Johnson Grass (*Sorghum halepense*) occurs on occasion as a result of the surrounding sorghum cropping land use. Occasional sedges present include *Cyperus dactyloides* and Pale Spikerush (*Eleocharis pallens*). A secondary transect within this community consisted of 18% aquatic emergents, 47% grass cover, 6% herbs and 32% cover of regenerating shrub species.

A list of the more commonly encountered flora species of Community 12 is provided in Table 18.



Photo Plate 13 Community 13 – Lacustrine Wetland

Table 18 Dominant Flora of Community 13 – Lacustrine Wetland

Layer	Relative Dominance	Scientific Name	Common Name
Canopy (6 – 8 m)	Occasional	<i>Acacia harpophylla</i>	Brigalow
Shrub (1 – 2 m)	Occasional	<i>Acacia farnesiana</i> *	Mimosa Bush
	Occasional	<i>Parthenium hysterophorus</i> *	Parthenium
	Associated	<i>Parkinsonia aculeata</i> *	Parkinsonia
Ground (0 – 1 m)	Co-dominant	<i>Persicaria attenuata</i> subsp. <i>attenuata</i>	White Smartweed
	Co-dominant	<i>Cynodon dactylon</i> var. <i>dactylon</i>	Couch
	Associated	<i>Cenchrus ciliaris</i> *	Buffel Grass
	Associated	<i>Echinochloa colona</i> *	Awnless Barnyard Grass
	Occasional	<i>Sorghum halepense</i> *	Johnson Grass
	Occasional	<i>Eleocharis pallens</i>	Pale Spikerush
	Occasional	<i>Cyperus dactyloides</i>	

* introduced species

6.3.13.3 Conservation Status

Community 13 is not consistent with any regional ecosystems as described by the REDD (Queensland Herbarium 2011). This community is not listed under the federal EPBC Act. No flora species of conservation significance were recorded from this community.

6.3.14 Potential Natural Grassland

Several areas of Community 11 are mapped by DEHP as Natural Grassland REs (e.g. RE 11.8.11 – ‘*Dichanthium sericeum* grassland on Cainozoic igneous rocks’). These areas are now dominated by buffel grass and, generally, are no longer considered to be representative of the mapped RE. One area of DEHP-mapped Natural Grassland that coincides with the proposed infrastructure area, will be treated as consistent with RE 11.8.11 for the purpose of this Flora and Fauna Assessment, despite being considered to constitute Non-remnant Grassland following field surveys. This approach has been adopted to account for potential impacts to Potential Natural Grassland prior to further ground-truthing to determine its presence on the Project site. These areas will be referred to as ‘Potential Natural Grassland’. Consequently, these areas are classified as Of Concern under the VM Act and DEHP Biodiversity Status, and Endangered under the EPBC Act. Offsets to these areas of Potential Natural Grassland are detailed in Section 8.3.



6.3.15 Accuracy of Regional Ecosystem Mapping

Site surveys and ground-truthing of Regional Ecosystem mapping has revealed inconsistencies in relation to current remnant vegetation mapping over the Project site. The majority of the Project site has been subject to anthropogenic disturbances such as vegetation clearing, cropping and cattle grazing. Large areas mapped as woodland or open forest remnant vegetation (e.g. RE 11.8.5 '*Eucalyptus orgadophila* open woodland on Cainozoic igneous rocks', RE 11.4.9 '*Acacia harpophylla* shrubby open forest to woodland with *Terminalia oblongata* on Cainozoic clay plains', etc.) have been reduced to grasslands with scattered shrubs and trees.

The current RE mapping indicates that endangered RE 11.9.1 '*Acacia harpophylla*-*Eucalyptus cambageana* open forest to woodland on fine-grained sedimentary rocks' occurs in several areas throughout the Project site, and most notably, in association with Taroborah Creek. Site surveys revealed that the vegetation community occurring along Taroborah Creek is representative of RE 11.3.3a – 'Riverine wetland or fringing riverine wetland. *Melaleuca bracteata* woodland on alluvial plains is listed as "Of Concern" under the VM Act.

Riparian vegetation associated with Retreat Creek in the north of the site is considered to be representative of the Least Concern RE 11.3.25 '*Eucalyptus tereticornis* or *E. camaldulensis* woodland fringing drainage lines'. Current RE mapping along this creek consists of an Endangered sub-dominant mixed polygon, RE 11.3.2/11.3.25/11.3.3/11.3.1 (45/35/15/5). Flora surveys along Retreat Creek failed to detect RE components other than 11.3.25, and in particular did not record the Endangered RE type (i.e. RE 11.3.1 – '*Acacia harpophylla* and/or *Casuarina cristata* open forest on alluvial plains').

7.0 FAUNA RESULTS AND DISCUSSION

A total of 124 vertebrate fauna species were positively identified within the survey area. This comprised seven amphibians (one introduced), eight reptiles, eighty-one birds and twenty-eight mammals (six introduced). A complete list of all observed fauna species is provided in Appendix F.

7.1 AMPHIBIANS

7.1.1 Habitat Values

Many amphibian species occurring in Australia's drier regions are burrowing species capable of spending several years underground awaiting heavy rain, after which they come to the surface to feed and breed. This behaviour is referred to as aestivation and assists in water preservation and survival during prolonged periods of drought (Withers 1995). Consequently, the vast majority of amphibians from seasonally dry regions only occur in areas where the ground is soft enough to allow digging during wet periods.

Non-burrowing frog species also inhabit drier regions where they adopt different survival strategies, such as sheltering deep in tree hollows or cool rock crevices. However, these species are still typically associated with water sources.

Due to the ephemeral nature of the creeks at the Project site, only stock watering points (dams) and two permanent water holes within creeks were observed to be holding water during the dry season surveys. Most creeks on the Project site contained a sandy substrate and were soft enough for burrowing frogs.

7.1.2 Observed Species

Seven amphibian species including one introduced species, the Cane Toad (*Rhinella marina*), were observed within the Project site. Native amphibian species recorded within the Project site include the Greenstripe Frog (*Cyclorana alboguttata*), Spotted Grassfrog (*Limnodynastes tasmaniensis*), Green Tree Frog (*Litoria caerulea*), Broad-palmed Rocket Frog (*Litoria latopalmata*; refer to Photo Plate 14), Ornate Burrowing Frog (*Platyplectrum ornatum*) and Chubby Gungan (*Uperoleia rugosa*).



Photo Plate 14 The broad-palmed rocket frog (*Litoria latopalmata*)

7.1.3 Amphibians of Conservation Significance

No amphibians of conservation significance were observed on the Project site during the survey period, despite targeted searches for the species listed under the NC Act or EPBC Act that may occur in the area, i.e. the Rough Collared Frog (*Cyclorana verrucosa*) (refer to Table 3).

7.2 REPTILES

7.2.1 Habitat Values

Australia's environments support an extremely diverse assemblage of reptile species, which exploit a wide array of micro-habitats (e.g. tree hollows, soil cracks) and food sources (e.g. succulent leaves, termites, grasshoppers, birds and other reptiles) (Pianka 1969a, b). This diversity encompasses species of widely different body sizes (skinks *cf.* goannas), and adaptive evolutionary strategies (burrowing blind snakes *cf.* arboreal geckos).

The structural diversity of habitat types on the Project site ranged from woodlands with a dense stratum of fallen timber, to open woodlands with sandy loam soils that reptiles can easily burrow into, to non-remnant grassland with dense tussocky groundcover and little canopy. This structural diversity provides a diversity of habitat types for a variety of reptile species.

7.2.2 Observed Species

A total of eight reptile species were observed within the Project site. These species were the Open Litter Rainbow Skink (*Carlia pectoralis*), Robust Striped Skink (*Ctenotus robustus*; shown in Photo Plate 15), Carpentaria Whip Snake (*Cryptophis boschmai*), Black-headed Python (*Aspidites melanocephalus*), Keelback (*Tropidonophis mairii*), *Lerista fragilis*, Iridescent Litter-skink (*Lygisaurus foliorum*) and a gecko that could not be identified to species level (*Gekkonidae* sp.).



Photo Plate 15 The robust striped skink (*Ctenotus robustus*)

7.2.3 Reptile Species of Conservation Significance

No reptiles of conservation significance were recorded on the Project site at the time of the surveys, despite targeted searches for species listed under the NC Act or EPBC Act that may occur in the area (refer to Table 3).

7.3 BIRDS

7.3.1 Habitat Values

Avian assemblages are generally determined by factors such as food (e.g. fruit, nectar, seeds and insects) and water sources, as well as the mosaic of habitat structures such as grasses, thick understorey and canopy vegetation. Generally, the more food sources available and the more complex the structure of the vegetation, the more diverse the avifauna assemblage will be.



Food sources within the Project site included a variety of grass seeds, nectar, insects and vertebrate prey items. Soft fruiting species suitable for birds do not occur in high densities within the Project site. The Project site exhibits relatively low habitat complexity. Although the Project site comprises riparian and wetland habitats, the majority of the project site is highly disturbed comprising exotic grasslands and croplands.

7.3.2 Observed Species

A total of 81 bird species were recorded within the survey area during the terrestrial fauna surveys. One of these species, the Cattle Egret (*Ardea ibis*) is listed as Migratory under the EPBC Act.

Many bird species were observed using lacustrine systems located within the Project site. Species using these dams and other bodies of standing water include, but are not limited to, the Brolga (*Grus rubicunda*), Australasian Darter (*Anhinga novaehollandiae*), Straw-necked Ibis (*Threskiornis spinicollis*), Cattle Egret (*Ardea ibis*), Intermediate Egret (*Ardea intermedia*), Black Swan (*Cygnus atratus*), Plumed Whistling Duck (*Dendrocygna cytoni*), Hardhead (*Aythya australis*), Australian Pelican (*Pelecanus conspicillatus*) and the White-necked Heron (*Ardea pacifica*).

Seven raptor species were identified during the course of the survey. These were the Wedge-tailed Eagle (*Aquila audax*), Brown Falcon (*Falco berigora*), Whistling Kite (*Haliastur sphenurus*), Black-shouldered Kite (*Elanus axillaris*), Little Eagle (*Hieraaetus morphnoides*), Nankeen Kestrel (*Falco cenchroides*) and Brown Goshawk (*Accipiter fasciatus*).

Many of the most commonly encountered birds are insectivorous, including such species as the Australian Magpie (*Gymnorhina tibicen*), Willy Wagtail (*Rhipidura leucophrys*), Apostlebird (*Struthidea cinerea*), Superb Fairy-wren (*Malurus cyaneus*), Varigated Fairy-wren (*Malurus lamberti*) and Red-backed Fairy-wren (*Malurus melanocephalus*). The wide array and abundance observed in these birds is due to the readily available prey, and their ability to colonise all available habitats. Parrots were also very commonly encountered and often seen feeding on grain crops, although also frequently seen within remnant vegetation. Common parrot species include the Sulphur-crested Cockatoo (*Cacatua galerita*), Galah (*Eolophus roseicapillus*), Red-winged Parrot (*Aprosmictus erythropterus*) and Pale-headed Lorikeet (*Platycercus adscitus*). A complete list of species observed on the Project site during the surveys is provided in Appendix F.

7.3.3 Bird Species of Conservation Significance

No bird species of conservation of significance were recorded during the survey, despite targeted searches for species listed under the NC Act or EPBC Act that may occur in the area (Table 3).

7.3.4 Listed Migratory and Marine Species

One Migratory species listed under the EPBC Act was observed within the Project site during the survey, the Cattle Egret (*Ardea ibis*). This species is widespread throughout eastern Queensland and given the availability of similar habitat in the region it is unlikely the Project will have any significant impacts upon the species.



7.4 MAMMALS

7.4.1 Habitat Values

The morphology of mammal species varies widely from small rodents to larger kangaroos and even bats. The ecology of each of group is equally variable and they are assessed separately in the following sections.

Small Mammals

Habitats suitable for small mammals include areas that provide a plentiful food source and suitable shelter. The highest density of small mammal species is usually associated with:

- Reliable rainfall which is reflected in a reliable source of food; and
- Dense ground vegetation, particularly shrubs and grasses.

The diversity of small mammals is often limited by the lack of a predictable food supply and open ground vegetation. Consequently, small mammal populations can fluctuate dramatically in response to rain, which increases seed production and insect abundance. During less favourable periods, small mammal populations can be very low.

Habitats within the Project site include riparian woodlands, open woodlands with adequate groundcover in the form of grasses, and non-remnant grassland with dense groundcover and sparse shrub and canopy cover.

Medium and Large Mammals

Factors affecting the occurrence of medium-sized mammals are varied. Important factors can include land-clearing, feral animal predation and grazing pressures. Consequently, medium-sized mammals are no longer abundant in most of eastern Australia.

Habitats on the Project site do not include areas of dense native vegetation. Rather, open woodland and non-remnant grasslands are typical of the region, which is likely to be reflected in the medium-sized mammal community.

In contrast, larger mammals such as kangaroos have been much less affected by predation and land clearing activities. In fact, many species have flourished in response to increasing grasslands and their populations are now likely to be above historical levels. Habitat for this group on the Project site commonly occurs throughout the region.

Arboreal Mammals

The majority of arboreal mammals that occur in Australia utilise tree hollows for nesting and shelter. Smith and Lindenmayer (1988) consider that a shortage of nest hollows is likely to limit arboreal mammal populations where the density of hollow bearing trees is less than two to eight trees per hectare. Large hollow-bearing trees in the broader area generally occur along creek lines or in small pockets of remnant vegetation and are usually scattered, separated by open areas that would be difficult for arboreal mammals to cross without venturing onto the ground. It is likely that such habitat is too open for many arboreal mammals and very few are known to occur within the broader region.



Bats

The density and diversity of Australian bat species is determined primarily by the availability of suitable nesting and roosting sites. Roosting sites can include locations such as thick foliage, loose exfoliating bark, rock caves or cavities, tree hollows or even fabricated structures such as old buildings and culverts (Churchill 1998).

Consequently, areas with a large number of hollow-bearing trees that occur within remnant vegetation are of high value to many bat species. As bats have a small body size, these hollows can be much smaller in size than required by arboreal mammals. Suitable hollows were present in the Project site, including larger senescing trees in the woodlands, particularly in the riparian areas. Habitats such as these appear common within the region, particularly within the adjoining Fairbairn State Forest.

7.4.2 Observed Species

A total of twenty-eight mammal species were positively identified within the Project site, including six introduced species and thirteen microbat species.

The most common mammal species to occur on the Project site were the Eastern Grey Kangaroo (*Macropus giganteus*), Red-necked Wallaby (*Macropus rufogriseus*), Common Wallaroo (*Macropus robustus*), Swamp Wallaby (*Wallabia bicolor*) and the introduced House Mouse (*Mus musculus*). Less commonly observed native species were the Northern Brown Bandicoot (*Isodon macrourus*; shown in Photo Plate 16), Common Planigale (*Planigale maculata*), and Echidna (*Tachyglossus aculeatus*). Introduced species observed included the House Mouse, Feral Pig (*Sus scrofa*), Dingo/Wild Dog (*Canis lupus dingo*), Feral Cat (*Felis catus*) and the European Rabbit (*Oryctolagus cuniculus*). Four of the five introduced mammal species recorded on the Project site (i.e. Feral Pig, Dingo/Wild Dog, Feral Cat and European Rabbit) are classified as 'Class 2' pest animals under the LP Act. Domestic Cattle (*Bos taurus*) were also frequently encountered as most of the Project site is dedicated to agricultural land uses. All mammal species recorded on the Project site during the current survey are listed in Appendix F. Fact sheets for pest species are included in Appendix G.



Photo Plate 16 The northern brown bandicoot (*Isoodon macrourus*)

Thirteen microbat species have been positively identified from echolocation calls recorded from the Project site. These are White-striped Freetail Bat (*Austronomus australis*), Gould's Wattled Bat (*Chalinolobus gouldii*), Chocolate Wattled Bat (*Chalinolobus morio*), Little Pied Bat (*Chalinolobus picatus*), Little Broad-nosed Bat (*Scotorepens greyii*), Inland Broad-nosed Bat (*Scotorepens balstoni*), Inland Forest Bat (*Vespadelus baverstocki*), *Miniopterus orianae oceanensis*, Northern Freetail Bat (*Chaerephon jobensis*), Yellow-bellied Sheath-tail Bat (*Saccolaimus flaviventris*), Beccari's Freetail Bat (*Mormopterus beccarii*), Little North-eastern Freetail Bat (*Mormopterus loriae ridei*) and long-eared bats (*Nyctophilus* species). One of these species, *Chalinolobus picatus* is listed as Near Threatened under the NC Act.

Some bat species have very similar calls and there can be confusion between species. Additional microbat species that could not be positively identified but may occur within the study area include the Eastern Cave Bat (*Vespadelus troughtoni*), Little Broad-nosed Bat (*Scotorepens greyii*) or Northern Broad-nosed Bat (*Scotorepens sanborni*), Broad-nosed Bats (*Scotorepens* spp.) or Hoary Wattled Bat (*Chalinolobus nigrogriseus*), Inland Forest Bat (*Vespadelus baverstocki*) or Little Forest Bat (*Vespadelus vulturnus*) and Troughton's Sheath-tail Bat (*Taphozous troughtoni*). Calls of *Scotorepens* species and *Chalinolobus nigrogriseus* overlap in frequency (37 – 40 kHz) and can be difficult to differentiate. Many calls were attributed to *Scotorepens* spp. based on pulses with relatively short duration characteristic section and no tail or up-curved tail. A few calls, however, had more angular pulse shape with longer duration characteristic section. These could have been either *Scotorepens* spp or *C. nigrogriseus*. Calls of *Taphozous troughtoni* fall within the same frequency as *Mormopterus beccarii* and identification is difficult. Due to a high chance of confusion with other species and the

limited distribution of this species to north-western QLD (Churchill 1998), it is highly unlikely that this species inhabits the Project site. None of these species are listed as a species of conservation significance under the NC Act, or the EPBC Act.

Refer to Appendix H for AnaBat results.

7.4.3 Mammals of Conservation Significance

One mammal species of conservation significance, the Little Pied Bat (*Chalinolobus picatus*), was positively recorded within the Project site during the dry season survey as well as the supplementary AnaBat survey (August 2012). *Chalinolobus picatus* is listed as Near Threatened under the NC Act. Despite targeted searches for species listed under the NC Act or EPBC Act that may occur in the area (refer to Table 3) no other species of conservation significance were recorded.

7.5 OTHER THREATENED SPECIES KNOWN FROM THE REGION

A total of 24 threatened species known to occur in the region were identified from wildlife database searches (Appendix A) and other scientific literature searches (refer to Table 3). Targeted searches for these species were completed during field surveys. Appendix B outlines habitat requirements of those species not recorded from the Project site and notes the likelihood of occurrence given the on-site habitat values. The assessment is based on the knowledge and opinion of AARC field ecologists, information obtained from site visits, scientific literature and communications with relevant experts or interest groups.

7.6 PEST SPECIES

Six introduced pest fauna species were recorded within the Project site during field surveys. Pest species recorded within the Project site include:

- House Mouse (*Mus musculus*);
- Cane Toad (*Rhinella marina*);
- Feral Cat (*Felis catus*);
- Dingo (*Canis lupus dingo*);
- European Rabbit (*Oryctolagus cuniculus*); and
- Feral Pig (*Sus scrofa*).

Four of these species – the Feral Cat, Dingo, European Rabbit and Feral Pig – are declared class 2 pest species as listed within the schedules of the LP Act.

The Cane Toad and House Mouse are non-declared species under the LP Act, meaning that there is no legislative need for their control within the Project site. However, it is recommended that the activities within the Project site should not facilitate any increase in the population numbers of non-declared animals.

Pest Fact Sheets (made available by DAFF) of the pest fauna species which were identified within the Project site detail the most effective methods of control. Pest Fact Sheets should be consulted (Appendix G) when requiring pest management strategies.



8.0 POTENTIAL IMPACTS AND SUGGESTED MANAGEMENT STRATEGIES

8.1 ENVIRONMENTAL VALUES

The Project site has been subject to previous clearing and agricultural land uses. As a result, the majority of the subject site currently consists of cleared grasslands, croplands and grazing land. The extensive areas of grassland (comprising approximately 73% of the Project site) are largely dominated by the introduced pasture grass known as Buffel Grass. During the terrestrial flora and fauna surveys, a total of 33 weed species, including 4 State declared pest species and WONS were recorded on the Project site.

Despite previous disturbances on the Project site, small patches of remnant vegetation have been retained in association with Taraborah Creek, Retreat Creek and Fairbairn State Forest. Small stands of regrowth vegetation also occur throughout the Project site.

Habitats within the Project site include riparian woodlands, open woodlands with adequate groundcover in the form of grasses and non-remnant grassland with dense groundcover and sparse shrub and canopy cover. Although the large areas of grassland may provide suitable forage resources for macropods, these areas provide little habitat value for canopy dependant species such as insectivorous / nectarivorous birds and bats plus arboreal mammals.

Habitat and corridor values on the Project site are greatest in the riparian areas and woodland habitats adjoining Fairbairn State Forest. Large hollow-bearing trees occurring along the creek lines or in small pockets of remnant vegetation provide habitat and movement opportunities for arboreal mammals. Within the Project site, these habitat areas are largely scattered, separated by open areas that would be difficult for arboreal mammals to cross without venturing onto the ground. Riparian and woodland habitats on the Project site also provide suitable bat roosting sites in the form of hollow-bearing habitat trees including larger senescing trees. Habitats such as these appear common within the region, particularly within the adjoining Fairbairn State Forest.

Structural diversity on the Project site provides a range of habitat types for a variety of reptile species. Suitable reptile habitats present include woodland habitats with a dense stratum of fallen timber, open woodlands with sandy loam soils that reptiles can easily burrow into plus non-remnant grasslands with dense tussocky groundcover and little canopy.

Watercourses on the site are ephemeral and were not observed to be flowing during the dry season survey. However, most creeks on the Project site contained a sandy substrate and were soft enough for burrowing frogs. Several dams and some small waterholes in creek channels provided permanent water throughout the year. A floodplain wetland is present in the north-west of the Project site but contained very little water during the dry season survey. Permanent water bodies throughout the Project site are likely to support a variety of common amphibian species.

Riparian habitat is in good condition across much of the Project site but grazing pressures have caused bank erosion and siltation in some of the more accessible areas.



Vegetation community specific values include:

- The River Red Gum Riparian Woodland (RE 11.3.25) and River Teatree Riparian Woodland (RE 11.3.3a) potentially function as fauna movement corridors and offer refuge for fauna by providing water, shade and mature, hollow-bearing tree species;
- Fallen timber within the Brigalow Woodland (RE 11.9.1) has the potential to provide a distinct microhabitat for certain fauna, including the listed Yakka Skink and Brigalow Scaly Foot; and
- The relatively intact patches of River Red Gum Riparian Woodland, River Teatree Riparian Woodland, Lancewood Woodland, Brigalow Woodland and Dawson Gum Open Woodland are representative of various regional ecosystems and have the potential to contribute to the overall preservation of threatened ecosystems.

8.2 POTENTIAL IMPACTS

Potential impacts of the Project include habitat loss, increased traffic, noise, dust and artificial lighting over a greater area than currently exists.

Each habitat type, including woodlands, grasslands and riparian woodlands, provides unique habitat which supports ecological processes within the landscape. Ecotones (boundaries between vegetation communities) may be especially important for resources, as these areas frequently have a higher diversity and abundance of species (Hunter 1990).

The following potential Project impacts upon nature conservation values may occur as a result of the Project:

- Land clearing for the Project will reduce the current extent of vegetation communities and associated faunal habitats. The extent of disturbance within each vegetation community and associated RE is summarised in Table 19 and shown in Figure 8;
- The construction of the eastern open-cut mine haul road through Community 4 (Brigalow Woodland (RE 11.9.1)) will result in the loss of a limited area of Brigalow vegetation;
- The construction of the western portion of the open-cut pit and the spoil dumps will result in the loss of a majority the potential Natural Grassland (RE11.8.11), although further ground-truthing is expected to significantly reduce the extent of (or remove entirely) this community from the Project site;
- The injury or death of terrestrial fauna species may occur during the lifetime of the Project, with the greatest potential to occur during the construction phase;
- Edge effects resulting from the proposed works can include the introduction and establishment of weeds, alteration to microclimatic conditions (such as greater light intensity, more wind penetration, lower humidity) and a reduction in plant health through loss of photosynthetic potential (as a result of plants being covered by dust generated from vehicle movement on unsealed tracks). In the absence of appropriate control measures, the Project has the potential to cause impacts in relation to edge effects, predominantly in relation to the introduction and / or spread of weed species throughout the Project site;



- Additional noise from mine site operations may disturb fauna on the Project site. Noise effects can be highly species dependant and may vary widely. Impacts from noise will be concentrated around the open-cut pit / process plant / haul roads / decline area, whilst the rest of the majority of the Project site and associated habitat types will be unaffected;
- Increased lighting may affect both nocturnal and diurnal fauna. The effects of artificial lighting will vary with different species. Additional lighting commonly attracts insects, which will result in a higher abundance of amphibians, microbats and reptiles who will be able to take advantage of concentrated, light-attracted prey;
- Loss of habitat may result in a loss of biological diversity (with associated removal of leaf litter, hollow bearing trees, fallen timber and resultant changes to soil biota);
- A change in population dynamics may occur, although it is not expected to be significant. Species most susceptible to a decline are low mobility species. Species such as amphibians and smaller reptiles may become genetically isolated;
- Land clearing activities associated with the Project may increase soil erosion, inadvertently causing silting or sedimentation of riverine habitats and waterholes downstream. Soil erosion may also trigger a loss of nutrients to one area, causing a disruption of natural nutrient cycling;
- Processing and mining activities on the Project site may contaminate riverine habitats and waterholes downstream;
- The Project site may encounter an increase in pest fauna species (including the cane toad, European rabbit, feral pig and feral cat) due to the increased availability of food sources which will occur once the Project site is operational;
- The introduction of additional weed species and spread of weeds on the Project site via transport of seeds on vehicles and machinery; and
- The proposed Project includes underground mining north of the Capricorn Highway. Underground longwall mining will result in surface subsidence and tension cracking. The area that will be subject to subsidence is shown in Figure 8. Longwall mining will be conducted beneath six vegetation communities (Communities 3, 6, 7, 8, 9 and 11) and one lacustrine wetland (Community 13). The impacts of subsidence on wetlands and watercourses are discussed in the Aquatic Ecology Assessment for the Project.

IMC Mining Group Pty Ltd (IMC) was commissioned by Shenhua to prepare a subsidence assessment based on the current mine layout for the Project. The assessment provides predictions for the nature and extent of surface subsidence impacts (strain, tilt and cracking at the surface). In the worst case scenario, surface subsidence would result in a decline in land elevation of up to approximately 2 m and tension cracks may occur to a depth of 5 m with a maximum width of 0.2 to 0.3 m. An assessment of pre and post-mining topography predicted identified the changes in land elevation that will occur following longwall mining and subsidence.

The potential impacts of surface subsidence are described below.

- Land subsidence may impact on any of the seven vegetation communities located above the underground mining footprint. Direct impacts on these communities may



include destabilising root systems, increasing land elevation angles and changing surface-soil drainage patterns;

- The drainage profile may experience subtle changes as a result of subsidence. The predicted minor changes in topography may result in additional ponded areas. While most areas of ponding would be shallow and dry quickly after rainfall events, prolonged ponding of surface water, if not mitigate in a timely manner, may provide additional habitat for Cane Toads;
- Significant areas of artificial long-term ponding also have the potential to cause changes in vegetation type or remnant status. While the majority of the area to be impacted by subsidence consists of non-remnant grasslands and croplands, some areas of remnant vegetation may be impacted by subsidence-induced ponding. In the event that subsistence leads to the creation of ponded areas of significant depth (i.e. 1 m or greater) there could be significant impacts on remnant vegetation. If not mitigated in a timely matter, such changes in hydrological regime can cause dieback of terrestrial flora species resulting in the loss of remnant vegetation and/or a shift in community composition to wetland species;
- Surface cracking occurs as a result of tensile strain on the ground surface. Tension cracking may occur throughout the subsidence impact area. It is expected that any cracks will be less than 5 m deep and a maximum width of 0.2 to 0.3 m in the worst case scenario. While tension cracking will not necessarily impact on vegetation communities, the rehabilitation of cracks will involve remedial earthworks and may lead to impacts on vegetation.

Table 19 Disturbance to Vegetation Communities and Regional Ecosystems within the Project Site

	Vegetation Community	Regional Ecosystem Equivalents	VM Act Status	EHP Biodiversity Status	EPBC Act Status	Total Area (ha)	Total Disturbance Area including Subsidence (ha)	Total Area to be Cleared (ha)
1	River Red Gum Riparian Woodland	RE 11.3.25	Least Concern	Of Concern	-	190.1	0	0
2	River Teatree Riparian Woodland	RE 11.3.3a	Of Concern	Of Concern	-	143.0	0	0
3	Lancewood Woodland	RE 11.10.3	Least Concern	No Concern	-	95.2	11.2	0
4	Brigalow Woodland	RE 11.9.1	Endangered	Endangered	Endangered	72.6	2.76	2.76
5	Dawson Gum Open Woodland	RE 11.4.8	Endangered	Endangered	Endangered	31.2	0	0
6	Silver-leaved Ironbark Open Woodland	RE 11.5.3	Least Concern	No Concern	-	191.2	31.9	0
7	Silver-leaved Ironbark Open Woodland	RE 11.3.6	Least Concern	Of Concern	-	33.2	33.2	0
8	Poplar Box Open Woodland	RE11.9.10	Of Concern	Endangered	-	130.9	67.0	0
9	Belah Low Open Woodland	RE 11.4.9*	-	-	-	4.1	4.1	0
10	Brigalow / Belah Low Open Woodland	RE 11.4.9	Endangered	Endangered	Endangered	8.5	0	0
11	Non-remnant Grassland	-	-	-	-	5,632.5	1701.6	314.11
12	Palustrine Wetlands	RE 11.3.27h	Least Concern	Of Concern	-	112.5	0	0
13	Lacustrine Wetlands	-	-	-	-	32.2	27.41	0
n/a	Potential Natural Grassland	RE 11.8.11	Of Concern	Of Concern	Endangered	163.5	149.43	149.43

* This community was considered to be equivalent with RE 11.4.9 in terms of species composition but did not satisfy all requirements that define remnant vegetation (i.e. >70% of the height and/or >50% of the cover relative to the undisturbed height and cover of a given RE). It is therefore not considered Endangered under the VM Act. Brigalow is neither dominant nor co-dominant; the community is therefore not considered Endangered under the EPBC Act. Source: AARC 2013



Project impacts on each vegetation community are shown in Figure 8 and summarised as follows:

- The Project will have no direct impacts on the following vegetation communities:
 - Community 1 – River Red Gum Riparian Woodland (RE 11.3.25);
 - Community 2 – River Teatree Riparian Woodland (RE 11.3.3a);
 - Community 5 – Dawson Gum Open Woodland (RE 11.4.8);
 - Community 10 – Brigalow / Belah Low Open Woodland (RE 11.4.9); and
 - Community 12 – Palustrine Wetlands.
- Potential subsidence impact upon a limited area of Community 3 – Lancewood Woodland (RE 11.10.3) located to the north-east of the Project site;
- A small strip of Community 4 – Brigalow Woodland (RE 11.9.1) occurring in the south of the subject site will be impacted as a result of the construction of a haul road;
- Potential subsidence impacts upon Community 6 – Silver-leaved Ironbark Open Woodland located in the north of the Project site;
- Potential subsidence impacts upon Community 7 – Silver-leaved Ironbark Open Woodland (RE 11.3.6) located in the north-east of the Project site;
- Potential subsidence disturbance for Community 8 – Poplar Box Open Woodland located in the north west;
- Potential subsidence disturbance for Community 9 – Belah Low Open Woodland (RE 11.4.9) located in the west-central portion of the Project site;
- The majority of the potential Natural Grassland (RE 11.8.11), located in the western portion of the open-cut pit and spoil pile area, will be impacted as a result of construction of these facilities;
- The Non-remnant Grassland community (Community 11) will experience the greatest areal extent of potential subsidence impact with approximately 1,701 ha being subjected to surface infrastructure construction, open-cut mining and subsidence by the Project; and
- Potential subsidence impacts upon the man-made dam located in the north-west of the Project site (Community 13 – Lacustrine Wetlands).

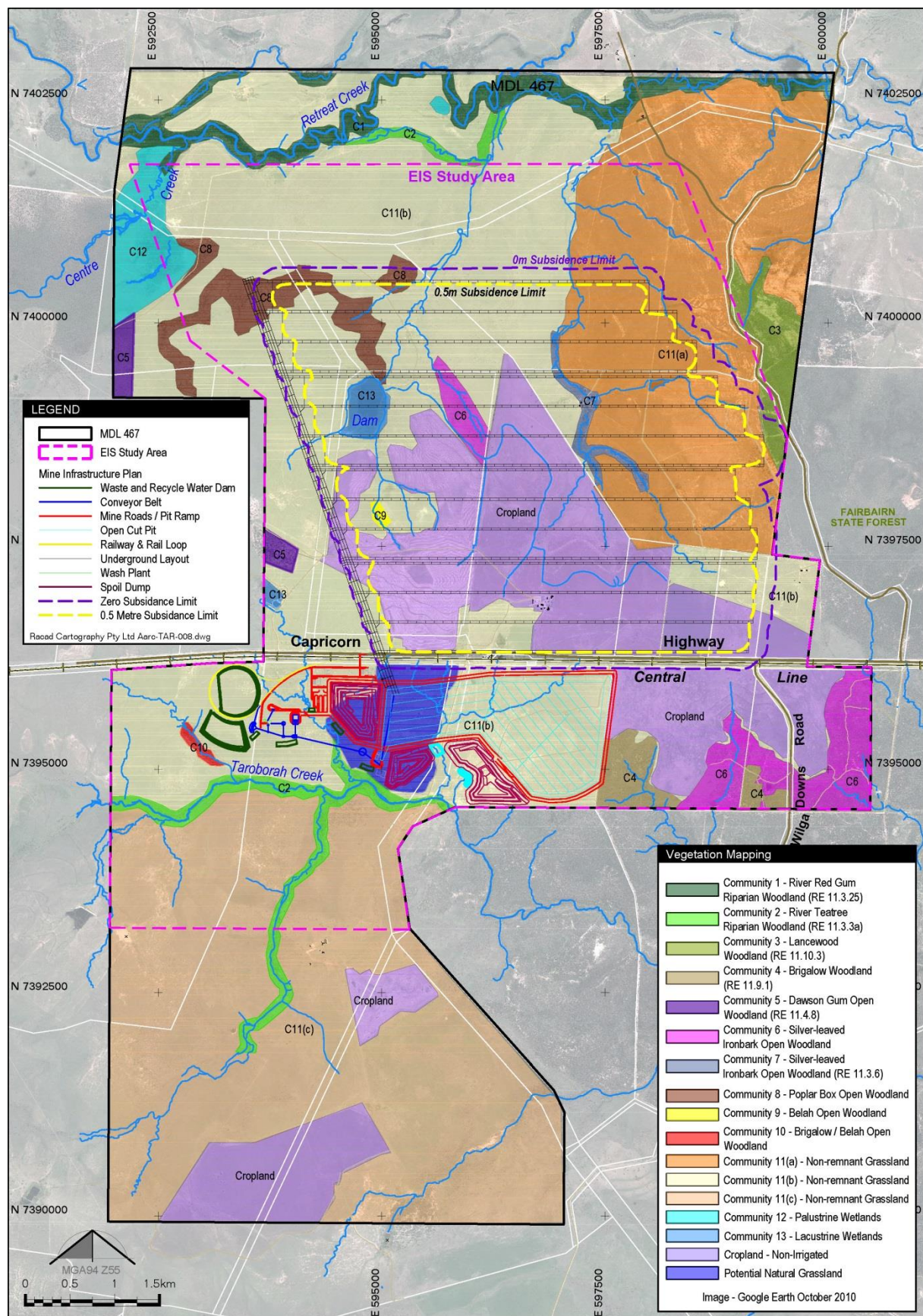


Figure 8 Impacts of the Project on Vegetation Communities



8.2.1 Impacts on Threatened Species

One threatened mammal species – the Little Pied Bat – was positively identified from AnaBat data recorded on the Project site during the dry season and supplementary surveys. This species was also identified as possibly recorded during the wet season survey. However, suitable habitat on both the Project site and the State Forest (located immediately to the east of the Project site) will not be impacted and therefore continue to provide significant areas for this species.

Fauna surveys on the Project site have also recorded the presence of one Migratory bird species, the Cattle Egret. The Project will not directly impact on any wetlands providing suitable habitat for this species. Given the vast distribution of this species throughout Australia and the presence of a significant wetland (i.e. Lake Maraboon) to the south of the Project site, the Project is not expected to have a significant impact on this species.

No flora species listed as threatened under the NC Act or EPBC Act were identified on the Project site. Therefore, the Project is not expected to impact on any flora species of conservation significance.

8.2.2 Dust Impacts to Vegetation Communities

Community 4 (Brigalow Woodland) is located immediately east of the open-cut pit in the south of the Project site. Activities conducted at the pit will generate dust (including coal dust) that has the potential to impact vegetation. However, prevailing winds on the Project site originate from the north-northeast through to the east and southeast, influencing the prevailing direction of dust dispersal. Due to the location of Community 4 to the east of the pit, prevailing winds will minimise potential impacts of dust on vegetation.

Community 10 (Brigalow / Belah Low Open Woodland) is located immediately adjacent to a dam in the west of the Project site. The dam is expected to result in minimal dust generation, precluding any significant impact to this vegetation community.

8.2.3 Cumulative Impacts

The potential ecological impacts identified above are considered as a consequence of the construction and operation of the Project. The incremental effect of multiple sources of impact (past, present and future) is referred to as 'cumulative impacts' (Contant & Wiggins 1991; Council on Environmental Quality 1978). These impacts may become exacerbated over time. Consideration of cumulative impacts is necessary so that impacts associated with the Project can be assessed with additional regional impacts from external sources.

External mining operations established in the future potentially present regional developments that may interact with the construction and operation of the Project.

Although no planned developments are identified in the immediate area of the project, such developments if they occur are likely to contribute additional ecological pressures on habitat and flora / fauna, such as vegetation clearing and further fragmentation of habitats.

8.2.4 Residual Impacts

Residual impacts remain after a Project's environmental management strategies, mitigation measures and rehabilitation methods have been conducted. Residual impacts for the Project include removal of vegetation and associated habitat. Where there is residual loss or degradation of vegetation, habitat or land use upon completion of mine decommissioning (or as residual impact identified prior to



decommissioning), compensation in the form of further habitat rehabilitation, compensatory habitat, land rehabilitation, contribution to research or offsets can be employed.

8.3 MANAGEMENT OF NATIVE FLORA AND FAUNA

Suggested strategies to minimise the impacts on native flora and fauna, and recommendations regarding rehabilitation of the Project site, are outlined below.

General principles of effective environmental management have been summarised as follows (in order of preference):

- Avoid environmental impacts;
- Minimise the impacts;
- Mitigate for impact; and
- Where an impact cannot be avoided or minimised, compensation for residual impact by mitigative means such as offsets.

Avoiding environmental impacts has been considered where possible throughout the Project planning and design phases. In particular, the boundaries of the Project site itself have been redefined since the dry season survey and include a 50 m buffer zone in order to minimise the area of impact and avoid disturbance to Fairbairn State Forest and certain conservation significant vegetation communities (i.e. Community 2, Community 10 and Community 4 for the most part). There will also be ongoing opportunities to further avoid impacts at a local scale through the detailed design process.

Suggested strategies to minimise the impacts on native flora and fauna, and recommendations regarding rehabilitation of the Project areas, are outlined below.

Vegetation Community 4 and the potential Natural Grassland Community were triggered as prescribed environmental matters due to their EPBC Act and VM Act conservation status. No other prescribed environmental matters were triggered under the QEOP, including wetlands, essential habitat, essential regrowth habitat, protected flora or fauna, connectivity or areas secured by an existing offset arrangement. These communities will require State and / or Federal Environmental Offset strategies to be developed, in order to contribute towards the long-term viability of the state's biodiversity. Vegetation Community 4 and the Potential Natural Grassland Community are the only communities of conservation significance that will be cleared.

In contrast, although Community 6, Community 7, Community 8 and Community 9 (which are listed as VM Act remnant watercourses or fall within the allocated buffer zones of VM Act listed watercourses) will be subject to subsidence, the subsidence slopes produced will be shallow (approximately 1.2%) and any tension cracks that are generated will be remediated, so that residual subsidence impacts are addressed.. However, if tension cracking and ponding in creeks persists following remedial action, offsets and ecological surveys will be undertaken at the end of mine life. Table 20 below summarises offset requirements for each community.



Table 20 Summary of Offset Requirements for each Community

Vegetation Community		Regional Ecosystem Equivalents	VM Act Status	EPBC Act Status	EPBC Offset	QEOP	Total area subject to offset requirement (ha)
1	River Red Gum Riparian Woodland	RE 11.3.25	Least Concern	-	No	No	0
2	River Teatree Riparian Woodland	RE 11.3.3a	Of Concern	-	No	No	0
3	Lancewood Woodland	RE 11.10.3	Least Concern	-	No	No (subsidence will not be a residual impact)	0
4	Brigalow Woodland	RE 11.9.1	Endangered	Endangered	Yes	Yes, VM Act Endangered	2.76
5	Dawson Gum Open Woodland	RE 11.4.8	Endangered	Endangered	No	No	0
6	Silver-leaved Ironbark Open Woodland	-	-	-	No	No (subsidence will not be a residual impact)	0
7	Silver-leaved Ironbark Open Woodland	RE 11.3.6	Least Concern	-	No	No (subsidence will not be a residual impact)	0
8	Poplar Box Open Woodland	-	-	-	No	No (subsidence will not be a residual impact)	0
9	Belah Low Open Woodland	RE 11.4.9*	-	-	No	No	0
10	Brigalow / Belah Low Open Woodland	RE 11.4.9	Endangered	Endangered	Yes	Yes, VM Act and EPBC Act Endangered	0



Vegetation Community		Regional Ecosystem Equivalents	VM Act Status	EPBC Act Status	EPBC Offset	QEOP	Total area subject to offset requirement (ha)
11	Non-remnant Grassland	-	-	-	Not Applicable	Not Applicable	0
12	Palustrine Wetlands	-	-	-	No	No	0
13	Lacustrine Wetlands	-	-	-	No	No	0
	Potential Natural Grassland	RE 11.8.11	Of Concern	Endangered	Yes	Yes	149.43
Total Areas							152.19

* This community was considered to be equivalent with RE 11.4.9 in terms of species composition but did not satisfy all requirements that define remnant vegetation (i.e. >70% of the height and/or >50% of the cover relative to the undisturbed height and cover of a given RE). Brigalow is neither dominant nor co-dominant; the community is therefore not considered Endangered under the EPBC Act. Source: AARC 2013

8.3.1 General Management Strategies

The following general management strategies are appropriate for the Project site:

- Vegetation clearing on the Project site should be minimised such that only those areas required for the operation of the Project are disturbed;
- Native vegetation removal should be conducted only after:
 - The areas to be cleared have been clearly delineated and identified to equipment operators and supervisors;
 - Weed control measures such as vehicle wash downs have been implemented to prevent the spread of weed species along riparian corridors;
 - Appropriate erosion and sediment-control structures are in place; and
 - Clearance from environmental staff has been obtained.
- It is recommended that the following procedures are implemented during the clearing of hollow-bearing trees:
 - Use the biggest bulldozer available – tap the trunk with the blade a few times to wake up anything inside the tree, wait a few minutes and watch for anything to come out;
 - Push the tree slowly from the side with the hollow – the hollow needs to be upwards, not crushed on the ground – with the base of the blade about one metre up to get leverage; and
 - As the tree starts to lean, lower the blade to the ground to catch the base/roots portion, and then lower the tree slowly by raising the blade.
 - Salvage any good hollows for placement off site – wire them to other trees, pointing at the same compass aspect; and
 - Relocate branches/roost trees to a non-impacted area in the immediate neighbourhood. Where relocation of whole trees is not feasible, the extent of the tree hollow can be estimated and that section can be chain-sawed out and fastened to nearby trees in a non-impacted area.
- Suitable sediment and erosion control measures should be implemented to prevent sediment deposition in adjacent retained habitats. To ensure the availability of seed for mine rehabilitation works, it is recommended that retained areas of existing vegetation are protected and maintained throughout the Project;
- The selection of flora species to be used in rehabilitation works should be appropriate to the landscape elements of the Project site. Rehabilitation species should be selected from the lists provided in this report that show the dominant flora of each community;
- It is recommended that any landforms created as a result of the Project are contoured to resemble the original local topography (i.e. contoured as a flat to undulating plain);



- Project infrastructure planning and construction should avoid the creation of shallow, ponded areas including septic and other tank overflows that form a permanent seep. Ponded areas attract cane toads and facilitate their breeding;
- Habitat areas due to be impacted by the Project shall be inspected prior to any vegetation clearing to determine whether any fauna are present. Any fauna observed within an area to be disturbed should be given the opportunity to move on naturally before clearing occurs;
- Underground longwall mining will cause land subsidence with varied potential impacts on terrestrial ecosystem functioning. To mitigate these potential impacts a Subsidence Management Plan will need to be developed in accordance with the requirements of the DEHP guideline *Watercourse Subsidence – Central Queensland Mining Industry (DRAFT Version 7)*. Subsidence mitigation measures to be considered include the following:
 - While surface tilt will be unavoidable, the impacts on sensitive landscape features and surface drainage will require consideration and appropriate subsidence management strategies implemented. Subsidence-induced ponding will be mitigated by the completion of minor remedial drainage earthworks to re-establish free drainage. Minor remedial drainage works shall ensure that subsidence does not result in hydrological changes that would impact on the ecological functioning (including species composition or remnant status of vegetation communities) of impacted areas; and
 - Because surface cracking will only occur over a small portion of the subsided area, the exact locations of tension cracks will need to be confirmed through monitoring. Surface cracks will then be rehabilitated using remedial earthworks and the use of sealants if required. While tension cracking will not necessarily impact on vegetation communities, the rehabilitation of cracks may lead to impacts on vegetation. Consequently, the rehabilitation of cracks will be managed appropriately to avoid impacts on vegetation. A rehabilitation plan will be prepared to guide remediation works on tension cracks whilst minimising impacts on surrounding ecosystem values. The rehabilitation program will be designed to ensure that any vegetation communities disturbed during repairs to tension cracks are returned to pre-disturbance condition.
- The Staff Induction Program should incorporate a section on the conservation values on the Project site and surrounding areas to facilitate staff awareness. It is recommended that this section include photographs, brief descriptions and management requirements of any species of conservation significance known from the Project site or surrounding areas; and
- The rehabilitation strategy developed for the Project site should embody the concepts and recommendations presented above and include provision for monitoring of rehabilitation progress over the life of the operation. Areas should be rehabilitated (or at least stabilised) in stages as soon as possible after disturbance to minimise the risk of soil erosion. Rehabilitation should aim to restore the impacted vegetation communities and revegetate with local native species, to achieve similar pre-disturbance condition with the objective of maintaining RE status.

8.3.2 Management of Species of Conservation Significance

One species of conservation significance – the Little Pied Bat – is known to occur on the Project site. This species is listed as Near Threatened under the NC Act. The Little Pied Bat is known to occupy woodlands where they forage for insects among the canopy. They roost primarily in tree hollows and occasionally in caves. There is evidence to suggest that the species will use stags as preferential



roost trees. Therefore, specific attention should be paid to the timing and management of vegetation clearing. In particular, roost trees and dead stag trees should be preserved either in their entirety or in part, and if possible the population should be monitored prior to vegetation clearance and prior to the breeding season during any planned blasting activities.

Little Pied Bats, as well as other threatened bat species, are thought to have been negatively impacted by habitat loss and habitat fragmentation. Disturbance to roost sites via vegetation clearing also has the potential to affect a range of threatened bat species. The Action Plan for Australian Bats suggests that both processes have the potential to impact upon the Little Pied Bat (Duncan *et al.* 1999).

A range of bat specific mitigations measures aimed at minimising the impacts to the Little Pied Bat habitat, as well as other bats species, are outlined below:

- Fauna spotters should conduct a thorough survey of the site prior to any vegetation clearing;
- Vegetation clearing should be staggered and follow a protocol specific to bats as recommended by Greg Richards from the Australasian Bat Society as follows:
 1. Survey all trees and flag those with potential roost hollows;
 2. Clear all non-hollow trees (non-flagged trees) – this disturbs any bats in colonies due to the habitat disturbance. Leave trees flagged as having hollows;
 3. Wait for a period of 2-3 days. From pre-dusk to an hour afterwards, fauna spotters qualified in bat relocations should be employed to detect the presence of Little Pied Bats at remaining trees using AnaBats pointing towards hollows – identify colonies by the rapid bursts of calls (1 – 2 seconds or so apart, often in batches of up to 5 at a time – i.e. they won't all disperse in one rush in case a predator is present);
 4. Flag trees with Little Pied Bats present in hollows;
 5. Clear trees free of bats in the following manner:
 - a. Use the biggest bulldozer available – it needs to take the weight of a tree – tap the trunk with the blade a few times to wake up anything inside the tree, wait a few minutes and watch for anything to come out
 - b. Push the tree slowly from the side with the hollow – the hollow needs to be upwards, not crushed on the ground – with the base of the blade about one metre up to get leverage
 - c. As the tree starts to lean, lower the blade to the ground to catch the base / roots portion, and then lower the tree slowly by raising the blade.
 6. Salvage any good hollows for placement off site – wire them to other trees, pointing at the same compass aspect;
 7. Wait a further 2 - 3 days – all that should be left are trees with Little Pied Bats in them;



8. Monitor again with AnaBats as above, clear remaining trees as described above; and
 9. Relocate branches / roost trees that housed Little Pied Bats to a non-impacted area in the immediate vicinity of the disturbance area. Where relocation of whole trees is not feasible, the extent of the tree hollow can be estimated and that section can be chain sawed out and fastened to nearby trees in a non-impacted area. Artificial nest boxes can also be installed within the non-impacted area.
- Undertake a monitoring program to assess the presence of the Little Pied Bat in areas adjacent to the proposed blasting areas;
 - A range of blasting regimes / methods should be employed that take into consideration the location of Little Pied Bat roost sites and aim to direct the blast / vibration front away from the roost location;
 - Where possible, consider using earthen banks and / or noise barriers to baffle blasting; and
 - Where possible, consider using plant machinery (scraper, D10 bulldozer etc.) instead of blasting.

8.4 MANAGEMENT OF PEST FLORA AND FAUNA

8.4.1 Weed Management Strategies

Weeds pose a significant threat to Australia's natural ecosystems. Extensive invasions can change the floristic structure of vegetation and upset the ecological balance in affected communities as they compete for space and resources with native species. Controlling declared pests and protecting ecosystems from 'threatening processes' such as the invasion of noxious weeds is a legal obligation. Prevention and early detection of weed outbreaks are the most cost effective strategies for dealing with weeds, as eradication of large infestations can be difficult and often requires greater resources.

Mined lands are prone to weed invasion, particularly where soils have been disturbed, along transport routes and surrounding infrastructure areas. The risks posed by weeds in mining areas include the introduction of new species, the spread of weeds to adjacent areas and increases in weed abundance in disturbed areas. Weeds can also diminish rehabilitation efforts by outcompeting species selected for revegetation and reduce overall land productivity.

The LP Act describes three classes of declared pests as follows:

Class 1 pests are those that are not commonly present in Queensland, and if introduced, would cause an adverse economic, environmental, or social impact. Class 1 pests established in Queensland are subject to eradication from the state.

Class 2 pests are those that are established in Queensland and have, or could have, an adverse economic, environmental, or social impact. The management of these pests requires coordination and they are subject to programs led by local government, community or landowners. Landowners must take reasonable steps to keep land free of Class 2 pests.

Class 3 pests are established in Queensland and have, or could have, an adverse economic, environmental or social impact. Landholders are not required to control Class 3 plants unless there is



potential for them to spread into nearby environmentally significant areas such as national parks. Class 3 plants warrant listing primarily as a means of preventing their sale and spread into new areas.

A total of three, Class 2 and one Class 3 pest plants have been recorded on the Project site, as presented in Table 21. All four declared weeds are also listed as WONS.

Table 21 Declared Plants Recorded on the Project Site

Species Name	Common Name	WONS	Status under the LP Act
<i>Parthenium hysterophorus</i>	Parthenium Weed	WONS	Class 2
<i>Senecio madagascariensis</i>	Fireweed	WONS	Class 2
<i>Parkinsonia aculeata</i>	Parkinsonia	WONS	Class 2
<i>Lantana camara</i>	Lantana	WONS	Class 3

Source: LP Act 2002

As it is an offence to move or transport a vehicle on a road if it is known, or should be known, that it is contaminated with a declared plant, measures to control the spread of these weeds should be adopted across the Project.

A Weed Management Plan (WMP) may prevent the spread of weeds throughout the site, thereby reducing the liability costs associated with the eradication of infestations. Consequently, it is recommended that a WMP be developed for the Project site.

Cost effective and simple control measures should include:

- Restricting vehicles to designated roads where practical;
- Preventing water and fertilisers (when used) from running into bushland;
- Managing buffers or windbreaks around disused revegetated areas (when applicable); and
- Cleaning machinery and off-road vehicles (including visitors).

Biosecurity Queensland promotes a number of wash-down procedures, enabling industry to meet these requirements.

Pest Fact Sheets (prepared by DAFF) of the weed species which were identified within the Project site detail the most effective methods of eradication. These Pest Fact Sheets should be consulted (refer to Appendix G for details) when developing weed eradication / management strategies.

To promote the awareness of weed management issues, it is recommended that weed management is included in the Site Induction Program for the Project. Through this process, staff should be informed of the weed species likely to be encountered on the Project site, the locations of known weed infestations and how to report the presence of new infestations.



8.4.2 Pest Animal Species

Six introduced pest fauna species were recorded during the field surveys (refer to Table 22 for details) four of which are defined as Class 2 Pests under the Queensland LP Act:

Table 22 Pest Animal Species Recorded During Field Surveys

LP Act Status	Common Name	Scientific Name
Class 2	Dingo	<i>Canis lupus dingo</i>
Class 2	Feral Cat	<i>Felis catus</i>
Class 2	European Rabbit	<i>Oryctolagus cuniculus</i>
Class 2	Feral Pig	<i>Sus scrofa</i>
Not Declared	House Mouse	<i>Mus musculus</i>
Not Declared	Cane Toad	<i>Bufo marinus</i>

Source: LP Act 2002

Under the LP Act, land managers must take reasonable steps to control numbers of Class 2 Pests on their land.

Dingo (*Canis lupus dingo*)

The Dingo occurs throughout Australia and occupies a diverse range of habitats from rainforests to the Nullarbor Plain. Dingoes can carry canine parasites and diseases such as distemper and parvovirus. They are the largest mammalian carnivore remaining in mainland Australia and are a known predator of domestic stock.

This species is listed as a Class 2 pest under the LP Act. Control methods include baiting, shooting, trapping, fencing and livestock guardian dogs.

Feral Cat (*Felis catus*)

The Feral Cat is widespread throughout Australia and thrives in all climatic extremes and across vastly different terrains. Feral Cats prey on native Australian fauna and compete with native predatory species such as quolls, eagles, hawks and reptiles. The pressure caused by increased competition for prey can lead to a decline in the numbers of native predator species. Native animals also suffer from the effects of toxoplasmosis, a disease that reproduces only in the intestine of the Cat.

Feral Cats are listed as Class 2 pests under LP Act. Recommended methods for the control of this pest species include night shooting, poisoning, trapping and fencing.

Feral Pig (*Sus scrofa*)

The Feral Pig is one of the most widespread and damaging pest animals in Queensland. They favour environments with permanent water bodies and have the potential to cause widespread ecological damage by spreading weeds and disease and degrading riparian areas.



They are listed as Class 2 pests under LP Act. Feral Pigs were observed within crops and in watercourses on the Project site. Methods for the control of this species include shooting, trapping, fencing and poisoning and should be implemented in combination.

European Rabbit (*Oryctolagus cuniculus*)

Rabbits are widely distributed throughout Australia and occur across a diverse variety of habitats. European Rabbits are a major agricultural and environmental pest in Australia. Competition and land degradation by Rabbits is listed as a key threatening process under Commonwealth legislation. Rabbits directly compete with native wildlife for food and shelter and can impact on native plants by ringbarking, grazing and browsing, and preventing regeneration of seedlings. Their digging and browsing leads to a loss of vegetation cover, which in turn can result in slope instability, soil erosion and the silting up of aquatic ecosystems.

Favourable habitat conditions and food availability are likely reasons behind their prevalence throughout the Project site, where they were observed in abundance.

European Rabbits are listed as a Class 2 Pest under Queensland's LP Act. Suitable control methods may include baiting, rabbit-proof fencing, fumigation, trapping, shooting and the destruction of rabbit warrens through ripping, ploughing and blasting.

House Mouse (*Mus musculus*)

House mice are introduced pests that are now distributed throughout Australia. They are often found in areas of long grass, crops, sheds and houses. During favourable conditions their numbers can rapidly increase to plague proportions, where they can cause serious damage to crops and houses.

The House Mouse is not listed under the LP Act as a declared pest species. There is no legal requirement to control pest animals that are not declared under Queensland legislation.

Cane Toad (*Rhinella marina*)

Cane Toads were introduced into Australia in 1935 and have expanded their territory ever since. They produce highly toxic venom capable of killing most domestic and native animals if ingested. Cane Toads eat a wide variety of insects and frogs as well as small reptiles and mammals.

The Cane Toad is not listed under the LP Act as a declared pest species.

While there is no legal requirement to control non-declared pest animals, it is recommended that activities within the Project site should not facilitate any increase in the population numbers of non-declared animals (i.e. Cane Toad and House Mouse).

Fact sheets outlining the ecology and control methods of the species described above are attached in Appendix G. It is recommended that a pest management plan be developed to control pest fauna on the Project site.



9.0 REFERENCES

- Australian Natural Resources Atlas (ANRA) (2009). *Rangelands-Vegetation*, Australian Government, www.anra.gov.au.
- Brock, J. (2005). *Native Plants of Northern Australia*, New Holland Publishing, Australia.
- Brooker, M.I.H. and Kleinig, D.A. (2004). *Eucalypts, Volume 3, Northern Australia*, Bloomings Books, Melbourne.
- Churchill, S. (2008). *Australian Bats*. Allen & Unwin; Sydney.
- Cogger, H.G. (2000). *Reptiles and Amphibians of Australia*. Reed New Holland, Sydney.
- Couper, P.J. & G.J. Ingram (1992). *A new species of skink of Lerista from Queensland and a re-appraisal of L. allanae (Longman)*. *Memoirs of the Queensland Museum*. 32 (1):55-59.
- Contant, C.K. & Wiggins, L.L. (1991). 'Defining and analyzing cumulative environmental impacts', *Environmental Impact Assessment Review*, vol. 11, pp. 297-309.
- Council on Environmental Quality (1978). *CEQ – Regulations for Implementing National Environmental Policy Act (NEPA) – Sec. 1508.7 Cumulative impact*, Council on Environmental Quality (United States of America), Washington DC.
- Department of Employment, Economic Development and Innovation (2007). *Pest Fact Sheet: Feral Goat*.
- Department of Environment and Conservation (DEC) (2004). *Threatened Species Survey and Assessment: Guidelines for developments and activities* (working draft), New South Wales Department of Environment and Conservation, Hurstville, NSW.
- Department of the Environment and Conservation (DEC) (2009). *Threatened Species, Populations and Ecological Communities*, New South Wales Department of Environment and Conservation, Hurstville, NSW
- Department of the Environment and Conservation (DEC) (2009). *Threatened Species, Populations and Ecological Communities, the Squatter Pigeon*, New South Wales Department of Environment and Conservation, Hurstville, NSW
- Department of Environment and Heritage Protection (DEHP) (2012). *WildNet (Database)*, Department of Environment and Resource Management, Brisbane. Accessed 2nd April 2012.
- Department of the Environment, Water, Heritage and the Arts (1999). *The Action Plan for Australian Bats – Recovery Outlines: Troughton's Sheath-tail Bat*, Department of the Environment, Water, Heritage and the Arts, Canberra.
- Department of Sustainability, Environment, Water, Population and Communities (2009). *Digitaria porrecta* in *Species Profile and Threats Database*, Department of Sustainability, Environment, Water, Population and Communities, Canberra.

Department of Sustainability, Environment, Water, Population and Communities (2009). *Dichanthium queenslandicum* in *Species Profile and Threats Database*, Department of Sustainability, Environment, Water, Population and Communities, Canberra.

Department of Sustainability, Environment, Water, Population and Communities (2012). *Aristida annua* in *Species Profile and Threats Database*, Department of Sustainability, Environment, Water, Population and Communities, Canberra. Accessed Tue, 14 Aug 2012 <<http://www.environment.gov.au/sprat>>

Department of Sustainability, Environment, Water, Population and Communities (2009). *Dichanthium setosum* in *Species Profile and Threats Database*, Department of Sustainability, Environment, Water, Population and Communities, Canberra.

Freeman, A. (2009). *Recommended Fauna Survey Methodology for Environmental Impact Assessments*, Department of Environment and Heritage protection, Atherton, Qld.

Garnett, S.T., Szabo, J.K. & Dutson, G. (2011). *The Action Plan for Australian Birds 2010*, CSIRO Publishing, Collingwood, Victoria.

Lokkers, Con, Calvert, Gregor Alan, and Cumming, Russell (2005). *Rare and Threatened Plants of the Townsville – Thuringowa Region*, Coastal Dry Tropics Landcare Inc, Townsville.

Marchant, S. & Higgins, P. J. (Eds) (1993). *Handbook of Australian, New Zealand and Antarctic Birds*, Volume 2: Raptors to Lapwings, Oxford University Press, Melbourne.

Maslin, B.R. (2001). *Wattle: Acacias of Australia*, Australian Biological Resources Study, Canberra and Department of Conservation and Land Management, Perth.

McIntyre, S. & Hobbs, R. J. (1999). 'A framework for conceptualizing human impacts on landscapes and its relevance to management and research models', *Conservation Biology* 13, 1282-92.

Menkhorst, P. & Knight, F. (2004). *A Field Guide to the Mammals of Australia*, Oxford University Press.

Morcombe, M. (2002). *Field Guide to Australian Birds*, Steve Parish Publishing, Pty, Ltd.

Neldner, V.J., Wilson, B. A., Thompson, E.J. & Dillewaard, H.A. (2005). *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland*. Version 3.1. Updated September 2005. Queensland Herbarium, Environmental Protection Agency, Brisbane.

North Australian Land Manager. *Checklist of Plants Significant for Conservation of Queensland*, Australian Government, www.landmanager.org.au.

Palm and Cycad Societies of Australia (PASCOA) (2009). <http://www.pascoa.org.au/>.

Pianka, E. R. (1969a). 'Habitat Specificity, speciation and species density in Australian desert lizards', *Ecology*, 50: 498-502.

Pianka, E. R. (1969b). 'Sympatry of Desert Lizards (Ctenotus) in Western Australia', *Ecology*, 50: 1012-1030.



Pizzey, G. & Knight, F. (1997). *The Field Guide to the Birds of Australia*, HarperCollins Publishers, Pty, Ltd.

Queensland Herbarium (2011). Regional Ecosystem Description Database (REDD). Version 6.0b – January 2011, (January 2011), Department of Environment and Heritage Protection, Brisbane.

Reardon, T. & Thomson, B. (2002). *Taxonomic and conservation status of Taphozous troughtoni*. Poster abstract, Proceedings of the 10th Australasian Bat Conference, Cairns, April 2002. Australasian Bat Society Newsletter **18**, 29.

Russell, E. M. (1974). 'Recent ecological studies on Australian marsupials', *Australian Mammology* **1**:189-211.

Sattler, P. & Williams, R. eds. (1999). *The Conservation Status of Queensland's Bioregional Ecosystems*. Queensland Environmental Protection Agency. Brisbane.

Sharp, D. & Simon, B.K. (2002). *Ausgrass: Grasses of Australia*, Australian Biological Resources Study, Canberra and Environmental Protection Agency, Brisbane.

Shine, R. (1983). Food habits and reproductive biology of the Australian elapid snakes of the genus *Denisonia*. *Journal of Herpetology*. **17** (2):171-175.

Simon, B.K. & Alfonso, Y. (2011). *Dichanthium queenslandicum*, AusGrass2. Accessed on 17 August 2012 <<http://ausgrass2.myspecies.info/>>.

Simpson, K. & Day, N. (2010). *Field Guide to the Birds of Australia*. Penguin Group (Australia), Camberwell, Victoria.

Smith, P.J. (1992). A revision of the genus *Wahlenbergia* (Campanulaceae) in Australia. *Telopea* **5**(1): 114-116, Figs 10, 25 [tax. nov.]

Smith, A.P. & Lindenmayer, D. (1988). 'Tree Hollow Requirements of Leadbeaters Possum and Other Possums and Gliders in Timber Production Ash Forests of the Victorian Central Highlands', *Australian Wildlife Research*. **15**:347-362.

Tyler, M. & Knight, F. (2009). *Field Guide to Frogs of Australia*. CSIRO Publishing, Collingswood, Victoria.

Wilson, S. (2005). *A Field Guide to Reptiles of Queensland*, New Holland Publishers (Australia) Pty Ltd.

Wilson, S. (2009). *A Field Guide to Reptiles of Queensland*, New Holland Publishers (Australia) Pty Ltd.

Wilson, K.L. (2012) *Cyperus clarus*, in *PlantNet: New South Wales Flora Online*. National Herbarium of New South Wales. Accessed 14/08/2012. <<http://plantnet.rbgsyd.nsw.gov.au/>>

Wilson, S.K. & Knowles, D.G. (1988) *Australia's Reptiles. A Photographic Reference to the Terrestrial Reptiles of Australia*, Collins Publishers Australia, Sydney.

Wilson, S.K. & Swan, G. (2008) *A complete guide to reptiles of Australia*, New Holland Publishers, Sydney.



Withers, P.C. (1995). 'Cocoon formation and structure in the aestivating Australian desert frogs, *Neobatrachus* and *Cyclorana*', *Australian Journal of Zoology*. 43: 429-441.

Appendix A Threatened Species Database Searches





Australian Government

Department of Sustainability, Environment,
Water, Population and Communities

EPBC Act Protected Matters Report: Coordinates

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

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

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

Report created: 29/09/11 09:09:57

[Summary](#)

[Details](#)

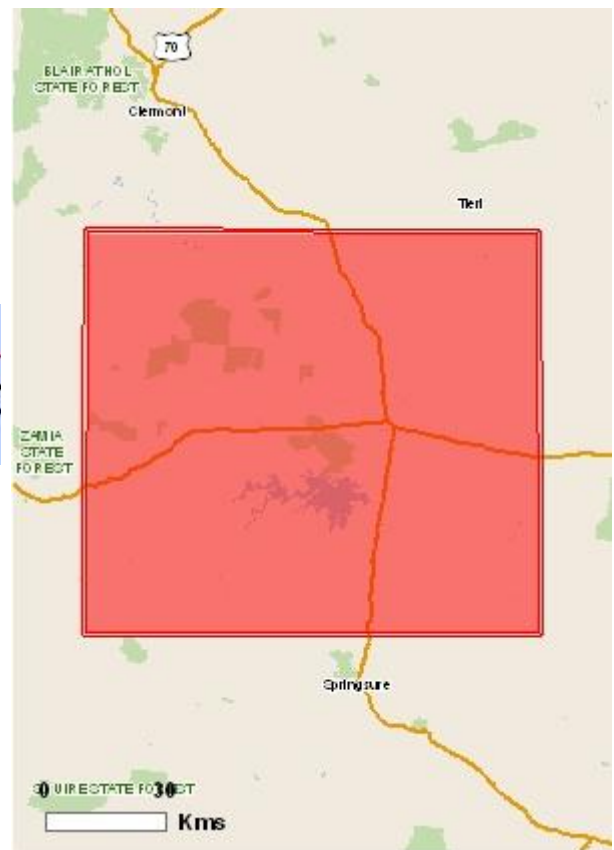
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



This map may contain data which are
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[Coordinates](#)

Buffer: 1.0Km

Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Significance (Ramsar Wetlands):	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Threatened Ecological Communities:	5
Threatened Species:	18
Migratory Species:	12

Other Matters Protected by the EPBC Act

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

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

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

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

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	11
Whales and Other Cetaceans:	None

Critical Habitats:	None
Commonwealth Reserves:	None

Report Summary for Extra Information

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

Place on the RNE:	3
State and Territory Reserves:	9
Regional Forest Agreements:	None
Invasive Species:	12
Nationally Important Wetlands:	1

Details

Matters of National Environmental Significance

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

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

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

Threatened Species [[Resource Information](#)]

Name	Status	Type of Presence
BIRDS		
Erythroriorchis radiatus		
Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Geophaps scripta scripta		
Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat likely to occur within area
Neochmia ruficauda ruficauda		
Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area

[Rostratula australis](#)Australian Painted Snipe
[77037]

Vulnerable

Species or species habitat may occur within area

MAMMALS[Dasyurus hallucatus](#)

Northern Quoll [331]

Endangered

Species or species habitat likely to occur within area

[Nyctophilus timoriensis \(South-eastern form\)](#)Greater Long-eared Bat,
South-eastern Long-eared Bat
[66888]

Vulnerable

Species or species habitat may occur within area

PLANTS[Aristida annua](#)

[17906]

Vulnerable

Species or species habitat likely to occur within area

[Cadellia pentastylis](#)

Ooline [9828]

Vulnerable

Species or species habitat likely to occur within area

[Dichanthium queenslandicum](#)

King Blue-grass [5481]

Vulnerable

Species or species habitat likely to occur within area

[Digitaria porrecta](#)

Finger Panic Grass [12768]

Endangered

Species or species habitat likely to occur within area

[Marsdenia brevifolia](#)

[64585]

Vulnerable

Species or species habitat likely to occur within area

REPTILES[Delma torquata](#)

Collared Delma [1656]

Vulnerable

Species or species habitat may occur within area

[Denisonia maculata](#)

Ornamental Snake [1193]

Vulnerable

Species or species habitat known to occur within area

[Egernia rugosa](#)

Yakka Skink [1420]

Vulnerable

Species or species habitat known to occur within area

[Furina dunmali](#)

Dunmall's Snake [59254]

Vulnerable

Species or species habitat may occur within area

[Lerista allanae](#)Allan's Lerista, Retro Slider
[1378]

Endangered

Species or species habitat likely to occur within area

[Paradelma orientalis](#)

Brigalow Scaly-foot [59134]

Vulnerable

Species or species habitat likely to occur within area

[Rheodytes leukops](#)Fitzroy River Turtle, Fitzroy
Tortoise, Fitzroy Turtle [1761]

Vulnerable

Species or species habitat may occur within area

Migratory Species**[Resource Information]**

Name

Status

Type of Presence

Migratory Marine Birds[Apus pacificus](#)

Fork-tailed Swift [678]

Species or species habitat may occur within area

[Ardea alba](#)Great Egret, White Egret
[59541]

Species or species habitat may occur within area

[Ardea ibis](#)

Cattle Egret [59542]

Species or species habitat may occur within area

Migratory Terrestrial Species[Haliaeetus leucogaster](#)

White-bellied Sea-Eagle [943]

Species or species habitat likely to occur within area

[Hirundapus caudacutus](#)

White-throated Needletail [682]

Species or species habitat may occur within area

[Merops ornatus](#)

Rainbow Bee-eater [670]

Species or species habitat may occur within area

[Myiagra cyanoleuca](#)

Satin Flycatcher [612]

Species or species habitat likely to occur within area

Migratory Wetlands Species[Ardea alba](#)Great Egret, White Egret
[59541]

Species or species habitat may occur within area

[Ardea ibis](#)

Cattle Egret [59542]

Species or species habitat may occur within area

[Gallinago hardwickii](#)Latham's Snipe, Japanese Snipe
[863]

Species or species habitat may occur within area

[Nettapus coromandelianus albipennis](#)Australian Cotton Pygmy-goose
[25979]

Species or species habitat may occur within area

[Rostratula benghalensis s. lat.](#)

Painted Snipe [889]

Vulnerable*

Species or species habitat may occur within area

Other Matters Protected by the EPBC Act**Listed Marine Species****[Resource Information]****Name****Status****Type of Presence****Birds**[Anseranas semipalmata](#)

Magpie Goose [978]

Species or species habitat may occur within area

[Apus pacificus](#)

Fork-tailed Swift [678]

Species or species habitat may occur within area

[Ardea alba](#)Great Egret, White Egret
[59541]

Species or species habitat may occur within area

[Ardea ibis](#)

Cattle Egret [59542]

Species or species habitat may occur within area

[Gallinago hardwickii](#)Latham's Snipe, Japanese Snipe
[863]

Species or species habitat may occur within area

[Haliaeetus leucogaster](#)

White-bellied Sea-Eagle [943]

Species or species habitat likely to occur within area

[Hirundapus caudacutus](#)

White-throated Needletail [682]

Species or species habitat may occur within area

[Merops ornatus](#)

Rainbow Bee-eater [670]

Species or species habitat may occur within area

[Myiagra cyanoleuca](#)

Satin Flycatcher [612]

Species or species habitat likely to occur within area

[Nettapus coromandelianus albipennis](#)Australian Cotton Pygmy-goose
[25979]

Species or species habitat may occur within area

[Rostratula benghalensis s. lat.](#)

Painted Snipe [889]

Vulnerable*

Species or species habitat may occur within area

Extra Information**Places on the RNE****[Resource Information]**

Note that not all Indigenous sites may be listed.

Name**Status****Natural**[Minerva Hills QLD](#)

Indicative Place

Indigenous[Wills Massacre Site QLD](#)

Indicative Place

Historic[Emerald Railway Station QLD](#)

Registered

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

Caroa Island Paddock, QLD

Henellen, QLD

Snake Range, QLD

Southernwood, QLD

Ramboda, QLD

Goonderoo, QLD

Mount Leura, QLD

Avocet, QLD

Rifle Range, QLD

Invasive Species**[Resource Information]**

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

Name**Status****Type of Presence****Frogs**[Bufo marinus](#)

Cane Toad [1772]

Species or species habitat likely to occur within area

Mammals[Felis catus](#)Cat, House Cat, Domestic Cat
[19]

Species or species habitat likely to occur within area

[Oryctolagus cuniculus](#)

Rabbit, European Rabbit [128]

Species or species habitat likely to occur within area

[Sus scrofa](#)

Pig [6]	Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]	Species or species habitat likely to occur within area

Plants

Acacia nilotica subsp. indica Prickly Acacia [6196]	Species or species habitat may occur within area
Cryptostegia grandiflora Rubber Vine, Rubbervine, India Rubber Vine, India Rubbervine, Palay Rubbervine, Purple Allamanda [18913]	Species or species habitat likely to occur within area
Hymenachne amplexicaulis Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754]	Species or species habitat likely to occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]	Species or species habitat likely to occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]	Species or species habitat likely to occur within area
Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]	Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]	Species or species habitat likely to occur within area

Nationally Important Wetlands

[Resource Information]

[Fairbairn Dam, QLD](#)

Caveat

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

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

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a

general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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

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

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

- migratory and
- marine

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

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

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

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

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

Coordinates

-23.0953 147.4799,-23.10104 148.4933,-23.99733 148.4992,-23.99781 147.4747,-23.0953 147.4799

Acknowledgements

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- [-Department of Environment, Climate Change and Water, New South Wales](#)
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- [-Australian Government, Department of Defence](#)
- [-State Forests of NSW](#)
- Other groups and individuals

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Wildlife Online Extract

Search Criteria: Species List for a Defined Area
Species: All
Type: All
Status: All
Records: All
Date: All
Latitude: 23.0953 to 23.5353
Longitude: 148.4992 to 147.9356
Email: hdick@aacrc.net.au
Date submitted: Monday 28 May 2012 16:04:51
Date extracted: Monday 28 May 2012 16:10:29

The number of records retrieved = 564

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Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Bufonidae	<i>Rhinella marina</i>	cane toad	Y			9
animals	amphibians	Hylidae	<i>Litoria inermis</i>	bumpy rocketfrog		C		6/2
animals	amphibians	Hylidae	<i>Litoria peronii</i>	emerald spotted treefrog		C		3/1
animals	amphibians	Hylidae	<i>Litoria rubella</i>	ruddy treefrog		C		10/3
animals	amphibians	Hylidae	<i>Litoria caerulea</i>	common green treefrog		C		18/2
animals	amphibians	Hylidae	<i>Cyclorana brevipes</i>	superb collared frog		C		4
animals	amphibians	Hylidae	<i>Cyclorana cultripes</i>	grassland collared frog		C		2
animals	amphibians	Hylidae	<i>Cyclorana verrucosa</i>	rough collared frog		NT		3
animals	amphibians	Hylidae	<i>Litoria latopalmata</i>	broad palmed rocketfrog		C		6
animals	amphibians	Hylidae	<i>Cyclorana alboguttata</i>	greenstripe frog		C		12/3
animals	amphibians	Hylidae	<i>Cyclorana platycephala</i>	water holding frog		C		1
animals	amphibians	Hylidae	<i>Cyclorana novaehollandiae</i>	eastern snapping frog		C		11/3
animals	amphibians	Hylidae	<i>Litoria fallax</i>	eastern sedgefrog		C		3/2
animals	amphibians	Hylidae	<i>Litoria rothii</i>	northern laughing treefrog		C		3
animals	amphibians	Limnodynastidae	<i>Limnodynastes salmini</i>	salmon striped frog		C		11/3
animals	amphibians	Limnodynastidae	<i>Platyplectrum ornatum</i>	ornate burrowing frog		C		11
animals	amphibians	Limnodynastidae	<i>Limnodynastes tasmaniensis</i>	spotted grassfrog		C		11/2
animals	amphibians	Limnodynastidae	<i>Limnodynastes terraereginae</i>	scarlet sided pobblebonk		C		2
animals	amphibians	Myobatrachidae	<i>Uperoleia rugosa</i>	chubby gungan		C		1
animals	birds	Acanthizidae	<i>Acanthiza reguloides</i>	buff-rumped thornbill		C		1
animals	birds	Acanthizidae	<i>Acanthiza apicalis</i>	inland thornbill		C		5
animals	birds	Acanthizidae	<i>Acanthiza pusilla</i>	brown thornbill		C		1
animals	birds	Acanthizidae	<i>Gerygone fusca</i>	western gerygone		C		3
animals	birds	Acanthizidae	<i>Smicromis brevirostris</i>	weebill		C		34
animals	birds	Acanthizidae	<i>Gerygone albogularis</i>	white-throated gerygone		C		34
animals	birds	Acanthizidae	<i>Acanthiza chrysorrhoa</i>	yellow-rumped thornbill		C		13
animals	birds	Acanthizidae	<i>Chthonicola sagittata</i>	speckled warbler		C		4
animals	birds	Acanthizidae	<i>Acanthiza nana</i>	yellow thornbill		C		8
animals	birds	Accipitridae	<i>Accipiter cirrocephalus</i>	collared sparrowhawk		C		4
animals	birds	Accipitridae	<i>Accipiter novaehollandiae</i>	grey goshawk		NT		1
animals	birds	Accipitridae	<i>Erythroriorchis radiatus</i>	red goshawk		E	V	1
animals	birds	Accipitridae	<i>Hieraaetus morphnoides</i>	little eagle		C		2
animals	birds	Accipitridae	<i>Haliaeetus leucogaster</i>	white-bellied sea-eagle		C		7
animals	birds	Accipitridae	<i>Haliastur sphenurus</i>	whistling kite		C		61
animals	birds	Accipitridae	<i>Aviceda subcristata</i>	Pacific baza		C		3
animals	birds	Accipitridae	<i>Accipiter fasciatus</i>	brown goshawk		C		13
animals	birds	Accipitridae	<i>Circus approximans</i>	swamp harrier		C		5
animals	birds	Accipitridae	<i>Pandion cristatus</i>	eastern osprey		C		3
animals	birds	Accipitridae	<i>Milvus migrans</i>	black kite		C		77
animals	birds	Accipitridae	<i>Circus assimilis</i>	spotted harrier		C		5
animals	birds	Accipitridae	<i>Elanus axillaris</i>	black-shouldered kite		C		27
animals	birds	Accipitridae	<i>Aquila audax</i>	wedge-tailed eagle		C		14
animals	birds	Acrocephalidae	<i>Acrocephalus australis</i>	Australian reed-warbler		C		29
animals	birds	Aegothelidae	<i>Aegotheles cristatus</i>	Australian owl-nightjar		C		5
animals	birds	Alaudidae	<i>Mirafra javanica</i>	Horsfield's bushlark		C		8
animals	birds	Alcedinidae	<i>Ceyx azureus</i>	azure kingfisher		C		12

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Anatidae	<i>Anas castanea</i>	chestnut teal		C		1
animals	birds	Anatidae	<i>Anas gracilis</i>	grey teal		C		77
animals	birds	Anatidae	<i>Malacorhynchus membranaceus</i>	pink-eared duck		C		18
animals	birds	Anatidae	<i>Nettapus coromandelianus</i>	cotton pygmy-goose		NT		1
animals	birds	Anatidae	<i>Dendrocygna arcuata</i>	wandering whistling-duck		C		10
animals	birds	Anatidae	<i>Dendrocygna eytoni</i>	plumed whistling-duck		C		31
animals	birds	Anatidae	<i>Chenonetta jubata</i>	Australian wood duck		C		46
animals	birds	Anatidae	<i>Anas superciliosa</i>	Pacific black duck		C		111
animals	birds	Anatidae	<i>Aythya australis</i>	hardhead		C		74
animals	birds	Anatidae	<i>Anas rhynchotis</i>	Australasian shoveler		C		15
animals	birds	Anatidae	<i>Cygnus atratus</i>	black swan		C		39
animals	birds	Anhingidae	<i>Anhinga novaehollandiae</i>	Australasian darter		C		59
animals	birds	Anseranatidae	<i>Anseranas semipalmata</i>	magpie goose		C		7
animals	birds	Apodidae	<i>Apus pacificus</i>	fork-tailed swift		C		1
animals	birds	Ardeidae	<i>Egretta garzetta</i>	little egret		C		17
animals	birds	Ardeidae	<i>Ardea pacifica</i>	white-necked heron		C		52
animals	birds	Ardeidae	<i>Ardea modesta</i>	eastern great egret		C		18
animals	birds	Ardeidae	<i>Ixobrychus flavicollis</i>	black bittern		C		6
animals	birds	Ardeidae	<i>Nycticorax caledonicus</i>	Nankeen night-heron		C		6
animals	birds	Ardeidae	<i>Egretta novaehollandiae</i>	white-faced heron		C		67
animals	birds	Ardeidae	<i>Ardea intermedia</i>	intermediate egret		C		76
animals	birds	Artamidae	<i>Artamus minor</i>	little woodswallow		C		1
animals	birds	Artamidae	<i>Artamus cinereus</i>	black-faced woodswallow		C		10
animals	birds	Artamidae	<i>Cracticus tibicen</i>	Australian magpie		C		94
animals	birds	Artamidae	<i>Artamus personatus</i>	masked woodswallow		C		1
animals	birds	Artamidae	<i>Strepera graculina</i>	pied currawong		C		5
animals	birds	Artamidae	<i>Artamus cyanopterus</i>	dusky woodswallow		C		1
animals	birds	Artamidae	<i>Cracticus torquatus</i>	grey butcherbird		C		43
animals	birds	Artamidae	<i>Artamus leucorhynchus</i>	white-breasted woodswallow		C		35
animals	birds	Artamidae	<i>Cracticus nigrogularis</i>	pied butcherbird		C		75
animals	birds	Burhinidae	<i>Burhinus grallarius</i>	bush stone-curlew		C		4
animals	birds	Cacatuidae	<i>Cacatua galerita</i>	sulphur-crested cockatoo		C		97
animals	birds	Cacatuidae	<i>Cacatua sanguinea</i>	little corella		C		2
animals	birds	Cacatuidae	<i>Nymphicus hollandicus</i>	cockatiel		C		56
animals	birds	Cacatuidae	<i>Eolophus roseicapillus</i>	galah		C		32
animals	birds	Campephagidae	<i>Coracina maxima</i>	ground cuckoo-shrike		C		11
animals	birds	Campephagidae	<i>Coracina papuensis</i>	white-bellied cuckoo-shrike		C		7
animals	birds	Campephagidae	<i>Coracina novaehollandiae</i>	black-faced cuckoo-shrike		C		61
animals	birds	Campephagidae	<i>Lalage leucomela</i>	varied triller		C		1
animals	birds	Campephagidae	<i>Lalage sueurii</i>	white-winged triller		C		12
animals	birds	Casuariidae	<i>Dromaius novaehollandiae</i>	emu		C		10
animals	birds	Charadriidae	<i>Vanellus miles novaehollandiae</i>	masked lapwing (southern subspecies)		C		5
animals	birds	Charadriidae	<i>Vanellus miles miles</i>	masked lapwing (northern subspecies)		C		1
animals	birds	Charadriidae	<i>Erythronyx cinctus</i>	red-kneed dotterel		C		4
animals	birds	Charadriidae	<i>Elseyornis melanops</i>	black-fronted dotterel		C		41
animals	birds	Charadriidae	<i>Vanellus miles</i>	masked lapwing		C		46

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Charadriidae	<i>Vanellus tricolor</i>	banded lapwing		C		4
animals	birds	Ciconiidae	<i>Ephippiorhynchus asiaticus</i>	black-necked stork		NT		3
animals	birds	Cisticolidae	<i>Cisticola exilis</i>	golden-headed cisticola		C		34
animals	birds	Climacteridae	<i>Cormobates leucophaea metastasis</i>	white-throated treecreeper (southern)		C		1
animals	birds	Columbidae	<i>Ocyphaps lophotes</i>	crested pigeon		C		76
animals	birds	Columbidae	<i>Phaps chalcoptera</i>	common bronzewing		C		10
animals	birds	Columbidae	<i>Geopelia humeralis</i>	bar-shouldered dove		C		53
animals	birds	Columbidae	<i>Geophaps scripta scripta</i>	squatter pigeon (southern subspecies)		V	V	1
animals	birds	Columbidae	<i>Geophaps scripta</i>	squatter pigeon		C		1
animals	birds	Columbidae	<i>Geopelia striata</i>	peaceful dove		C		49
animals	birds	Columbidae	<i>Geopelia cuneata</i>	diamond dove		C		4
animals	birds	Columbidae	<i>Columba livia</i>	rock dove	Y			7
animals	birds	Coraciidae	<i>Eurystomus orientalis</i>	dollarbird		C		24
animals	birds	Corcoracidae	<i>Struthidea cinerea</i>	apostlebird		C		33/1
animals	birds	Corvidae	<i>Corvus coronoides</i>	Australian raven		C		37
animals	birds	Corvidae	<i>Corvus orru</i>	Torresian crow		C		36
animals	birds	Corvidae	<i>Corvus sp.</i>					69
animals	birds	Cuculidae	<i>Scythrops novaehollandiae</i>	channel-billed cuckoo		C		22
animals	birds	Cuculidae	<i>Chalcites minutillus minutillus</i>	little bronze-cuckoo		C		3
animals	birds	Cuculidae	<i>Cacomantis flabelliformis</i>	fan-tailed cuckoo		C		3
animals	birds	Cuculidae	<i>Centropus phasianinus</i>	pheasant coucal		C		22/1
animals	birds	Cuculidae	<i>Eudynamys orientalis</i>	eastern koel		C		10
animals	birds	Cuculidae	<i>Cacomantis pallidus</i>	pallid cuckoo		C		5
animals	birds	Cuculidae	<i>Chalcites basalis</i>	Horsfield's bronze-cuckoo		C		8/2
animals	birds	Cuculidae	<i>Cacomantis variolosus</i>	brush cuckoo		C		1
animals	birds	Dicruridae	<i>Dicrurus bracteatus</i>	spangled drongo		C		5
animals	birds	Estrildidae	<i>Taeniopygia guttata</i>	zebra finch		C		18
animals	birds	Estrildidae	<i>Neochmia modesta</i>	plum-headed finch		C		3
animals	birds	Estrildidae	<i>Lonchura castaneothorax</i>	chestnut-breasted mannikin		C		28
animals	birds	Estrildidae	<i>Taeniopygia bichenovii</i>	double-barred finch		C		61
animals	birds	Eurostopodidae	<i>Eurostopodus mystacalis</i>	white-throated nightjar		C		1
animals	birds	Falconidae	<i>Falco berigora</i>	brown falcon		C		27
animals	birds	Falconidae	<i>Falco subniger</i>	black falcon		C		11
animals	birds	Falconidae	<i>Falco peregrinus</i>	peregrine falcon		C		3
animals	birds	Falconidae	<i>Falco cenchroides</i>	nankeen kestrel		C		53
animals	birds	Falconidae	<i>Falco longipennis</i>	Australian hobby		C		15
animals	birds	Glareolidae	<i>Stiltia isabella</i>	Australian pratincole		C		2
animals	birds	Gruidae	<i>Grus rubicunda</i>	brolga		C		31
animals	birds	Halcyonidae	<i>Dacelo leachii</i>	blue-winged kookaburra		C		16
animals	birds	Halcyonidae	<i>Todiramphus pyrrhopygius</i>	red-backed kingfisher		C		5
animals	birds	Halcyonidae	<i>Todiramphus macleayii</i>	forest kingfisher		C		10
animals	birds	Halcyonidae	<i>Todiramphus sanctus</i>	sacred kingfisher		C		21
animals	birds	Halcyonidae	<i>Dacelo novaeguineae</i>	laughing kookaburra		C		69
animals	birds	Hirundinidae	<i>Hirundo neoxena</i>	welcome swallow		C		42
animals	birds	Hirundinidae	<i>Petrochelidon nigricans</i>	tree martin		C		35
animals	birds	Hirundinidae	<i>Petrochelidon ariel</i>	fairy martin		C		14

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Jacanidae	<i>Irediparra gallinacea</i>	comb-crested jacana		C		4
animals	birds	Laridae	<i>Chroicocephalus novaehollandiae</i>	silver gull		C		1
animals	birds	Laridae	<i>Hydroprogne caspia</i>	Caspian tern		C		18
animals	birds	Laridae	<i>Chlidonias hybrida</i>	whiskered tern		C		4
animals	birds	Maluridae	<i>Malurus leucopterus</i>	white-winged fairy-wren		C		1
animals	birds	Maluridae	<i>Malurus lamberti</i>	variegated fairy-wren		C		19
animals	birds	Maluridae	<i>Malurus cyaneus</i>	superb fairy-wren		C		40
animals	birds	Maluridae	<i>Malurus melanocephalus</i>	red-backed fairy-wren		C		71
animals	birds	Megaluridae	<i>Cincloramphus cruralis</i>	brown songlark		C		3
animals	birds	Megaluridae	<i>Cincloramphus mathewsi</i>	rufous songlark		C		8
animals	birds	Megaluridae	<i>Megalurus timoriensis</i>	tawny grassbird		C		5
animals	birds	Megapodiidae	<i>Alectura lathami</i>	Australian brush-turkey		C		2
animals	birds	Meliphagidae	<i>Gavicalis virescens</i>	singing honeyeater		C		21
animals	birds	Meliphagidae	<i>Philemon citreogularis</i>	little friarbird		C		45
animals	birds	Meliphagidae	<i>Ptilotula penicillatus</i>	white-plumed honeyeater		C		4
animals	birds	Meliphagidae	<i>Acanthagenys rufogularis</i>	spiny-cheeked honeyeater		C		16
animals	birds	Meliphagidae	<i>Melithreptus albogularis</i>	white-throated honeyeater		C		24
animals	birds	Meliphagidae	<i>Plectorhyncha lanceolata</i>	striped honeyeater		C		19
animals	birds	Meliphagidae	<i>Manorina flavigula</i>	yellow-throated miner		C		88
animals	birds	Meliphagidae	<i>Entomyzon cyanotis</i>	blue-faced honeyeater		C		57
animals	birds	Meliphagidae	<i>Caligavis chrysops</i>	yellow-faced honeyeater		C		5
animals	birds	Meliphagidae	<i>Meliphaga lewinii</i>	Lewin's honeyeater		C		4
animals	birds	Meliphagidae	<i>Manorina melanocephala</i>	noisy miner		C		30
animals	birds	Meliphagidae	<i>Myzomela sanguinolenta</i>	scarlet honeyeater		C		1
animals	birds	Meliphagidae	<i>Philemon corniculatus</i>	noisy friarbird		C		31
animals	birds	Meliphagidae	<i>Lichmera indistincta</i>	brown honeyeater		C		41
animals	birds	Meropidae	<i>Merops ornatus</i>	rainbow bee-eater		C		28
animals	birds	Monarchidae	<i>Grallina cyanoleuca</i>	magpie-lark		C		137
animals	birds	Monarchidae	<i>Myiagra inquieta</i>	restless flycatcher		C		20
animals	birds	Monarchidae	<i>Myiagra rubecula</i>	leaden flycatcher		C		14
animals	birds	Monarchidae	<i>Myiagra cyanoleuca</i>	satin flycatcher		C		2
animals	birds	Motacillidae	<i>Anthus novaeseelandiae</i>	Australasian pipit		C		22
animals	birds	Nectariniidae	<i>Dicaeum hirundinaceum</i>	mistletoebird		C		38
animals	birds	Neosittidae	<i>Daphoenositta chrysoptera</i>	varied sittella		C		3
animals	birds	Oriolidae	<i>Sphecotheres vieillotii</i>	Australasian figbird		C		21
animals	birds	Oriolidae	<i>Oriolus sagittatus</i>	olive-backed oriole		C		17
animals	birds	Otididae	<i>Ardeotis australis</i>	Australian bustard		C		15
animals	birds	Pachycephalidae	<i>Pachycephala pectoralis</i>	golden whistler		C		1
animals	birds	Pachycephalidae	<i>Colluricincla harmonica</i>	grey shrike-thrush		C		16
animals	birds	Pachycephalidae	<i>Pachycephala rufiventris</i>	rufous whistler		C		39
animals	birds	Pardalotidae	<i>Pardalotus rubricatus</i>	red-browed pardalote		C		2
animals	birds	Pardalotidae	<i>Pardalotus striatus</i>	striated pardalote		C		50
animals	birds	Passeridae	<i>Passer domesticus</i>	house sparrow	Y			6
animals	birds	Pelecanidae	<i>Pelecanus conspicillatus</i>	Australian pelican		C		41
animals	birds	Petroicidae	<i>Petroica goodenovii</i>	red-capped robin		C		2
animals	birds	Petroicidae	<i>Microeca fascians</i>	jacky winter		C		5

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Petroicidae	<i>Eopsaltria australis</i>	eastern yellow robin		C		1
animals	birds	Phalacrocoracidae	<i>Phalacrocorax sulcirostris</i>	little black cormorant		C		52
animals	birds	Phalacrocoracidae	<i>Microcarbo melanoleucos</i>	little pied cormorant		C		40
animals	birds	Phalacrocoracidae	<i>Phalacrocorax varius</i>	pied cormorant		C		37
animals	birds	Phalacrocoracidae	<i>Phalacrocorax carbo</i>	great cormorant		C		15
animals	birds	Phasianidae	<i>Coturnix ypsilophora</i>	brown quail		C		10
animals	birds	Podargidae	<i>Podargus strigoides</i>	tawny frogmouth		C		6
animals	birds	Podicipedidae	<i>Podiceps cristatus</i>	great crested grebe		C		29
animals	birds	Podicipedidae	<i>Tachybaptus novaehollandiae</i>	Australasian grebe		C		69
animals	birds	Pomatostomidae	<i>Pomatostomus temporalis</i>	grey-crowned babbler		C		39
animals	birds	Psittacidae	<i>Trichoglossus chlorolepidotus</i>	scaly-breasted lorikeet		C		1
animals	birds	Psittacidae	<i>Platycercus adscitus</i>	pale-headed rosella		C		68
animals	birds	Psittacidae	<i>Trichoglossus haematodus moluccanus</i>	rainbow lorikeet		C		53
animals	birds	Psittacidae	<i>Aprosmictus erythropterus</i>	red-winged parrot		C		57
animals	birds	Psittacidae	<i>Melopsittacus undulatus</i>	budgerigar		C		3
animals	birds	Ptilonorhynchidae	<i>Ptilonorhynchus maculatus</i>	spotted bowerbird		C		24
animals	birds	Rallidae	<i>Porphyrio porphyrio</i>	purple swamphen		C		22
animals	birds	Rallidae	<i>Tribonyx ventralis</i>	black-tailed native-hen		C		1
animals	birds	Rallidae	<i>Gallinula tenebrosa</i>	dusky moorhen		C		42
animals	birds	Rallidae	<i>Fulica atra</i>	Eurasian coot		C		53
animals	birds	Recurvirostridae	<i>Himantopus himantopus</i>	black-winged stilt		C		43
animals	birds	Recurvirostridae	<i>Recurvirostra novaehollandiae</i>	red-necked avocet		C		2
animals	birds	Rhipiduridae	<i>Rhipidura rufifrons</i>	rufous fantail		C		5
animals	birds	Rhipiduridae	<i>Rhipidura leucophrys</i>	willie wagtail		C		102
animals	birds	Rhipiduridae	<i>Rhipidura albiscapa</i>	grey fantail		C		47
animals	birds	Rostratulidae	<i>Rostratula australis</i>	Australian painted snipe		V	V	2
animals	birds	Scolopacidae	<i>Gallinago hardwickii</i>	Latham's snipe		C		4/1
animals	birds	Scolopacidae	<i>Tringa stagnatilis</i>	marsh sandpiper		C		5
animals	birds	Scolopacidae	<i>Calidris acuminata</i>	sharp-tailed sandpiper		C		11
animals	birds	Strigidae	<i>Ninox boobook</i>	southern boobook		C		3
animals	birds	Sturnidae	<i>Sturnus vulgaris</i>	common starling	Y			1
animals	birds	Threskiornithidae	<i>Platalea regia</i>	royal spoonbill		C		22
animals	birds	Threskiornithidae	<i>Threskiornis molucca</i>	Australian white ibis		C		24
animals	birds	Threskiornithidae	<i>Plegadis falcinellus</i>	glossy ibis		C		6
animals	birds	Threskiornithidae	<i>Platalea flavipes</i>	yellow-billed spoonbill		C		22
animals	birds	Threskiornithidae	<i>Threskiornis spinicollis</i>	straw-necked ibis		C		34
animals	birds	Timaliidae	<i>Zosterops lateralis</i>	silvereye		C		15
animals	birds	Turnicidae	<i>Turnix velox</i>	little button-quail		C		1
animals	birds	Turnicidae	<i>Turnix varius</i>	painted button-quail		C		1
animals	birds	Tytonidae	<i>Tyto javanica</i>	eastern barn owl		C		7
animals	bony fish	Ambassidae	<i>Ambassis agassizii</i>	Agassiz's glassfish				4
animals	bony fish	Anguillidae	<i>Anguilla reinhardtii</i>	longfin eel				1
animals	bony fish	Apogonidae	<i>Glossamia aprion</i>	mouth almighty				1
animals	bony fish	Ariidae	<i>Neoarius graeffei</i>	blue catfish				4/1
animals	bony fish	Atherinidae	<i>Craterocephalus stercusmuscarum</i>	flyspecked hardyhead				4
animals	bony fish	Belonidae	<i>Strongylura krefftii</i>	freshwater longtom				1

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animals	bony fish	Clupeidae	<i>Nematalosa erebi</i>	bony bream				4
animals	bony fish	Eleotridae	<i>Philypnodon grandiceps</i>	flathead gudgeon				1
animals	bony fish	Eleotridae	<i>Hypseleotris species 1</i>	Midgley's carp gudgeon				4
animals	bony fish	Eleotridae	<i>Hypseleotris compressa</i>	empire gudgeon				2
animals	bony fish	Eleotridae	<i>Oxyeleotris lineolata</i>	sleepy cod				3
animals	bony fish	Eleotridae	<i>Mogurnda adspersa</i>	southern purplespotted gudgeon				2
animals	bony fish	Eleotridae	<i>Hypseleotris klunzingeri</i>	western carp gudgeon				2
animals	bony fish	Melanotaeniidae	<i>Melanotaenia splendida splendida</i>	eastern rainbowfish				4
animals	bony fish	Osteoglossidae	<i>Scleropages leichardti</i>	southern saratoga				2
animals	bony fish	Percichthyidae	<i>Macquaria ambigua</i>	golden perch				4
animals	bony fish	Plotosidae	<i>Tandanus tandanus</i>	freshwater catfish				4
animals	bony fish	Plotosidae	<i>Neosilurus hyrtl</i>	Hyrtl's catfish				4
animals	bony fish	Scorpaenidae	<i>Notesthes robusta</i>	bullrout				1/1
animals	bony fish	Terapontidae	<i>Leiopotherapon unicolor</i>	spangled perch				4/1
animals	bony fish	Terapontidae	<i>Scortum hillii</i>	leathery grunter				3
animals	bony fish	Terapontidae	<i>Amniataba percoides</i>	barred grunter				3
animals	mammals	Bovidae	<i>Bos taurus</i>	European cattle	Y			5
animals	mammals	Canidae	<i>Vulpes vulpes</i>	red fox	Y			6
animals	mammals	Canidae	<i>Canis lupus dingo</i>	dingo				1
animals	mammals	Dasyuridae	<i>Sminthopsis macroura</i>	stripe-faced dunnart			C	1
animals	mammals	Emballonuridae	<i>Saccolaimus flaviventris</i>	yellow-bellied sheath-tail bat			C	3
animals	mammals	Felidae	<i>Felis catus</i>	cat	Y			7
animals	mammals	Leporidae	<i>Oryctolagus cuniculus</i>	rabbit	Y			14
animals	mammals	Macropodidae	<i>Macropus dorsalis</i>	black-striped wallaby			C	1
animals	mammals	Macropodidae	<i>Wallabia bicolor</i>	swamp wallaby			C	11
animals	mammals	Macropodidae	<i>Macropus robustus</i>	common wallaroo			C	3
animals	mammals	Macropodidae	<i>Macropus giganteus</i>	eastern grey kangaroo			C	16
animals	mammals	Molossidae	<i>Chaerephon jobensis</i>	northern freetail bat			C	2/1
animals	mammals	Molossidae	<i>Mormopterus beccarii</i>	Beccari's freetail bat			C	1
animals	mammals	Molossidae	<i>Tadarida australis</i>	white-striped freetail bat			C	2
animals	mammals	Molossidae	<i>Mormopterus sp. 2</i>	eastern freetail bat			C	1
animals	mammals	Molossidae	<i>Mormopterus planiceps</i>	southern freetail bat			C	1
animals	mammals	Muridae	<i>Pseudomys delicatulus</i>	delicate mouse			C	4
animals	mammals	Muridae	<i>Hydromys chrysogaster</i>	water rat			C	3
animals	mammals	Muridae	<i>Pseudomys desertor</i>	desert mouse			C	1
animals	mammals	Muridae	<i>Leggadina forresti</i>	Forrest's mouse			C	2
animals	mammals	Muridae	<i>Rattus sordidus</i>	canefield rat			C	6/6
animals	mammals	Muridae	<i>Rattus tunneyi</i>	pale field-rat			C	5
animals	mammals	Muridae	<i>Mus musculus</i>	house mouse	Y			11
animals	mammals	Muridae	<i>Pseudomys gracilicaudatus</i>	eastern chestnut mouse			C	2/1
animals	mammals	Peramelidae	<i>Isoodon macrourus</i>	northern brown bandicoot			C	2
animals	mammals	Petauridae	<i>Petaurus breviceps</i>	sugar glider			C	3
animals	mammals	Phalangeridae	<i>Trichosurus vulpecula</i>	common brushtail possum			C	7
animals	mammals	Phascolarctidae	<i>Phascolarctos cinereus</i>	koala			C	2
animals	mammals	Potoroidae	<i>Aepyprymnus rufescens</i>	rufous bettong			C	7
animals	mammals	Pseudocheiridae	<i>Petauroides volans</i>	greater glider			C	1

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animals	mammals	Pteropodidae	<i>Pteropus scapulatus</i>	little red flying-fox		C		2
animals	mammals	Suidae	<i>Sus scrofa</i>	pig	Y			3
animals	mammals	Tachyglossidae	<i>Tachyglossus aculeatus</i>	short-beaked echidna		C		6
animals	mammals	Vespertilionidae	<i>Chalinolobus picatus</i>	little pied bat		NT		2/1
animals	mammals	Vespertilionidae	<i>Chalinolobus gouldii</i>	Gould's wattled bat		C		3/2
animals	mammals	Vespertilionidae	<i>Vespadelus pumilus</i>	eastern forest bat		C		1
animals	mammals	Vespertilionidae	<i>Scotorepens greyii</i>	little broad-nosed bat		C		7/1
animals	mammals	Vespertilionidae	<i>Nyctophilus sp.</i>					1
animals	mammals	Vespertilionidae	<i>Miniopterus schreibersii oceanensis</i>	eastern bent-wing bat		C		1
animals	mammals	Vespertilionidae	<i>Chalinolobus nigrogriseus</i>	hoary wattled bat		C		1/1
animals	mammals	Vespertilionidae	<i>Scotorepens balstoni</i>	inland broad-nosed bat		C		3
animals	mammals	Vespertilionidae	<i>Nyctophilus geoffroyi</i>	lesser long-eared bat		C		1/1
animals	mammals	Vespertilionidae	<i>Vespadelus trougtoni</i>	eastern cave bat		C		1
animals	reptiles	Agamidae	<i>Intellagama lesueurii</i>	eastern water dragon		C		1
animals	reptiles	Agamidae	<i>Tympanocryptis lineata</i>	lined earless dragon		C		3/3
animals	reptiles	Agamidae	<i>Pogona barbata</i>	bearded dragon		C		9/1
animals	reptiles	Agamidae	<i>Amphibolurus nobbi</i>			C		2
animals	reptiles	Agamidae	<i>Amphibolurus burnsi</i>			C		1
animals	reptiles	Agamidae	<i>Amphibolurus gilberti</i>	Gilbert's dragon		C		5/1
animals	reptiles	Agamidae	<i>Chlamydosaurus kingii</i>	frilled lizard		C		1
animals	reptiles	Agamidae	<i>Diporiphora australis</i>			C		2/1
animals	reptiles	Boidae	<i>Antaresia maculosa</i>	spotted python		C		6/2
animals	reptiles	Boidae	<i>Aspidites melanocephalus</i>	black-headed python		C		1
animals	reptiles	Carphodactylidae	<i>Nephrurus asper</i>	spiny knob-tailed gecko		C		2/1
animals	reptiles	Chelidae	<i>Rheodytes leukops</i>	Fitzroy River turtle		V	V	2
animals	reptiles	Chelidae	<i>Chelodina longicollis</i>	eastern snake-necked turtle		C		3/1
animals	reptiles	Chelidae	<i>Wollumbinia latisternum</i>	saw-shelled turtle		C		1
animals	reptiles	Chelidae	<i>Elseya albagula</i>	southern snapping turtle		C		3/2
animals	reptiles	Chelidae	<i>Emydura macquarii krefftii</i>	Krefft's river turtle		C		8/2
animals	reptiles	Colubridae	<i>Dendrelaphis punctulata</i>	common tree snake		C		5
animals	reptiles	Colubridae	<i>Tropidonophis mairii</i>	freshwater snake		C		4/1
animals	reptiles	Colubridae	<i>Boiga irregularis</i>	brown tree snake		C		3/2
animals	reptiles	Diplodactylidae	<i>Diplodactylus conspicillatus</i>	fat-tailed diplodactylus		C		1
animals	reptiles	Diplodactylidae	<i>Diplodactylus vittatus</i>	wood gecko		C		1
animals	reptiles	Diplodactylidae	<i>Strophurus williamsi</i>	soft-spined gecko		C		2
animals	reptiles	Diplodactylidae	<i>Oedura monilis</i>			C		7/4
animals	reptiles	Elapidae	<i>Pseudechis australis</i>	king brown snake		C		3
animals	reptiles	Elapidae	<i>Cryptophis boschmai</i>	Carpentaria whip snake		C		3/2
animals	reptiles	Elapidae	<i>Hoplocephalus bitorquatus</i>	pale-headed snake		C		2/1
animals	reptiles	Elapidae	<i>Denisonia maculata</i>	ornamental snake		V	V	3/1
animals	reptiles	Elapidae	<i>Demansia torquata</i>	collared whip snake		C		1
animals	reptiles	Elapidae	<i>Furina diadema</i>	red-naped snake		C		1
animals	reptiles	Elapidae	<i>Brachyuropsis australis</i>	coral snake		C		1
animals	reptiles	Elapidae	<i>Demansia psammophis</i>	yellow-faced whip snake		C		2
animals	reptiles	Elapidae	<i>Pseudonaja textilis</i>	eastern brown snake		C		8/2
animals	reptiles	Elapidae	<i>Vermicella annulata</i>	bandy-bandy		C		2/1

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animals	reptiles	Elapidae	<i>Suta suta</i>	myall snake		C		8/5
animals	reptiles	Gekkonidae	<i>Hemidactylus frenatus</i>	house gecko	Y			4
animals	reptiles	Gekkonidae	<i>Heteronotia binoei</i>	Bynoe's gecko		C		23/2
animals	reptiles	Gekkonidae	<i>Gehyra catenata</i>			C		10/1
animals	reptiles	Gekkonidae	<i>Gehyra dubia</i>			C		8/6
animals	reptiles	Pygopodidae	<i>Paradelma orientalis</i>	brigalow scaly-foot		V	V	1
animals	reptiles	Pygopodidae	<i>Lialis burtonis</i>	Burton's legless lizard		C		1
animals	reptiles	Scincidae	<i>Carlia munda</i>			C		1
animals	reptiles	Scincidae	<i>Menetia greyii</i>			C		6
animals	reptiles	Scincidae	<i>Menetia timlowi</i>			C		1/1
animals	reptiles	Scincidae	<i>Eulamprus quoyii</i>	eastern water skink		C		1/1
animals	reptiles	Scincidae	<i>Lerista fragilis</i>			C		11/1
animals	reptiles	Scincidae	<i>Carlia pectoralis</i>			C		7
animals	reptiles	Scincidae	<i>Ctenotus robustus</i>			C		14/2
animals	reptiles	Scincidae	<i>Egernia striolata</i>	tree skink		C		2/1
animals	reptiles	Scincidae	<i>Tiliqua scincoides</i>	eastern blue-tongued lizard		C		9/1
animals	reptiles	Scincidae	<i>Lygisaurus foliorum</i>			C		1
animals	reptiles	Scincidae	<i>Morethia boulengeri</i>			C		27/4
animals	reptiles	Scincidae	<i>Ctenotus taeniolatus</i>	copper-tailed skink		C		3
animals	reptiles	Scincidae	<i>Eulamprus brachysoma</i>			C		1/1
animals	reptiles	Scincidae	<i>Lampropholis delicata</i>			C		2/2
animals	reptiles	Scincidae	<i>Tiliqua rugosa aspera</i>	shingle-back (eastern subspecies)		C		4/1
animals	reptiles	Scincidae	<i>Cryptoblepharus pannosus</i>	ragged snake-eyed skink		C		8/1
animals	reptiles	Scincidae	<i>Glaphyromorphus punctulatus</i>			C		2
animals	reptiles	Scincidae	<i>Cryptoblepharus virgatus sensu lato</i>			C		1
animals	reptiles	Typhlopidae	<i>Ramphotyphlops grypus</i>			C		1/1
animals	reptiles	Typhlopidae	<i>Ramphotyphlops affinis</i>			C		1/1
animals	reptiles	Typhlopidae	<i>Ramphotyphlops ligatus</i>			C		3/3
animals	reptiles	Varanidae	<i>Varanus tristis</i>	black-tailed monitor		C		1
animals	reptiles	Varanidae	<i>Varanus gouldii</i>	sand monitor		C		7
fungi	club fungi	Basidiomycota	<i>Coprinus</i>			C		1/1
plants	ferns	Adiantaceae	<i>Cheilanthes sieberi</i>			C		1
plants	higher dicots	Acanthaceae	<i>Dipteracanthus australasicus subsp. corynothecus</i>			C		1/1
plants	higher dicots	Acanthaceae	<i>Rostellularia adscendens subsp. adscendens</i>			C		1/1
plants	higher dicots	Acanthaceae	<i>Rostellularia adscendens</i>			C		1/1
plants	higher dicots	Aizoaceae	<i>Zaleya galericulata subsp. galericulata</i>			C		1/1
plants	higher dicots	Aizoaceae	<i>Trianthema portulacastrum</i>	black pigweed	Y			1/1
plants	higher dicots	Amaranthaceae	<i>Amaranthus mitchellii</i>	Boggabri weed		C		2/2
plants	higher dicots	Amaranthaceae	<i>Alternanthera nodiflora</i>	joyweed		C		1/1
plants	higher dicots	Amaranthaceae	<i>Achyranthes aspera</i>			C		4/2
plants	higher dicots	Apocynaceae	<i>Carissa ovata</i>	currantbush		C		5
plants	higher dicots	Apocynaceae	<i>Parsonsia lanceolata</i>	northern silkpod		C		2/2
plants	higher dicots	Apocynaceae	<i>Alstonia constricta</i>	bitterbark		C		1
plants	higher dicots	Asteraceae	<i>Verbesina encelioides</i>	crownbeard	Y			2/2
plants	higher dicots	Asteraceae	<i>Calotis lappulacea</i>	yellow burr daisy		C		1/1
plants	higher dicots	Asteraceae	<i>Acmella grandiflora var. brachyglossa</i>			C		1/1

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plants	higher dicots	Asteraceae	<i>Senecio brigalowensis</i>			C		4/4
plants	higher dicots	Asteraceae	<i>Leiocarpa brevicompta</i>			C		1/1
plants	higher dicots	Asteraceae	<i>Cyanthillium cinereum</i>			C		1/1
plants	higher dicots	Boraginaceae	<i>Heliotropium geocharis</i>			C		1/1
plants	higher dicots	Brassicaceae	<i>Rorippa eustylis</i>			C		1/1
plants	higher dicots	Byttneriaceae	<i>Waltheria indica</i>			C		1/1
plants	higher dicots	Byttneriaceae	<i>Melochia pyramidata</i>		Y			1/1
plants	higher dicots	Caesalpiniaceae	<i>Lysiphyllum carronii</i>	ebony tree		C		1
plants	higher dicots	Caesalpiniaceae	<i>Senna costata</i>			C		1/1
plants	higher dicots	Caesalpiniaceae	<i>Lysiphyllum hookeri</i>	Queensland ebony		C		3/3
plants	higher dicots	Caesalpiniaceae	<i>Cassia brewsteri</i>			C		1/1
plants	higher dicots	Capparaceae	<i>Capparis</i>			C		1
plants	higher dicots	Capparaceae	<i>Capparis lasiantha</i>	nipan		C		1/1
plants	higher dicots	Casuarinaceae	<i>Casuarina cristata</i>	belah		C		1
plants	higher dicots	Casuarinaceae	<i>Casuarina cunninghamiana</i>			C		1
plants	higher dicots	Celastraceae	<i>Denhamia oleaster</i>			C		1/1
plants	higher dicots	Chenopodiaceae	<i>Chenopodium auricomiforme</i>			C		1/1
plants	higher dicots	Chenopodiaceae	<i>Sclerolaena birchii</i>	galvanised burr		C		1/1
plants	higher dicots	Chenopodiaceae	<i>Rhagodia spinescens</i>	thorny saltbush		C		1/1
plants	higher dicots	Chenopodiaceae	<i>Salsola australis</i>			C		1/1
plants	higher dicots	Chenopodiaceae	<i>Enchylaena</i>			C		1
plants	higher dicots	Chenopodiaceae	<i>Sclerolaena</i>			C		1
plants	higher dicots	Chenopodiaceae	<i>Atriplex muelleri</i>	lagoon saltbush		C		2/2
plants	higher dicots	Cleomaceae	<i>Cleome viscosa</i>	tick-weed		C		1/1
plants	higher dicots	Combretaceae	<i>Terminalia oblongata</i>			C		1
plants	higher dicots	Combretaceae	<i>Terminalia oblongata subsp. oblongata</i>			C		1/1
plants	higher dicots	Convolvulaceae	<i>Polymeria longifolia</i>	polymeria		C		1/1
plants	higher dicots	Convolvulaceae	<i>Ipomoea brownii</i>			C		1/1
plants	higher dicots	Convolvulaceae	<i>Ipomoea plebeia</i>	bellvine		C		1/1
plants	higher dicots	Convolvulaceae	<i>Evolvulus alsinoides var. villosicalyx</i>			C		1/1
plants	higher dicots	Convolvulaceae	<i>Convolvulus graminetinus</i>			C		3/3
plants	higher dicots	Convolvulaceae	<i>Ipomoea lonchophylla</i>			C		1/1
plants	higher dicots	Convolvulaceae	<i>Ipomoea polymorpha</i>			C		1/1
plants	higher dicots	Convolvulaceae	<i>Polymeria pusilla</i>			C		1/1
plants	higher dicots	Cucurbitaceae	<i>Cucumis picocarpus</i>			C		1/1
plants	higher dicots	Ebenaceae	<i>Diospyros humilis</i>	small-leaved ebony		C		1/1
plants	higher dicots	Erythroxylaceae	<i>Erythroxylum australe</i>	cocaine tree		C		2/1
plants	higher dicots	Euphorbiaceae	<i>Euphorbia tannensis subsp. eremophila</i>			C		1/1
plants	higher dicots	Euphorbiaceae	<i>Euphorbia</i>			C		1/1
plants	higher dicots	Euphorbiaceae	<i>Euphorbia coghlanii</i>			C		2/2
plants	higher dicots	Euphorbiaceae	<i>Adriana urticoides var. urticoides</i>			C		4/4
plants	higher dicots	Fabaceae	<i>Indigofera colutea</i>	sticky indigo		C		1/1
plants	higher dicots	Fabaceae	<i>Indigofera hirsuta</i>	hairy indigo		C		1/1
plants	higher dicots	Fabaceae	<i>Desmodium filiforme</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Stylosanthes hamata</i>		Y			1/1
plants	higher dicots	Fabaceae	<i>Alysicarpus muelleri</i>			C		2/2

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plants	higher dicots	Fabaceae	<i>Indigofera linifolia</i>			C		2/2
plants	higher dicots	Fabaceae	<i>Tephrosia dietrichiae</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Desmodium campylocaulon</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Macroptilium lathyroides</i>		Y			1/1
plants	higher dicots	Fabaceae	<i>Rhynchosia minima</i> var. <i>australis</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Vigna lanceolata</i> var. <i>lanceolata</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Sesbania cannabina</i> var. <i>cannabina</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Zornia muriculata</i> subsp. <i>angustata</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Crotalaria mitchellii</i> subsp. <i>mitchellii</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Crotalaria dissitiflora</i> subsp. <i>dissitiflora</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Vigna</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Galactia</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Lotus australis</i>	Australian trefoil		C		1/1
plants	higher dicots	Fabaceae	<i>Vigna suberecta</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Vigna trilobata</i>		Y			1/1
plants	higher dicots	Fabaceae	<i>Crotalaria juncea</i>	sunhemp	Y			1/1
plants	higher dicots	Fabaceae	<i>Glycine latifolia</i>			C		4/4
plants	higher dicots	Goodeniaceae	<i>Scaevola humilis</i>			C		1/1
plants	higher dicots	Haloragaceae	<i>Haloragis stricta</i>			C		1/1
plants	higher dicots	Haloragaceae	<i>Haloragis aspera</i>	raspweed		C		1/1
plants	higher dicots	Lamiaceae	<i>Teucrium integrifolium</i>			C		2/2
plants	higher dicots	Lamiaceae	<i>Basilicum polystachyon</i>			C		1/1
plants	higher dicots	Loranthaceae	<i>Dendrophthoe homoplastica</i>			C		1/1
plants	higher dicots	Malvaceae	<i>Abutilon oxycarpum</i> var. <i>incanum</i>			C		1/1
plants	higher dicots	Malvaceae	<i>Malvastrum americanum</i> var. <i>americanum</i>		Y			2/2
plants	higher dicots	Malvaceae	<i>Abelmoschus ficulneus</i>	native rosella		C		2/2
plants	higher dicots	Malvaceae	<i>Hibiscus verdcourtii</i>			C		2/2
plants	higher dicots	Malvaceae	<i>Gossypium sturtianum</i>			C		1/1
plants	higher dicots	Malvaceae	<i>Abutilon guineense</i>			C		2/2
plants	higher dicots	Malvaceae	<i>Abutilon nobile</i>			C		2/2
plants	higher dicots	Malvaceae	<i>Sida pleiantha</i>			C		2/2
plants	higher dicots	Malvaceae	<i>Sida spinosa</i>	spiny sida	Y			1/1
plants	higher dicots	Malvaceae	<i>Sida laevis</i>			C		1/1
plants	higher dicots	Malvaceae	<i>Hibiscus</i>			C		1
plants	higher dicots	Mimosaceae	<i>Acacia harpophylla</i>	brigalow		C		5/1
plants	higher dicots	Mimosaceae	<i>Acacia omalophylla</i>			C		1/1
plants	higher dicots	Mimosaceae	<i>Acacia salicina</i>	doolan		C		1/1
plants	higher dicots	Mimosaceae	<i>Acacia excelsa</i>			C		1
plants	higher dicots	Mimosaceae	<i>Acacia shirleyi</i>	lancewood		C		1
plants	higher dicots	Mimosaceae	<i>Albizia lebbbeck</i>	Indian siris		C		1/1
plants	higher dicots	Mimosaceae	<i>Acacia melvillei</i>			C		4/4
plants	higher dicots	Mimosaceae	<i>Acacia holosericea</i>			C		1
plants	higher dicots	Mimosaceae	<i>Acacia leiocalyx</i> subsp. <i>leiocalyx</i>			C		1/1
plants	higher dicots	Mimosaceae	<i>Neptunia gracilis</i> forma <i>gracilis</i>			C		2/2
plants	higher dicots	Mimosaceae	<i>Acacia excelsa</i> subsp. <i>excelsa</i>			C		2/2
plants	higher dicots	Mimosaceae	<i>Acacia stenophylla</i>	belalie		C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	higher dicots	Moraceae	<i>Ficus opposita</i>			C		1
plants	higher dicots	Myoporaceae	<i>Eremophila mitchellii</i>			C		3
plants	higher dicots	Myrtaceae	<i>Eucalyptus cambageana</i>	Dawson gum		C		1
plants	higher dicots	Myrtaceae	<i>Eucalyptus thozetiana</i>			C		1
plants	higher dicots	Myrtaceae	<i>Melaleuca tamariscina</i>			C		1/1
plants	higher dicots	Myrtaceae	<i>Corymbia erythrophloia</i>	variable-barked bloodwood		C		1/1
plants	higher dicots	Myrtaceae	<i>Melaleuca linariifolia</i>	snow-in summer		C		1
plants	higher dicots	Myrtaceae	<i>Eucalyptus camaldulensis</i>			C		1
plants	higher dicots	Myrtaceae	<i>Eucalyptus crebra</i>	narrow-leaved red ironbark		C		2
plants	higher dicots	Myrtaceae	<i>Eucalyptus coolabah</i>	coolabah		C		3/1
plants	higher dicots	Myrtaceae	<i>Eucalyptus populnea</i>	poplar box		C		2/1
plants	higher dicots	Myrtaceae	<i>Eucalyptus tenuipes</i>	narrow-leaved white mahogany		C		2/2
plants	higher dicots	Myrtaceae	<i>Melaleuca viminalis</i>			C		1
plants	higher dicots	Myrtaceae	<i>Corymbia dallachiana</i>			C		2
plants	higher dicots	Myrtaceae	<i>Corymbia tessellaris</i>	Moreton Bay ash		C		1
plants	higher dicots	Myrtaceae	<i>Corymbia clarksoniana</i>			C		2
plants	higher dicots	Nyctaginaceae	<i>Boerhavia pubescens</i>			C		1/1
plants	higher dicots	Nyctaginaceae	<i>Boerhavia sp. (St George A.Hill AQ399299)</i>			C		1/1
plants	higher dicots	Nyctaginaceae	<i>Boerhavia dominii</i>			C		1/1
plants	higher dicots	Oleaceae	<i>Notelaea microcarpa</i> var. <i>microcarpa</i>			C		1/1
plants	higher dicots	Oleaceae	<i>Jasminum didymum</i> subsp. <i>lineare</i>			C		1/1
plants	higher dicots	Pentapetaceae	<i>Melhania oblongifolia</i>			C		1/1
plants	higher dicots	Phyllanthaceae	<i>Notoleptopus decaisnei</i> var. <i>decaisnei</i>			C		1/1
plants	higher dicots	Phyllanthaceae	<i>Phyllanthus maderaspatensis</i>			C		3/3
plants	higher dicots	Phyllanthaceae	<i>Phyllanthus lacunarius</i>			C		1/1
plants	higher dicots	Picrodendraceae	<i>Petalostigma pubescens</i>	quinine tree		C		1
plants	higher dicots	Pittosporaceae	<i>Bursaria incana</i>			C		2/1
plants	higher dicots	Plumbaginaceae	<i>Plumbago zeylanica</i>	native plumbago		C		1/1
plants	higher dicots	Proteaceae	<i>Grevillea decora</i> subsp. <i>decora</i>			C		1/1
plants	higher dicots	Rhamnaceae	<i>Alphitonia excelsa</i>	soap tree		C		2
plants	higher dicots	Rhamnaceae	<i>Ventilago viminalis</i>	supplejack		C		1/1
plants	higher dicots	Rubiaceae	<i>Oldenlandia corymbosa</i> var. <i>corymbosa</i>		Y			1/1
plants	higher dicots	Rubiaceae	<i>Oldenlandia coerulescens</i>			C		1/1
plants	higher dicots	Rubiaceae	<i>Psydrax johnsonii</i>			C		1/1
plants	higher dicots	Rubiaceae	<i>Spermacoce brachystema</i>			C		1/1
plants	higher dicots	Rutaceae	<i>Geijera parviflora</i>	wilga		C		2/1
plants	higher dicots	Rutaceae	<i>Flindersia dissosperma</i>			C		2/2
plants	higher dicots	Sapindaceae	<i>Dodonaea viscosa</i> subsp. <i>spatulata</i>			C		1/1
plants	higher dicots	Sapindaceae	<i>Atalaya hemiglauca</i>			C		2
plants	higher dicots	Sapindaceae	<i>Alectryon oleifolius</i> subsp. <i>elongatus</i>			C		2/2
plants	higher dicots	Sparrmanniaceae	<i>Corchorus trilocularis</i>			C		2/2
plants	higher dicots	Sterculiaceae	<i>Brachychiton rupestris</i>			C		1
plants	higher dicots	Thymelaeaceae	<i>Pimelea haematostachya</i>			C		2/2
plants	higher dicots	Thymelaeaceae	<i>Pimelea microcephala</i> subsp. <i>microcephala</i>			C		2/2
plants	higher dicots	Verbenaceae	<i>Verbena macrostachya</i>			C		1/1
plants	higher dicots	Verbenaceae	<i>Verbena africana</i>			C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	higher dicots	Zygophyllaceae	<i>Tribulus terrestris</i>	caltrop		C		1/1
plants	higher dicots	Zygophyllaceae	<i>Tribulus micrococcus</i>	yellow vine		C		2/2
plants	monocots	Commelinaceae	<i>Commelina ensifolia</i>	scurvy grass		C		2/2
plants	monocots	Cyperaceae	<i>Bulbostylis barbata</i>			C		1/1
plants	monocots	Cyperaceae	<i>Cyperus gilesii</i>			C		1/1
plants	monocots	Cyperaceae	<i>Cyperus clarus</i>			V		1/1
plants	monocots	Cyperaceae	<i>Cyperus bifax</i>	western nutgrass		C		1/1
plants	monocots	Cyperaceae	<i>Cyperus</i>			C		1
plants	monocots	Hypoxidaceae	<i>Hypoxis pratensis var. pratensis</i>			C		1/1
plants	monocots	Laxmanniaceae	<i>Lomandra</i>			C		2
plants	monocots	Poaceae	<i>Eriochloa crebra</i>	spring grass		C		1/1
plants	monocots	Poaceae	<i>Themeda triandra</i>	kangaroo grass		C		1
plants	monocots	Poaceae	<i>Triraphis mollis</i>	purple plumegrass		C		1/1
plants	monocots	Poaceae	<i>Astrebla lappacea</i>	curly mitchell grass		C		1/1
plants	monocots	Poaceae	<i>Digitaria brownii</i>			C		3/3
plants	monocots	Poaceae	<i>Eriochloa procera</i>	slender cupgrass		C		3/3
plants	monocots	Poaceae	<i>Aristida latifolia</i>	feathertop wiregrass		C		1/1
plants	monocots	Poaceae	<i>Aristida leptopoda</i>	white speargrass		C		2/2
plants	monocots	Poaceae	<i>Astrebla elymoides</i>	hoop mitchell grass		C		1/1
plants	monocots	Poaceae	<i>Astrebla squarrosa</i>	bull mitchell grass		C		2/1
plants	monocots	Poaceae	<i>Cenchrus echinatus</i>	Mossman River grass	Y			1/1
plants	monocots	Poaceae	<i>Dinebra retroflexa</i>		Y			1/1
plants	monocots	Poaceae	<i>Brachyachne tenella</i>			C		1/1
plants	monocots	Poaceae	<i>Dichanthium setosum</i>			NT	V	1/1
plants	monocots	Poaceae	<i>Enneapogon pallidus</i>	conetop nineawn		C		1/1
plants	monocots	Poaceae	<i>Paspalidium gracile</i>	slender panic		C		2/2
plants	monocots	Poaceae	<i>Bothriochloa pertusa</i>		Y			2/2
plants	monocots	Poaceae	<i>Cymbopogon refractus</i>	barbed-wire grass		C		1
plants	monocots	Poaceae	<i>Enneapogon truncatus</i>			C		3/3
plants	monocots	Poaceae	<i>Eragrostis tenellula</i>	delicate lovegrass		C		1/1
plants	monocots	Poaceae	<i>Heteropogon contortus</i>	black speargrass		C		2
plants	monocots	Poaceae	<i>Iseilema vaginiflorum</i>	red flinders grass		C		4/4
plants	monocots	Poaceae	<i>Sporobolus disjunctus</i>			C		1/1
plants	monocots	Poaceae	<i>Aristida caput-medusae</i>			C		1
plants	monocots	Poaceae	<i>Enneapogon lindleyanus</i>			C		3
plants	monocots	Poaceae	<i>Panicum queenslandicum</i>			C		1
plants	monocots	Poaceae	<i>Paspalidium globoideum</i>	sago grass		C		2/2
plants	monocots	Poaceae	<i>Ancistrachne uncinulata</i>	hooky grass		C		2/1
plants	monocots	Poaceae	<i>Paspalidium breviflorum</i>			C		1/1
plants	monocots	Poaceae	<i>Paspalidium caespitosum</i>	brigalow grass		C		2/2
plants	monocots	Poaceae	<i>Sporobolus actinocladus</i>	katoora grass		C		1/1
plants	monocots	Poaceae	<i>Paspalidium albobillosum</i>			C		1/1
plants	monocots	Poaceae	<i>Digitaria divaricatissima</i>	spreading umbrella grass		C		1/1
plants	monocots	Poaceae	<i>Thyridolepis mitchelliana</i>	mulga mitchell grass		C		1/1
plants	monocots	Poaceae	<i>Dichanthium queenslandicum</i>			V	V	10/10
plants	monocots	Poaceae	<i>Leptochloa panicea subsp. brachiata</i>		Y			1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	monocots	Poaceae	<i>Dichanthium sericeum subsp. sericeum</i>			C		3/3
plants	monocots	Poaceae	<i>Aristida jerichoensis var. subspinulifera</i>			C		1/1
plants	monocots	Poaceae	<i>Eriachne mucronata forma (Alpha C.E.Hubbard 7882)</i>			C		1/1
plants	monocots	Poaceae	<i>Digitaria orbata</i>			C		1/1
plants	monocots	Poaceae	<i>Setaria surgens</i>			C		1/1
plants	monocots	Poaceae	<i>Setaria italica</i>	foxtail millet	Y			1/1
plants	monocots	Poaceae	<i>Paspalidium</i>			C		4
plants	monocots	Poaceae	<i>Sporobolus</i>			C		3
plants	monocots	Poaceae	<i>Eragrostis</i>			C		3
plants	monocots	Poaceae	<i>Entolasia</i>			C		1
plants	monocots	Poaceae	<i>Poaceae</i>			C		1
plants	monocots	Poaceae	<i>Aristida</i>			C		3

CODES

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

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

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

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

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

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



Wildlife Online Extract

Search Criteria: Species List for a Defined Area
Species: All
Type: All
Status: All
Records: All
Date: All
Latitude: 23.9978 to 23.5353
Longitude: 148.4992 to 147.9356
Email: hdick@aacrc.net.au
Date submitted: Monday 28 May 2012 16:03:26
Date extracted: Monday 28 May 2012 16:10:20

The number of records retrieved = 865

Disclaimer

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Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Bufonidae	<i>Rhinella marina</i>	cane toad	Y			4
animals	amphibians	Hylidae	<i>Litoria inermis</i>	bumpy rocketfrog		C		7
animals	amphibians	Hylidae	<i>Litoria peronii</i>	emerald spotted treefrog		C		3/1
animals	amphibians	Hylidae	<i>Litoria rubella</i>	ruddy treefrog		C		5/1
animals	amphibians	Hylidae	<i>Litoria caerulea</i>	common green treefrog		C		10/1
animals	amphibians	Hylidae	<i>Cyclorana brevipes</i>	superb collared frog		C		3/2
animals	amphibians	Hylidae	<i>Litoria latopalmata</i>	broad palmed rocketfrog		C		8/1
animals	amphibians	Hylidae	<i>Cyclorana alboguttata</i>	greenstripe frog		C		5
animals	amphibians	Hylidae	<i>Cyclorana novaehollandiae</i>	eastern snapping frog		C		5
animals	amphibians	Hylidae	<i>Litoria fallax</i>	eastern sedgefrog		C		4
animals	amphibians	Hylidae	<i>Litoria rothii</i>	northern laughing treefrog		C		1
animals	amphibians	Limnodynastidae	<i>Limnodynastes salmini</i>	salmon striped frog		C		2
animals	amphibians	Limnodynastidae	<i>Platyplectrum ornatum</i>	ornate burrowing frog		C		4
animals	amphibians	Limnodynastidae	<i>Limnodynastes tasmaniensis</i>	spotted grassfrog		C		8/1
animals	amphibians	Limnodynastidae	<i>Limnodynastes terraereginae</i>	scarlet sided pobblebonk		C		3
animals	amphibians	Myobatrachidae	<i>Uperoleia rugosa</i>	chubby gungan		C		1
animals	birds	Acanthizidae	<i>Acanthiza nana</i>	yellow thornbill		C		33
animals	birds	Acanthizidae	<i>Gerygone fusca</i>	western gerygone		C		7
animals	birds	Acanthizidae	<i>Smicrornis brevirostris</i>	weebill		C		63
animals	birds	Acanthizidae	<i>Chthonicola sagittata</i>	speckled warbler		C		14
animals	birds	Acanthizidae	<i>Acanthiza chrysorrhoa</i>	yellow-rumped thornbill		C		7
animals	birds	Acanthizidae	<i>Sericornis frontalis</i>	white-browed scrubwren		C		4
animals	birds	Acanthizidae	<i>Gerygone albogularis</i>	white-throated gerygone		C		53
animals	birds	Acanthizidae	<i>Acanthiza reguloides</i>	buff-rumped thornbill		C		10
animals	birds	Acanthizidae	<i>Acanthiza apicalis</i>	inland thornbill		C		34
animals	birds	Acanthizidae	<i>Acanthiza pusilla</i>	brown thornbill		C		1
animals	birds	Acanthizidae	<i>Gerygone mouki</i>	brown gerygone		C		1
animals	birds	Accipitridae	<i>Accipiter fasciatus</i>	brown goshawk		C		11
animals	birds	Accipitridae	<i>Aquila audax</i>	wedge-tailed eagle		C		34
animals	birds	Accipitridae	<i>Accipiter cirrocephalus</i>	collared sparrowhawk		C		1
animals	birds	Accipitridae	<i>Hieraaetus morphnoides</i>	little eagle		C		3
animals	birds	Accipitridae	<i>Haliaeetus leucogaster</i>	white-bellied sea-eagle		C		2
animals	birds	Accipitridae	<i>Haliastur sphenurus</i>	whistling kite		C		67
animals	birds	Accipitridae	<i>Aviceda subcristata</i>	Pacific baza		C		8
animals	birds	Accipitridae	<i>Circus approximans</i>	swamp harrier		C		4
animals	birds	Accipitridae	<i>Pandion cristatus</i>	eastern osprey		C		1
animals	birds	Accipitridae	<i>Elanus axillaris</i>	black-shouldered kite		C		25
animals	birds	Accipitridae	<i>Circus assimilis</i>	spotted harrier		C		9
animals	birds	Accipitridae	<i>Milvus migrans</i>	black kite		C		23
animals	birds	Acrocephalidae	<i>Acrocephalus australis</i>	Australian reed-warbler		C		7
animals	birds	Aegotheidae	<i>Aegotheles cristatus</i>	Australian owl-nightjar		C		6
animals	birds	Alaudidae	<i>Mirafra javanica</i>	Horsfield's bushlark		C		23
animals	birds	Alcedinidae	<i>Ceyx azureus</i>	azure kingfisher		C		2
animals	birds	Anatidae	<i>Tadorna radjah</i>	radjah shelduck		NT		1
animals	birds	Anatidae	<i>Malacorhynchus membranaceus</i>	pink-eared duck		C		9
animals	birds	Anatidae	<i>Chenonetta jubata</i>	Australian wood duck		C		41

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Anatidae	<i>Cygnus atratus</i>	black swan		C		13
animals	birds	Anatidae	<i>Anas superciliosa</i>	Pacific black duck		C		82
animals	birds	Anatidae	<i>Aythya australis</i>	hardhead		C		43
animals	birds	Anatidae	<i>Anas rhynchotis</i>	Australasian shoveler		C		7
animals	birds	Anatidae	<i>Nettapus coromandelianus</i>	cotton pygmy-goose		NT		2
animals	birds	Anatidae	<i>Nettapus pulchellus</i>	green pygmy-goose		C		2
animals	birds	Anatidae	<i>Dendrocygna arcuata</i>	wandering whistling-duck		C		5
animals	birds	Anatidae	<i>Dendrocygna eytoni</i>	plumed whistling-duck		C		20
animals	birds	Anatidae	<i>Anas gracilis</i>	grey teal		C		62
animals	birds	Anhingidae	<i>Anhinga novaehollandiae</i>	Australasian darter		C		40
animals	birds	Apodidae	<i>Hirundapus caudacutus</i>	white-throated needletail		C		1
animals	birds	Ardeidae	<i>Ardea pacifica</i>	white-necked heron		C		20
animals	birds	Ardeidae	<i>Ardea modesta</i>	eastern great egret		C		34
animals	birds	Ardeidae	<i>Egretta garzetta</i>	little egret		C		18
animals	birds	Ardeidae	<i>Ixobrychus dubius</i>	Australian little bittern		C		1
animals	birds	Ardeidae	<i>Ixobrychus flavicollis</i>	black bittern		C		2
animals	birds	Ardeidae	<i>Nycticorax caledonicus</i>	Nankeen night-heron		C		14
animals	birds	Ardeidae	<i>Ardea intermedia</i>	intermediate egret		C		26
animals	birds	Ardeidae	<i>Egretta novaehollandiae</i>	white-faced heron		C		31
animals	birds	Artamidae	<i>Artamus superciliosus</i>	white-browed woodswallow		C		8
animals	birds	Artamidae	<i>Artamus leucorhynchus</i>	white-breasted woodswallow		C		11
animals	birds	Artamidae	<i>Cracticus torquatus</i>	grey butcherbird		C		34
animals	birds	Artamidae	<i>Strepera graculina</i>	pieb currawong		C		15
animals	birds	Artamidae	<i>Artamus cinereus</i>	black-faced woodswallow		C		8
animals	birds	Artamidae	<i>Cracticus tibicen</i>	Australian magpie		C		145
animals	birds	Artamidae	<i>Artamus personatus</i>	masked woodswallow		C		9
animals	birds	Artamidae	<i>Cracticus nigrogularis</i>	pieb butcherbird		C		105
animals	birds	Artamidae	<i>Artamus minor</i>	little woodswallow		C		4
animals	birds	Burhinidae	<i>Burhinus grallarius</i>	bush stone-curlew		C		5
animals	birds	Cacatuidae	<i>Eolophus roseicapillus</i>	galah		C		26
animals	birds	Cacatuidae	<i>Calyptorhynchus banksii</i>	red-tailed black-cockatoo		C		4
animals	birds	Cacatuidae	<i>Calyptorhynchus funereus</i>	yellow-tailed black-cockatoo		C		3
animals	birds	Cacatuidae	<i>Nymphicus hollandicus</i>	cockatiel		C		56
animals	birds	Cacatuidae	<i>Cacatua galerita</i>	sulphur-crested cockatoo		C		106
animals	birds	Campephagidae	<i>Lalage sueurii</i>	white-winged triller		C		13
animals	birds	Campephagidae	<i>Coracina maxima</i>	ground cuckoo-shrike		C		14
animals	birds	Campephagidae	<i>Coracina papuensis</i>	white-bellied cuckoo-shrike		C		7
animals	birds	Campephagidae	<i>Coracina tenuirostris</i>	cicadabird		C		1
animals	birds	Campephagidae	<i>Coracina novaehollandiae</i>	black-faced cuckoo-shrike		C		59
animals	birds	Casuariidae	<i>Dromaius novaehollandiae</i>	emu		C		12
animals	birds	Charadriidae	<i>Vanellus miles miles</i>	masked lapwing (northern subspecies)		C		5
animals	birds	Charadriidae	<i>Pluvialis fulva</i>	Pacific golden plover		C		3
animals	birds	Charadriidae	<i>Vanellus miles novaehollandiae</i>	masked lapwing (southern subspecies)		C		13
animals	birds	Charadriidae	<i>Vanellus miles</i>	masked lapwing		C		22
animals	birds	Charadriidae	<i>Erythronyx cinctus</i>	red-kneed dotterel		C		2
animals	birds	Charadriidae	<i>Elseyonis melanops</i>	black-fronted dotterel		C		21

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animals	birds	Charadriidae	<i>Vanellus tricolor</i>	banded lapwing		C		3
animals	birds	Ciconiidae	<i>Ephippiorhynchus asiaticus</i>	black-necked stork		NT		4
animals	birds	Cisticolidae	<i>Cisticola exilis</i>	golden-headed cisticola		C		31
animals	birds	Climacteridae	<i>Cormobates leucophaea metastasis</i>	white-throated treecreeper (southern)		C		4
animals	birds	Climacteridae	<i>Climacteris picumnus</i>	brown treecreeper		C		2
animals	birds	Columbidae	<i>Phaps chalcoptera</i>	common bronzewing		C		18
animals	birds	Columbidae	<i>Geopelia cuneata</i>	diamond dove		C		8
animals	birds	Columbidae	<i>Geopelia striata</i>	peaceful dove		C		55
animals	birds	Columbidae	<i>Streptopelia chinensis</i>	spotted dove	Y			1
animals	birds	Columbidae	<i>Geopelia humeralis</i>	bar-shouldered dove		C		35
animals	birds	Columbidae	<i>Columba livia</i>	rock dove	Y			1
animals	birds	Columbidae	<i>Ocyphaps lophotes</i>	crested pigeon		C		60
animals	birds	Coraciidae	<i>Eurystomus orientalis</i>	dollarbird		C		19
animals	birds	Corcoracidae	<i>Corcorax melanorhamphos</i>	white-winged chough		C		13
animals	birds	Corcoracidae	<i>Struthidea cinerea</i>	apostlebird		C		43
animals	birds	Corvidae	<i>Corvus bennetti</i>	little crow		C		6
animals	birds	Corvidae	<i>Corvus coronoides</i>	Australian raven		C		36
animals	birds	Corvidae	<i>Corvus orru</i>	Torresian crow		C		54
animals	birds	Corvidae	<i>Corvus sp.</i>					60
animals	birds	Cuculidae	<i>Cacomantis variolosus</i>	brush cuckoo		C		2/1
animals	birds	Cuculidae	<i>Eudynamys orientalis</i>	eastern koel		C		14
animals	birds	Cuculidae	<i>Chalcites minutillus minutillus</i>	little bronze-cuckoo		C		2/1
animals	birds	Cuculidae	<i>Scythrops novaehollandiae</i>	channel-billed cuckoo		C		10
animals	birds	Cuculidae	<i>Centropus phasianinus</i>	pheasant coucal		C		41
animals	birds	Cuculidae	<i>Chalcites basalis</i>	Horsfield's bronze-cuckoo		C		2
animals	birds	Cuculidae	<i>Chalcites lucidus</i>	shining bronze-cuckoo		C		8
animals	birds	Cuculidae	<i>Chalcites osculans</i>	black-eared cuckoo		C		3
animals	birds	Cuculidae	<i>Cacomantis pallidus</i>	pallid cuckoo		C		7
animals	birds	Dicruridae	<i>Dicrurus bracteatus</i>	spangled drongo		C		8
animals	birds	Estrildidae	<i>Lonchura castaneothorax</i>	chestnut-breasted mannikin		C		7
animals	birds	Estrildidae	<i>Neochmia modesta</i>	plum-headed finch		C		3
animals	birds	Estrildidae	<i>Taeniopygia guttata</i>	zebra finch		C		11
animals	birds	Estrildidae	<i>Taeniopygia bichenovii</i>	double-barred finch		C		82
animals	birds	Falconidae	<i>Falco berigora</i>	brown falcon		C		57
animals	birds	Falconidae	<i>Falco peregrinus</i>	peregrine falcon		C		2
animals	birds	Falconidae	<i>Falco subniger</i>	black falcon		C		3
animals	birds	Falconidae	<i>Falco cenchroides</i>	nankeen kestrel		C		46
animals	birds	Falconidae	<i>Falco longipennis</i>	Australian hobby		C		9
animals	birds	Gruidae	<i>Grus rubicunda</i>	brulga		C		35
animals	birds	Halcyonidae	<i>Todiramphus pyrrhopygius</i>	red-backed kingfisher		C		5
animals	birds	Halcyonidae	<i>Todiramphus macleayii</i>	forest kingfisher		C		3
animals	birds	Halcyonidae	<i>Todiramphus sanctus</i>	sacred kingfisher		C		17
animals	birds	Halcyonidae	<i>Dacelo leachii</i>	blue-winged kookaburra		C		5
animals	birds	Halcyonidae	<i>Dacelo novaeguineae</i>	laughing kookaburra		C		73
animals	birds	Hirundinidae	<i>Hirundo neoxena</i>	welcome swallow		C		19
animals	birds	Hirundinidae	<i>Petrochelidon ariel</i>	fairy martin		C		11

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animals	birds	Hirundinidae	<i>Petrochelidon nigricans</i>	tree martin		C		21
animals	birds	Jacanidae	<i>Irediparra gallinacea</i>	comb-crested jacana		C		4
animals	birds	Laridae	<i>Chlidonias hybrida</i>	whiskered tern		C		9
animals	birds	Laridae	<i>Hydroprogne caspia</i>	Caspian tern		C		22
animals	birds	Laridae	<i>Gelochelidon nilotica</i>	gull-billed tern		C		3
animals	birds	Laridae	<i>Chroicocephalus novaehollandiae</i>	silver gull		C		34
animals	birds	Maluridae	<i>Malurus melanocephalus</i>	red-backed fairy-wren		C		74
animals	birds	Maluridae	<i>Malurus lamberti</i>	variegated fairy-wren		C		40
animals	birds	Maluridae	<i>Malurus cyaneus</i>	superb fairy-wren		C		33
animals	birds	Megaluridae	<i>Megalurus grammacus</i>	little grassbird		C		1
animals	birds	Megaluridae	<i>Megalurus timoriensis</i>	tawny grassbird		C		4
animals	birds	Megaluridae	<i>Cincloramphus cruralis</i>	brown songlark		C		8
animals	birds	Megaluridae	<i>Cincloramphus mathewsi</i>	rufous songlark		C		8
animals	birds	Megapodiidae	<i>Alectura lathami</i>	Australian brush-turkey		C		3
animals	birds	Meliphagidae	<i>Entomyzon cyanotis</i>	blue-faced honeyeater		C		40
animals	birds	Meliphagidae	<i>Melithreptus brevirostris</i>	brown-headed honeyeater		C		1
animals	birds	Meliphagidae	<i>Plectorhyncha lanceolata</i>	striped honeyeater		C		35
animals	birds	Meliphagidae	<i>Melithreptus albogularis</i>	white-throated honeyeater		C		37
animals	birds	Meliphagidae	<i>Acanthagenys rufogularis</i>	spiny-cheeked honeyeater		C		16
animals	birds	Meliphagidae	<i>Ptilotula penicillatus</i>	white-plumed honeyeater		C		1
animals	birds	Meliphagidae	<i>Meliphaga lewinii</i>	Lewin's honeyeater		C		8
animals	birds	Meliphagidae	<i>Caligavis chrysops</i>	yellow-faced honeyeater		C		6
animals	birds	Meliphagidae	<i>Manorina flavigula</i>	yellow-throated miner		C		61
animals	birds	Meliphagidae	<i>Gavicalis virescens</i>	singing honeyeater		C		41
animals	birds	Meliphagidae	<i>Lichmera indistincta</i>	brown honeyeater		C		30
animals	birds	Meliphagidae	<i>Melithreptus gularis</i>	black-chinned honeyeater		NT		1
animals	birds	Meliphagidae	<i>Melithreptus lunatus</i>	white-naped honeyeater		C		1
animals	birds	Meliphagidae	<i>Nesoptilotis leucotis</i>	white-eared honeyeater		C		12
animals	birds	Meliphagidae	<i>Philemon corniculatus</i>	noisy friarbird		C		50
animals	birds	Meliphagidae	<i>Manorina melanocephala</i>	noisy miner		C		29
animals	birds	Meliphagidae	<i>Philemon citreogularis</i>	little friarbird		C		46
animals	birds	Meropidae	<i>Merops ornatus</i>	rainbow bee-eater		C		33
animals	birds	Monarchidae	<i>Myiagra inquieta</i>	restless flycatcher		C		11
animals	birds	Monarchidae	<i>Myiagra rubecula</i>	leaden flycatcher		C		24
animals	birds	Monarchidae	<i>Myiagra cyanoleuca</i>	satin flycatcher		C		7
animals	birds	Monarchidae	<i>Grallina cyanoleuca</i>	magpie-lark		C		70
animals	birds	Motacillidae	<i>Anthus novaeseelandiae</i>	Australasian pipit		C		13
animals	birds	Nectariniidae	<i>Dicaeum hirundinaceum</i>	mistletoebird		C		42
animals	birds	Neosittidae	<i>Daphoenositta chrysoptera</i>	varied sittella		C		6
animals	birds	Oriolidae	<i>Oriolus sagittatus</i>	olive-backed oriole		C		25
animals	birds	Oriolidae	<i>Sphecotheres vieilloti</i>	Australasian figbird		C		7
animals	birds	Otididae	<i>Ardeotis australis</i>	Australian bustard		C		31
animals	birds	Pachycephalidae	<i>Colluricincla harmonica</i>	grey shrike-thrush		C		37
animals	birds	Pachycephalidae	<i>Pachycephala pectoralis</i>	golden whistler		C		10
animals	birds	Pachycephalidae	<i>Colluricincla megarrhyncha</i>	little shrike-thrush		C		1
animals	birds	Pachycephalidae	<i>Pachycephala rufiventris</i>	rufous whistler		C		91

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animals	birds	Pardalotidae	<i>Pardalotus striatus</i>	striated pardalote		C		96
animals	birds	Pardalotidae	<i>Pardalotus rubricatus</i>	red-browed pardalote		C		1
animals	birds	Pardalotidae	<i>Pardalotus punctatus</i>	spotted pardalote		C		1
animals	birds	Passeridae	<i>Passer domesticus</i>	house sparrow	Y			3
animals	birds	Pelecanidae	<i>Pelecanus conspicillatus</i>	Australian pelican		C		41
animals	birds	Petroicidae	<i>Eopsaltria australis</i>	eastern yellow robin		C		14
animals	birds	Petroicidae	<i>Petroica goodenovii</i>	red-capped robin		C		6
animals	birds	Petroicidae	<i>Microeca fascinans</i>	jacky winter		C		10
animals	birds	Phalacrocoracidae	<i>Phalacrocorax sulcirostris</i>	little black cormorant		C		40
animals	birds	Phalacrocoracidae	<i>Microcarbo melanoleucos</i>	little pied cormorant		C		30
animals	birds	Phalacrocoracidae	<i>Phalacrocorax varius</i>	pied cormorant		C		27
animals	birds	Phalacrocoracidae	<i>Phalacrocorax carbo</i>	great cormorant		C		18
animals	birds	Phasianidae	<i>Coturnix pectoralis</i>	stubble quail		C		6
animals	birds	Phasianidae	<i>Coturnix ypsilophora</i>	brown quail		C		9
animals	birds	Podargidae	<i>Podargus strigoides</i>	tawny frogmouth		C		12
animals	birds	Podicipedidae	<i>Poliocephalus poliocephalus</i>	hoary-headed grebe		C		2
animals	birds	Podicipedidae	<i>Podiceps cristatus</i>	great crested grebe		C		16
animals	birds	Podicipedidae	<i>Tachybaptus novaehollandiae</i>	Australasian grebe		C		47
animals	birds	Pomatostomidae	<i>Pomatostomus temporalis</i>	grey-crowned babbler		C		36
animals	birds	Psittacidae	<i>Trichoglossus haematodus moluccanus</i>	rainbow lorikeet		C		49
animals	birds	Psittacidae	<i>Aprosmictus erythropterus</i>	red-winged parrot		C		62
animals	birds	Psittacidae	<i>Trichoglossus chlorolepidotus</i>	scaly-breasted lorikeet		C		2
animals	birds	Psittacidae	<i>Alisterus scapularis</i>	Australian king-parrot		C		1
animals	birds	Psittacidae	<i>Platycercus adscitus</i>	pale-headed rosella		C		76
animals	birds	Psittacidae	<i>Melopsittacus undulatus</i>	budgerigar		C		2
animals	birds	Ptilonorhynchidae	<i>Ptilonorhynchus maculatus</i>	spotted bowerbird		C		43
animals	birds	Rallidae	<i>Fulica atra</i>	Eurasian coot		C		26
animals	birds	Rallidae	<i>Porzana pusilla</i>	Baillon's crane		C		2/2
animals	birds	Rallidae	<i>Tribonyx ventralis</i>	black-tailed native-hen		C		3
animals	birds	Rallidae	<i>Gallinula tenebrosa</i>	dusky moorhen		C		20
animals	birds	Rallidae	<i>Porphyrio porphyrio</i>	purple swamphen		C		9
animals	birds	Recurvirostridae	<i>Himantopus himantopus</i>	black-winged stilt		C		19
animals	birds	Recurvirostridae	<i>Recurvirostra novaehollandiae</i>	red-necked avocet		C		1
animals	birds	Rhipiduridae	<i>Rhipidura leucophrys</i>	willie wagtail		C		91
animals	birds	Rhipiduridae	<i>Rhipidura albiscapa</i>	grey fantail		C		80
animals	birds	Rhipiduridae	<i>Rhipidura rufifrons</i>	rufous fantail		C		1
animals	birds	Rostratulidae	<i>Rostratula australis</i>	Australian painted snipe		V	V	4
animals	birds	Scolopacidae	<i>Limosa lapponica</i>	bar-tailed godwit		C		1
animals	birds	Scolopacidae	<i>Tringa nebularia</i>	common greenshank		C		1
animals	birds	Scolopacidae	<i>Arenaria interpres</i>	ruddy turnstone		C		2
animals	birds	Scolopacidae	<i>Calidris acuminata</i>	sharp-tailed sandpiper		C		6
animals	birds	Scolopacidae	<i>Calidris ferruginea</i>	curlew sandpiper		C		2
animals	birds	Scolopacidae	<i>Calidris ruficollis</i>	red-necked stint		C		4
animals	birds	Strigidae	<i>Ninox boobook</i>	southern boobook		C		12
animals	birds	Strigidae	<i>Ninox connivens</i>	barking owl		C		2
animals	birds	Threskiornithidae	<i>Threskiornis molucca</i>	Australian white ibis		C		15

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animals	birds	Threskiornithidae	<i>Threskiornis spinicollis</i>	straw-necked ibis		C		18
animals	birds	Threskiornithidae	<i>Plegadis falcinellus</i>	glossy ibis		C		7
animals	birds	Threskiornithidae	<i>Platalea flavipes</i>	yellow-billed spoonbill		C		14
animals	birds	Threskiornithidae	<i>Platalea regia</i>	royal spoonbill		C		19
animals	birds	Timaliidae	<i>Zosterops lateralis</i>	silveryeye		C		10
animals	birds	Turnicidae	<i>Turnix pyrrhоторax</i>	red-chested button-quail		C		5
animals	birds	Turnicidae	<i>Turnix velox</i>	little button-quail		C		3
animals	birds	Tytonidae	<i>Tyto javanica</i>	eastern barn owl		C		14
animals	bony fish	Ambassidae	<i>Ambassis agassizii</i>	Agassiz's glassfish				3
animals	bony fish	Atherinidae	<i>Craterocephalus stercusmuscarum</i>	flyspecked hardyhead				3
animals	bony fish	Clupeidae	<i>Nematalosa erebi</i>	bony bream				3
animals	bony fish	Eleotridae	<i>Hypseleotris klunzingeri</i>	western carp gudgeon				3
animals	bony fish	Eleotridae	<i>Philypnodon grandiceps</i>	flathead gudgeon				2
animals	bony fish	Eleotridae	<i>Hypseleotris species 1</i>	Midgley's carp gudgeon				1
animals	bony fish	Eleotridae	<i>Oxyeleotris lineolata</i>	sleepy cod				2
animals	bony fish	Melanotaeniidae	<i>Melanotaenia splendida splendida</i>	eastern rainbowfish				3
animals	bony fish	Osteoglossidae	<i>Scleropages leichardti</i>	southern saratoga				2
animals	bony fish	Percichthyidae	<i>Maccullochella peelii</i>	Murray cod			V	1
animals	bony fish	Percichthyidae	<i>Macquaria ambigua</i>	golden perch				4/1
animals	bony fish	Plotosidae	<i>Tandanus tandanus</i>	freshwater catfish				3
animals	bony fish	Plotosidae	<i>Neosilurus hyrtl</i>	Hyrtl's catfish				2
animals	bony fish	Terapontidae	<i>Scortum hillii</i>	leathery grunter				3
animals	bony fish	Terapontidae	<i>Leiopotherapon unicolor</i>	spangled perch				2
animals	bony fish	Terapontidae	<i>Amniataba percoides</i>	barred grunter				1
animals	bony fish	Terapontidae	<i>Bidyanus bidyanus</i>	silver perch				1
animals	insects	Nymphalidae	<i>Euploea core corinna</i>	common crow				1
animals	mammals	Canidae	<i>Canis lupus dingo</i>	dingo				2
animals	mammals	Canidae	<i>Vulpes vulpes</i>	red fox	Y			1
animals	mammals	Dasyuridae	<i>Dasyurus hallucatus</i>	northern quoll		C	E	2
animals	mammals	Dasyuridae	<i>Sminthopsis macroura</i>	stripe-faced dunnart		C		1/1
animals	mammals	Dasyuridae	<i>Planigale maculata</i>	common planigale		C		2
animals	mammals	Dasyuridae	<i>Planigale ingrami</i>	long-tailed planigale		C		1/1
animals	mammals	Emballonuridae	<i>Taphozous troughtoni</i>	Troughton's sheath-tail bat		C		471
animals	mammals	Emballonuridae	<i>Saccolaimus flaviventris</i>	yellow-bellied sheath-tail bat		C		3
animals	mammals	Felidae	<i>Felis catus</i>	cat	Y			10
animals	mammals	Leporidae	<i>Oryctolagus cuniculus</i>	rabbit	Y			7
animals	mammals	Macropodidae	<i>Lagorchestes conspicillatus</i>	spectacled hare-wallaby		C		8
animals	mammals	Macropodidae	<i>Onychogalea fraenata</i>	bridled nailtail wallaby		E	E	1
animals	mammals	Macropodidae	<i>Petrogale herberti</i>	Herbert's rock-wallaby		C		2
animals	mammals	Macropodidae	<i>Macropus giganteus</i>	eastern grey kangaroo		C		12
animals	mammals	Macropodidae	<i>Macropus robustus</i>	common wallaroo		C		9
animals	mammals	Macropodidae	<i>Macropus dorsalis</i>	black-striped wallaby		C		4
animals	mammals	Macropodidae	<i>Wallabia bicolor</i>	swamp wallaby		C		9
animals	mammals	Molossidae	<i>Mormopterus sp.</i>					1/1
animals	mammals	Molossidae	<i>Tadarida australis</i>	white-striped freetail bat		C		1
animals	mammals	Molossidae	<i>Mormopterus beccarii</i>	Beccari's freetail bat		C		1/1

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animals	mammals	Molossidae	<i>Mormopterus planiceps</i>	southern freetail bat		C		1
animals	mammals	Muridae	<i>Pseudomys gracilicaudatus</i>	eastern chestnut mouse		C		8/1
animals	mammals	Muridae	<i>Rattus sp. cf. villosissimus/sordidus</i>			C		4
animals	mammals	Muridae	<i>Pseudomys delicatulus</i>	delicate mouse		C		9/1
animals	mammals	Muridae	<i>Hydromys chrysogaster</i>	water rat		C		1
animals	mammals	Muridae	<i>Pseudomys desertor</i>	desert mouse		C		3
animals	mammals	Muridae	<i>Rattus tunneyi</i>	pale field-rat		C		4/1
animals	mammals	Muridae	<i>Leggadina forresti</i>	Forrest's mouse		C		1
animals	mammals	Muridae	<i>Mus musculus</i>	house mouse	Y			22
animals	mammals	Peramelidae	<i>Isodon macrourus</i>	northern brown bandicoot		C		2
animals	mammals	Peramelidae	<i>Perameles nasuta</i>	long-nosed bandicoot		C		1/1
animals	mammals	Petauridae	<i>Petaurus breviceps</i>	sugar glider		C		2
animals	mammals	Phalangeridae	<i>Trichosurus vulpecula</i>	common brushtail possum		C		12
animals	mammals	Phascolarctidae	<i>Phascolarctos cinereus</i>	koala		C	V	22
animals	mammals	Potoroidae	<i>Aepyprymnus rufescens</i>	rufous bettong		C		5
animals	mammals	Pteropodidae	<i>Pteropus scapulatus</i>	little red flying-fox		C		5
animals	mammals	Suidae	<i>Sus scrofa</i>	pig	Y			3
animals	mammals	Tachyglossidae	<i>Tachyglossus aculeatus</i>	short-beaked echidna		C		14
animals	mammals	Vespertilionidae	<i>Chalinolobus picatus</i>	little pied bat		NT		1
animals	mammals	Vespertilionidae	<i>Chalinolobus gouldii</i>	Gould's wattled bat		C		3/2
animals	mammals	Vespertilionidae	<i>Vespadelus pumilus</i>	eastern forest bat		C		2/1
animals	mammals	Vespertilionidae	<i>Scotorepens balstoni</i>	inland broad-nosed bat		C		1
animals	mammals	Vespertilionidae	<i>Nyctophilus gouldi</i>	Gould's long-eared bat		C		1/1
animals	mammals	Vespertilionidae	<i>Scotorepens greyii</i>	little broad-nosed bat		C		1
animals	mammals	Vespertilionidae	<i>Miniopterus schreibersii oceanensis</i>	eastern bent-wing bat		C		1/1
animals	reptiles	Agamidae	<i>Amphibolurus nobbi</i>			C		1/1
animals	reptiles	Agamidae	<i>Pogona barbata</i>	bearded dragon		C		1
animals	reptiles	Agamidae	<i>Amphibolurus gilberti</i>	Gilbert's dragon		C		3/2
animals	reptiles	Boidae	<i>Antaresia maculosa</i>	spotted python		C		2
animals	reptiles	Boidae	<i>Aspidites melanocephalus</i>	black-headed python		C		3/1
animals	reptiles	Carphodactylidae	<i>Nephrurus asper</i>	spiny knob-tailed gecko		C		3
animals	reptiles	Chelidae	<i>Emydura macquarii krefftii</i>	Krefft's river turtle		C		5/1
animals	reptiles	Chelidae	<i>Chelodina expansa</i>	broad-shelled river turtle		C		1
animals	reptiles	Chelidae	<i>Chelodina longicollis</i>	eastern snake-necked turtle		C		2
animals	reptiles	Colubridae	<i>Dendrelaphis punctulata</i>	common tree snake		C		2
animals	reptiles	Colubridae	<i>Tropidonophis mairii</i>	freshwater snake		C		1/1
animals	reptiles	Diplodactylidae	<i>Diplodactylus conspicillatus</i>	fat-tailed diplodactylus		C		1
animals	reptiles	Diplodactylidae	<i>Lucasium steindachneri</i>	Steindachner's gecko		C		3/1
animals	reptiles	Diplodactylidae	<i>Diplodactylus vittatus</i>	wood gecko		C		3/1
animals	reptiles	Diplodactylidae	<i>Strophurus taenicauda</i>	golden-tailed gecko		NT		4
animals	reptiles	Diplodactylidae	<i>Oedura marmorata</i>	marbled velvet gecko		C		1/1
animals	reptiles	Diplodactylidae	<i>Oedura monillis</i>			C		6/3
animals	reptiles	Elapidae	<i>Furina diadema</i>	red-naped snake		C		2/2
animals	reptiles	Elapidae	<i>Suta suta</i>	myall snake		C		3/1
animals	reptiles	Elapidae	<i>Denisonia maculata</i>	ornamental snake		V	V	2/1
animals	reptiles	Elapidae	<i>Cryptophis boschmai</i>	Carpentaria whip snake		C		4/2

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animals	reptiles	Elapidae	<i>Demansia psammophis</i>	yellow-faced whip snake		C		4
animals	reptiles	Elapidae	<i>Pseudonaja textilis</i>	eastern brown snake		C		6
animals	reptiles	Elapidae	<i>Vermicella annulata</i>	bandy-bandy		C		2/1
animals	reptiles	Elapidae	<i>Pseudechis australis</i>	king brown snake		C		4
animals	reptiles	Elapidae	<i>Acanthophis antarcticus</i>	common death adder		NT		2
animals	reptiles	Elapidae	<i>Brachyuropsis australis</i>	coral snake		C		1
animals	reptiles	Elapidae	<i>Hoplocephalus bitorquatus</i>	pale-headed snake		C		4/3
animals	reptiles	Elapidae	<i>Hemiaspis damelii</i>	grey snake		E		1
animals	reptiles	Gekkonidae	<i>Gehyra catenata</i>			C		1
animals	reptiles	Gekkonidae	<i>Gehyra dubia</i>			C		3/1
animals	reptiles	Gekkonidae	<i>Heteronotia binoei</i>	Bynoe's gecko		C		10/3
animals	reptiles	Gekkonidae	<i>Gehyra variegata</i>	tree dtella		C		1
animals	reptiles	Pygopodidae	<i>Pygopus schraderi</i>			C		1/1
animals	reptiles	Pygopodidae	<i>Lialis burtonis</i>	Burton's legless lizard		C		4/1
animals	reptiles	Pygopodidae	<i>Delma tincta</i>			C		1/1
animals	reptiles	Scincidae	<i>Ctenotus strauchii</i>			C		2/1
animals	reptiles	Scincidae	<i>Carlia pectoralis</i>			C		8/4
animals	reptiles	Scincidae	<i>Lygisaurus foliorum</i>			C		1
animals	reptiles	Scincidae	<i>Morethia boulengeri</i>			C		6/1
animals	reptiles	Scincidae	<i>Ctenotus taeniolatus</i>	copper-tailed skink		C		4/1
animals	reptiles	Scincidae	<i>Lampropholis delicata</i>			C		1
animals	reptiles	Scincidae	<i>Morethia taeniopleura</i>	fire-tailed skink		C		1
animals	reptiles	Scincidae	<i>Tiliqua rugosa aspera</i>	shingle-back (eastern subspecies)		C		2
animals	reptiles	Scincidae	<i>Lerista punctatovittata</i>			C		2/1
animals	reptiles	Scincidae	<i>Cryptoblepharus pannosus</i>	ragged snake-eyed skink		C		5/2
animals	reptiles	Scincidae	<i>Eremiascincus fasciolatus</i>	narrow-banded sand swimmer		C		2
animals	reptiles	Scincidae	<i>Tiliqua scincoides</i>	eastern blue-tongued lizard		C		8/1
animals	reptiles	Scincidae	<i>Ctenotus robustus</i>			C		5/1
animals	reptiles	Scincidae	<i>Egernia striolata</i>	tree skink		C		2
animals	reptiles	Scincidae	<i>Carlia munda</i>			C		2
animals	reptiles	Scincidae	<i>Menetia greyii</i>			C		3/1
animals	reptiles	Scincidae	<i>Lerista fragilis</i>			C		5/2
animals	reptiles	Scincidae	<i>Ctenotus ingrami</i>			C		1/1
animals	reptiles	Scincidae	<i>Menetia timlowi</i>			C		2
animals	reptiles	Typhlopidae	<i>Ramphotyphlops ligatus</i>			C		1/1
animals	reptiles	Typhlopidae	<i>Ramphotyphlops sp.</i>					1
animals	reptiles	Varanidae	<i>Varanus tristis</i>	black-tailed monitor		C		3
animals	reptiles	Varanidae	<i>Varanus gouldii</i>	sand monitor		C		9/1
animals	reptiles	Varanidae	<i>Varanus varius</i>	lace monitor		C		1
plants	conifers	Cupressaceae	<i>Callitris columellaris</i>			C		1
plants	conifers	Cupressaceae	<i>Callitris</i>			C		1
plants	conifers	Cupressaceae	<i>Callitris glaucophylla</i>	white cypress pine		C		1/1
plants	ferns	Adiantaceae	<i>Pellaea nana</i>			C		1/1
plants	ferns	Adiantaceae	<i>Adiantum hispidulum var. hypoglaucum</i>			C		1/1
plants	ferns	Adiantaceae	<i>Cheilanthes sieberi subsp. sieberi</i>			C		1/1
plants	ferns	Adiantaceae	<i>Cheilanthes sieberi</i>			C		11

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plants	ferns	Adiantaceae	<i>Cheilanthes distans</i>	bristly cloak fern		C		1/1
plants	ferns	Blechnaceae	<i>Doodia caudata</i>			C		1/1
plants	ferns	Marsileaceae	<i>Marsilea hirsuta</i>	hairy nardoo		C		1
plants	ferns	Marsileaceae	<i>Marsilea drummondii</i>	common nardoo		C		1
plants	higher dicots	Acanthaceae	<i>Pseuderanthemum variabile</i>	pastel flower		C		3/1
plants	higher dicots	Acanthaceae	<i>Rostellularia adscendens</i>			C		4
plants	higher dicots	Acanthaceae	<i>Brunoniella australis</i>	blue trumpet		C		2
plants	higher dicots	Aizoaceae	<i>Trianthema triquetra</i>	red spinach		C		1
plants	higher dicots	Amaranthaceae	<i>Alternanthera denticulata</i>	lesser joyweed		C		2/1
plants	higher dicots	Amaranthaceae	<i>Alternanthera nodiflora</i>	joyweed		C		1/1
plants	higher dicots	Amaranthaceae	<i>Achyranthes aspera</i>			C		3
plants	higher dicots	Amaranthaceae	<i>Nyssanthes erecta</i>			C		2/1
plants	higher dicots	Amaranthaceae	<i>Guilleminea densa</i>	small matweed	Y			1/1
plants	higher dicots	Anacardiaceae	<i>Schinus terebinthifolius</i>		Y			1/1
plants	higher dicots	Apiaceae	<i>Eryngium plantagineum</i>	long eryngium		C		1/1
plants	higher dicots	Apocynaceae	<i>Parsonsia eucalyptophylla</i>	gargaloo		C		4/1
plants	higher dicots	Apocynaceae	<i>Sarcostemma viminale subsp. australe</i>			C		1
plants	higher dicots	Apocynaceae	<i>Parsonsia lanceolata</i>	northern silkpod		C		4/1
plants	higher dicots	Apocynaceae	<i>Marsdenia microlepis</i>			C		1/1
plants	higher dicots	Apocynaceae	<i>Marsdenia brevifolia</i>			V	V	1/1
plants	higher dicots	Apocynaceae	<i>Parsonsia straminea</i>	monkey rope		C		2
plants	higher dicots	Apocynaceae	<i>Alstonia constricta</i>	bitterbark		C		9/1
plants	higher dicots	Apocynaceae	<i>Secamone elliptica</i>			C		2
plants	higher dicots	Apocynaceae	<i>Carissa lanceolata</i>			C		1
plants	higher dicots	Apocynaceae	<i>Alyxia ruscifolia</i>			C		3/3
plants	higher dicots	Apocynaceae	<i>Carissa ovata</i>	currantbush		C		16/1
plants	higher dicots	Apocynaceae	<i>Parsonsia</i>			C		1
plants	higher dicots	Apocynaceae	<i>Marsdenia</i>			C		1
plants	higher dicots	Asteraceae	<i>Peripleura hispidula var. hispidula</i>			C		1/1
plants	higher dicots	Asteraceae	<i>Vittadinia dissecta</i>			C		1
plants	higher dicots	Asteraceae	<i>Pterocaulon serrulatum var. serrulatum</i>			C		1/1
plants	higher dicots	Asteraceae	<i>Euchiton sphaericus</i>			C		1
plants	higher dicots	Asteraceae	<i>Asteraceae</i>			C		1
plants	higher dicots	Asteraceae	<i>Cassinia laevis</i>			C		2
plants	higher dicots	Asteraceae	<i>Olearia canescens</i>			C		2/2
plants	higher dicots	Asteraceae	<i>Sonchus oleraceus</i>	common sowthistle	Y			1/1
plants	higher dicots	Asteraceae	<i>Tridax procumbens</i>	tridax daisy	Y			2/2
plants	higher dicots	Asteraceae	<i>Calotis cuneifolia</i>	burr daisy		C		4/1
plants	higher dicots	Asteraceae	<i>Centipeda racemosa</i>	snuffweed		C		1/1
plants	higher dicots	Asteraceae	<i>Conyza bonariensis</i>		Y			2/2
plants	higher dicots	Asteraceae	<i>Cymbonotus maidenii</i>			E		1/1
plants	higher dicots	Asteraceae	<i>Vittadinia dissecta var. dissecta</i>			C		1/1
plants	higher dicots	Asteraceae	<i>Crassocephalum crepidioides</i>	thickhead	Y			1/1
plants	higher dicots	Asteraceae	<i>Parthenium hysterophorus</i>	parthenium weed	Y			3/1
plants	higher dicots	Asteraceae	<i>Ozothamnus cassinioides</i>			C		1/1
plants	higher dicots	Asteraceae	<i>Pterocaulon serrulatum</i>			C		4

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plants	higher dicots	Asteraceae	<i>Wedelia spilanthis</i>			C		1
plants	higher dicots	Asteraceae	<i>Verbesina encelioides</i>	crownbeard	Y			2/1
plants	higher dicots	Asteraceae	<i>Leiocarpa brevicompta</i>			C		2/2
plants	higher dicots	Asteraceae	<i>Cyanthillium cinereum</i>			C		7
plants	higher dicots	Asteraceae	<i>Pterocaulon redolens</i>			C		3/1
plants	higher dicots	Asteraceae	<i>Peripleura hispidula</i>			C		1
plants	higher dicots	Asteraceae	<i>Acmella grandiflora</i> var. <i>brachyglossa</i>			C		1
plants	higher dicots	Bignoniaceae	<i>Pandorea pandorana</i>	wonga vine		C		4/2
plants	higher dicots	Boraginaceae	<i>Ehretia membranifolia</i>	weeping koda		C		1
plants	higher dicots	Brassicaceae	<i>Sisymbrium thellungii</i>	African turnip-weed	Y			1/1
plants	higher dicots	Cactaceae	<i>Opuntia stricta</i>		Y			2
plants	higher dicots	Cactaceae	<i>Opuntia</i>		Y			2
plants	higher dicots	Cactaceae	<i>Opuntia tomentosa</i>	velvety tree pear	Y			6
plants	higher dicots	Caesalpiniaceae	<i>Lysiphyllum hookeri</i>	Queensland ebony		C		4
plants	higher dicots	Caesalpiniaceae	<i>Senna artemisioides</i> subsp. <i>coriacea</i>			C		1
plants	higher dicots	Caesalpiniaceae	<i>Parkinsonia aculeata</i>	Jerusalem thorn	Y			3/1
plants	higher dicots	Caesalpiniaceae	<i>Lysiphyllum carronii</i>	ebony tree		C		4
plants	higher dicots	Caesalpiniaceae	<i>Senna barclayana</i>			C		2
plants	higher dicots	Caesalpiniaceae	<i>Cassia brewsteri</i>			C		3
plants	higher dicots	Campanulaceae	<i>Wahlenbergia islensis</i>			NT		2/1
plants	higher dicots	Capparaceae	<i>Capparis mitchellii</i>			C		1
plants	higher dicots	Capparaceae	<i>Apophyllum anomalum</i>	broom bush		C		4/1
plants	higher dicots	Capparaceae	<i>Capparis lasiantha</i>	nipan		C		9/1
plants	higher dicots	Capparaceae	<i>Capparis loranthifolia</i> var. <i>loranthifolia</i>			C		1/1
plants	higher dicots	Capparaceae	<i>Capparis arborea</i>	brush caper berry		C		1
plants	higher dicots	Capparaceae	<i>Capparis</i>			C		1
plants	higher dicots	Capparaceae	<i>Capparis loranthifolia</i>			C		1
plants	higher dicots	Capparaceae	<i>Capparis canescens</i>			C		1
plants	higher dicots	Casuarinaceae	<i>Casuarina cunninghamiana</i>			C		2
plants	higher dicots	Casuarinaceae	<i>Casuarina cristata</i>	belah		C		2
plants	higher dicots	Celastraceae	<i>Maytenus cunninghamii</i>	yellow berry bush		C		1
plants	higher dicots	Celastraceae	<i>Elaeodendron australe</i>			C		1
plants	higher dicots	Celastraceae	<i>Denhamia pittosporoides</i>			C		1
plants	higher dicots	Celastraceae	<i>Denhamia oleaster</i>			C		2
plants	higher dicots	Chenopodiaceae	<i>Einadia</i>			C		1
plants	higher dicots	Chenopodiaceae	<i>Atriplex</i>			C		3
plants	higher dicots	Chenopodiaceae	<i>Sclerolaena</i>			C		1
plants	higher dicots	Chenopodiaceae	<i>Dysphania glomulifera</i> subsp. <i>glomulifera</i>			C		1
plants	higher dicots	Chenopodiaceae	<i>Sclerolaena muricata</i> var. <i>muricata</i>			C		1
plants	higher dicots	Chenopodiaceae	<i>Sclerolaena muricata</i> var. <i>villosa</i>			C		2/2
plants	higher dicots	Chenopodiaceae	<i>Sclerolaena bicornis</i> var. <i>horrida</i>			C		1
plants	higher dicots	Chenopodiaceae	<i>Sclerolaena calcarata</i>	red burr		C		1
plants	higher dicots	Chenopodiaceae	<i>Salsola kali</i>			C		1
plants	higher dicots	Chenopodiaceae	<i>Maireana microphylla</i>			C		1
plants	higher dicots	Chenopodiaceae	<i>Chenopodium carinatum</i>	green crumbweed		C		1/1
plants	higher dicots	Chenopodiaceae	<i>Einadia hastata</i>			C		1

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plants	higher dicots	Chenopodiaceae	<i>Atriplex muelleri</i>	lagoon saltbush		C		1/1
plants	higher dicots	Chenopodiaceae	<i>Atriplex nummularia</i>			C		1
plants	higher dicots	Chenopodiaceae	<i>Sclerolaena birchii</i>	galvanised burr		C		1
plants	higher dicots	Chenopodiaceae	<i>Enchylaena tomentosa</i>			C		3
plants	higher dicots	Combretaceae	<i>Macropteranthus leichhardtii</i>	bonewood		C		2
plants	higher dicots	Combretaceae	<i>Terminalia oblongata</i>			C		7
plants	higher dicots	Convolvulaceae	<i>Ipomoea plebeia</i>	bellvine		C		1/1
plants	higher dicots	Convolvulaceae	<i>Polymeria pusilla</i>			C		2/2
plants	higher dicots	Convolvulaceae	<i>Evolvulus alsinoides</i>			C		1
plants	higher dicots	Convolvulaceae	<i>Ipomoea lonchophylla</i>			C		2/1
plants	higher dicots	Convolvulaceae	<i>Evolvulus alsinoides</i> var. <i>decumbens</i>			C		1/1
plants	higher dicots	Ebenaceae	<i>Diospyros humilis</i>	small-leaved ebony		C		3/1
plants	higher dicots	Erythroxylaceae	<i>Erythroxylum australe</i>	cocaine tree		C		6/2
plants	higher dicots	Erythroxylaceae	<i>Erythroxylum</i> sp. (Splityard Creek L.Pedley 5360)			C		9
plants	higher dicots	Euphorbiaceae	<i>Croton insularis</i>	Queensland cascarilla		C		1
plants	higher dicots	Euphorbiaceae	<i>Acalypha eremorum</i>	soft acalypha		C		1
plants	higher dicots	Euphorbiaceae	<i>Acalypha australis</i>		Y			1/1
plants	higher dicots	Euphorbiaceae	<i>Euphorbia stevenii</i>	bottle tree spurge		C		1/1
plants	higher dicots	Euphorbiaceae	<i>Croton phebaloides</i>	narrow-leaved croton		C		2
plants	higher dicots	Euphorbiaceae	<i>Bertya opposens</i>			C	V	4/2
plants	higher dicots	Euphorbiaceae	<i>Euphorbia hyssopifolia</i>		Y			1/1
plants	higher dicots	Euphorbiaceae	<i>Euphorbia coghlanii</i>			C		2/2
plants	higher dicots	Euphorbiaceae	<i>Beyeria viscosa</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Desmodium</i>			C		2
plants	higher dicots	Fabaceae	<i>Indigofera</i> sp. (Aramac E.J.Thompson+ JER177)			C		1/1
plants	higher dicots	Fabaceae	<i>Hovea longipes</i>	brush hovea		C		1
plants	higher dicots	Fabaceae	<i>Glycine falcata</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Lotus australis</i>	Australian trefoil		C		1/1
plants	higher dicots	Fabaceae	<i>Vigna suberecta</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Desmodium gunnii</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Hovea lanceolata</i>			C		2
plants	higher dicots	Fabaceae	<i>Hovea parvicalyx</i>			C		4/4
plants	higher dicots	Fabaceae	<i>Tephrosia rufula</i>			C		1
plants	higher dicots	Fabaceae	<i>Glycine cyrtoloba</i>			C		2
plants	higher dicots	Fabaceae	<i>Glycine tomentella</i>	woolly glycine		C		1
plants	higher dicots	Fabaceae	<i>Stylosanthes scabra</i>		Y			2
plants	higher dicots	Fabaceae	<i>Desmodium brachypodium</i>	large ticktrefoil		C		1
plants	higher dicots	Fabaceae	<i>Crotalaria medicaginea</i>	trefoil rattlepod		C		1
plants	higher dicots	Fabaceae	<i>Vigna radiata</i> var. <i>sublobata</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Galactia tenuiflora</i> var. <i>lucida</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Rhynchosia minima</i> var. <i>australis</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Tephrosia filipes</i> subsp. <i>filipes</i>			C		1
plants	higher dicots	Fabaceae	<i>Zornia muriculata</i> subsp. <i>angustata</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Indigofera</i>			C		1
plants	higher dicots	Goodeniaceae	<i>Goodenia</i>			C		1/1
plants	higher dicots	Goodeniaceae	<i>Goodenia fascicularis</i>			C		1/1

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plants	higher dicots	Goodeniaceae	<i>Goodenia grandiflora</i>			C		3/1
plants	higher dicots	Goodeniaceae	<i>Brunonia australis</i>	blue pincushion		C		1
plants	higher dicots	Haloragaceae	<i>Haloragis aspera</i>	raspweed		C		2/1
plants	higher dicots	Lamiaceae	<i>Clerodendrum floribundum</i>			C		2/1
plants	higher dicots	Lamiaceae	<i>Teucrium integrifolium</i>			C		3/2
plants	higher dicots	Lamiaceae	<i>Basilicum polystachyon</i>			C		1/1
plants	higher dicots	Lamiaceae	<i>Anisomeles malabarica</i>			C		1/1
plants	higher dicots	Lamiaceae	<i>Plectranthus parviflorus</i>			C		1
plants	higher dicots	Loganiaceae	<i>Mitrasacme pygmaea</i>			C		1/1
plants	higher dicots	Loranthaceae	<i>Amyema quandang var. quandang</i>			C		2/1
plants	higher dicots	Loranthaceae	<i>Dendrophthoe glabrescens</i>			C		1
plants	higher dicots	Loranthaceae	<i>Lysiana subfalcata</i>			C		1/1
plants	higher dicots	Loranthaceae	<i>Amyema maidenii</i>			C		1
plants	higher dicots	Loranthaceae	<i>Amyema quandang var. bancroftii</i>	broad-leaved grey mistletoe		C		1/1
plants	higher dicots	Malvaceae	<i>Abutilon oxycarpum</i>			C		1
plants	higher dicots	Malvaceae	<i>Abutilon tubulosum</i>			C		1
plants	higher dicots	Malvaceae	<i>Hibiscus verdcourtii</i>			C		2/2
plants	higher dicots	Malvaceae	<i>Abelmoschus ficulneus</i>	native rosella		C		1/1
plants	higher dicots	Malvaceae	<i>Hibiscus krichauffianus</i>			C		4/1
plants	higher dicots	Malvaceae	<i>Abutilon oxycarpum var. incanum</i>			C		1/1
plants	higher dicots	Malvaceae	<i>Abutilon oxycarpum var. oxycarpum</i>			C		3/2
plants	higher dicots	Malvaceae	<i>Hibiscus sturtii var. campyloclamys</i>			C		2/1
plants	higher dicots	Malvaceae	<i>Malvastrum americanum var. americanum</i>		Y			3
plants	higher dicots	Malvaceae	<i>Hibiscus sp. (Emerald S.L.Everist 2124)</i>			C		1
plants	higher dicots	Malvaceae	<i>Sida</i>			C		6
plants	higher dicots	Malvaceae	<i>Abutilon</i>			C		1
plants	higher dicots	Malvaceae	<i>Hibiscus</i>			C		4/1
plants	higher dicots	Malvaceae	<i>Malvaceae</i>			C		1/1
plants	higher dicots	Malvaceae	<i>Sida spinosa</i>	spiny sida	Y			1/1
plants	higher dicots	Malvaceae	<i>Sida pleiantha</i>			C		1/1
plants	higher dicots	Malvaceae	<i>Abutilon nobile</i>			C		1/1
plants	higher dicots	Malvaceae	<i>Sida cordifolia</i>		Y			1
plants	higher dicots	Malvaceae	<i>Sida fibulifera</i>			C		1/1
plants	higher dicots	Malvaceae	<i>Sida filiformis</i>			C		8
plants	higher dicots	Malvaceae	<i>Sida trichopoda</i>			C		1
plants	higher dicots	Malvaceae	<i>Abutilon auritum</i>	Chinese lantern		C		1
plants	higher dicots	Malvaceae	<i>Hibiscus sturtii</i>			C		5
plants	higher dicots	Malvaceae	<i>Sida atherophora</i>			C		6/1
plants	higher dicots	Malvaceae	<i>Abutilon guineense</i>			C		1/1
plants	higher dicots	Meliaceae	<i>Owenia acidula</i>	emu apple		C		3/2
plants	higher dicots	Meliaceae	<i>Melia azedarach</i>	white cedar		C		1
plants	higher dicots	Meliaceae	<i>Turraea pubescens</i>	native honeysuckle		C		1/1
plants	higher dicots	Mimosaceae	<i>Acacia burrowii</i>			C		1
plants	higher dicots	Mimosaceae	<i>Acacia oswaldii</i>	miljee		C		1
plants	higher dicots	Mimosaceae	<i>Acacia salicina</i>	doolan		C		7/3
plants	higher dicots	Mimosaceae	<i>Acacia shirleyi</i>	lancewood		C		10/1

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plants	higher dicots	Mimosaceae	<i>Acacia fodinalis</i>			C		3
plants	higher dicots	Mimosaceae	<i>Acacia leiocalyx</i>			C		1
plants	higher dicots	Mimosaceae	<i>Acacia victoriae</i>			C		3/3
plants	higher dicots	Mimosaceae	<i>Acacia catenulata</i>	bendee		C		3/1
plants	higher dicots	Mimosaceae	<i>Acacia farnesiana</i>	mimosa bush		C		1
plants	higher dicots	Mimosaceae	<i>Acacia harpophylla</i>	brigalow		C		9
plants	higher dicots	Mimosaceae	<i>Acacia holosericea</i>			C		1
plants	higher dicots	Mimosaceae	<i>Acacia leptostachya</i>	Townsville wattle		C		1
plants	higher dicots	Mimosaceae	<i>Acacia longispicata</i>			C		2/2
plants	higher dicots	Mimosaceae	<i>Acacia bancroftiorum</i>			C		2
plants	higher dicots	Mimosaceae	<i>Acacia fasciculifera</i>	scaly bark		C		1
plants	higher dicots	Mimosaceae	<i>Archidendropsis basaltica</i>	red lancewood		C		2
plants	higher dicots	Mimosaceae	<i>Acacia cretata</i> x <i>A.fodinalis</i>			C		1/1
plants	higher dicots	Mimosaceae	<i>Acacia excelsa</i> subsp. <i>excelsa</i>			C		1/1
plants	higher dicots	Mimosaceae	<i>Acacia</i> sp. (Comet L.Pedley 4091)			C		1/1
plants	higher dicots	Mimosaceae	<i>Neptunia gracilis</i> forma <i>gracilis</i>			C		2/1
plants	higher dicots	Mimosaceae	<i>Acacia excelsa</i>			C		3
plants	higher dicots	Mimosaceae	<i>Acacia angusta</i>			C		2/2
plants	higher dicots	Mimosaceae	<i>Acacia decora</i>	pretty wattle		C		1
plants	higher dicots	Mimosaceae	<i>Acacia</i>			C		1
plants	higher dicots	Molluginaceae	<i>Glinus lotoides</i>	hairy carpet weed		C		1/1
plants	higher dicots	Moraceae	<i>Ficus opposita</i>			C		2/2
plants	higher dicots	Moraceae	<i>Ficus virens</i> var. <i>sublanceolata</i>			C		2/2
plants	higher dicots	Moraceae	<i>Ficus rubiginosa</i> forma <i>rubiginosa</i>			C		1/1
plants	higher dicots	Moraceae	<i>Ficus</i>			C		1
plants	higher dicots	Moraceae	<i>Ficus coronata</i>	creek sandpaper fig		C		1
plants	higher dicots	Myoporaceae	<i>Myoporum acuminatum</i>	coastal boobialla		C		4
plants	higher dicots	Myoporaceae	<i>Eremophila maculata</i>			C		1
plants	higher dicots	Myoporaceae	<i>Eremophila debilis</i>	winter apple		C		1/1
plants	higher dicots	Myoporaceae	<i>Eremophila mitchellii</i>			C		15
plants	higher dicots	Myoporaceae	<i>Eremophila longifolia</i>	berrigan		C		1/1
plants	higher dicots	Myrtaceae	<i>Corymbia terminalis</i>			C		1
plants	higher dicots	Myrtaceae	<i>Eucalyptus coolabah</i>	coolabah		C		3/1
plants	higher dicots	Myrtaceae	<i>Eucalyptus populnea</i>	poplar box		C		8/1
plants	higher dicots	Myrtaceae	<i>Melaleuca bracteata</i>			C		2
plants	higher dicots	Myrtaceae	<i>Corymbia dallachiana</i>			C		6/1
plants	higher dicots	Myrtaceae	<i>Corymbia hendersonii</i>			C		2/1
plants	higher dicots	Myrtaceae	<i>Corymbia trachyphloia</i> subsp. <i>trachyphloia</i>			C		1/1
plants	higher dicots	Myrtaceae	<i>Corymbia clarksoniana</i>			C		2
plants	higher dicots	Myrtaceae	<i>Corymbia lamprophylla</i>			C		1
plants	higher dicots	Myrtaceae	<i>Corymbia leichhardtii</i>	rustyjacket		C		4/2
plants	higher dicots	Myrtaceae	<i>Eucalyptus cambageana</i>	Dawson gum		C		8/1
plants	higher dicots	Myrtaceae	<i>Eucalyptus microtheca</i>	coolibah		C		2
plants	higher dicots	Myrtaceae	<i>Eucalyptus thozetiana</i>			C		3
plants	higher dicots	Myrtaceae	<i>Corymbia erythrophloia</i>	variable-barked bloodwood		C		6/4
plants	higher dicots	Myrtaceae	<i>Eucalyptus orgadophila</i>	mountain coolibah		C		4/1

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plants	higher dicots	Myrtaceae	<i>Eucalyptus sicilifolia</i>			V		8/8
plants	higher dicots	Myrtaceae	<i>Eucalyptus tholiformis</i>			C		1/1
plants	higher dicots	Myrtaceae	<i>Eucalyptus melanophloia</i>			C		9
plants	higher dicots	Myrtaceae	<i>Eucalyptus tereticornis</i>			C		2
plants	higher dicots	Myrtaceae	<i>Leptospermum lamellatum</i>			C		2/1
plants	higher dicots	Myrtaceae	<i>Eucalyptus camaldulensis</i>			C		1
plants	higher dicots	Myrtaceae	<i>Eucalyptus drepanophylla</i>			C		1
plants	higher dicots	Myrtaceae	<i>Eucalyptus crebra</i> x <i>E.melanophloia</i>			C		1/1
plants	higher dicots	Myrtaceae	<i>Corymbia citriodora</i>	spotted gum		C		3
plants	higher dicots	Myrtaceae	<i>Eucalyptus exserta</i>	Queensland peppermint		C		1/1
plants	higher dicots	Myrtaceae	<i>Corymbia polycarpa</i>	long-fruited bloodwood		C		1
plants	higher dicots	Myrtaceae	<i>Melaleuca nervosa</i>			C		1/1
plants	higher dicots	Myrtaceae	<i>Eucalyptus crebra</i>	narrow-leaved red ironbark		C		8/3
plants	higher dicots	Myrtaceae	<i>Corymbia tessellaris</i>	Moreton Bay ash		C		3
plants	higher dicots	Oleaceae	<i>Ximenia americana</i>			C		1/1
plants	higher dicots	Oleaceae	<i>Jasminum didymum</i>			C		1
plants	higher dicots	Oleaceae	<i>Notelaea microcarpa</i> var. <i>microcarpa</i>			C		3/3
plants	higher dicots	Oleaceae	<i>Jasminum simplicifolium</i> subsp. <i>australiense</i>			C		1/1
plants	higher dicots	Oleaceae	<i>Notelaea microcarpa</i>			C		1
plants	higher dicots	Oleaceae	<i>Jasminum didymum</i> subsp. <i>lineare</i>			C		1
plants	higher dicots	Oxalidaceae	<i>Oxalis</i>			C		2/1
plants	higher dicots	Oxalidaceae	<i>Oxalis perennans</i>			C		1/1
plants	higher dicots	Pentapetaceae	<i>Melhania oblongifolia</i>			C		5/1
plants	higher dicots	Phyllanthaceae	<i>Phyllanthus maderaspatensis</i>			C		4/4
plants	higher dicots	Phyllanthaceae	<i>Bridelia leichhardtii</i>			C		1/1
plants	higher dicots	Phyllanthaceae	<i>Phyllanthus</i>			C		1
plants	higher dicots	Phyllanthaceae	<i>Flueggea leucopyrus</i>			C		1/1
plants	higher dicots	Phyllanthaceae	<i>Breynia oblongifolia</i>			C		1/1
plants	higher dicots	Phyllanthaceae	<i>Phyllanthus collinus</i>			C		1/1
plants	higher dicots	Phyllanthaceae	<i>Phyllanthus virgatus</i>			C		3/1
plants	higher dicots	Picrodendraceae	<i>Petalostigma pubescens</i>	quinine tree		C		8/1
plants	higher dicots	Pittosporaceae	<i>Bursaria incana</i>			C		5/1
plants	higher dicots	Pittosporaceae	<i>Pittosporum spinescens</i>			C		2
plants	higher dicots	Pittosporaceae	<i>Pittosporum angustifolium</i>			C		1
plants	higher dicots	Polygonaceae	<i>Persicaria orientalis</i>	princes feathers		C		1/1
plants	higher dicots	Polygonaceae	<i>Persicaria attenuata</i>			C		2/2
plants	higher dicots	Polygonaceae	<i>Persicaria lapathifolia</i>	pale knotweed		C		2/2
plants	higher dicots	Portulacaceae	<i>Portulaca oleracea</i>	pigweed	Y			3
plants	higher dicots	Portulacaceae	<i>Portulaca bicolor</i>			C		1
plants	higher dicots	Proteaceae	<i>Grevillea striata</i>	beefwood		C		1
plants	higher dicots	Proteaceae	<i>Hakea lorea</i> subsp. <i>lorea</i>			C		1
plants	higher dicots	Rhamnaceae	<i>Cryptandra speciosa</i> subsp. <i>strigosa</i>			C		2/2
plants	higher dicots	Rhamnaceae	<i>Ventilago viminalis</i>	supplejack		C		3
plants	higher dicots	Rhamnaceae	<i>Alphitonia excelsa</i>	soap tree		C		12/2
plants	higher dicots	Rubiaceae	<i>Psychotria daphnoides</i>			C		2/2
plants	higher dicots	Rubiaceae	<i>Triflorensia ixoroides</i>			C		1

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plants	higher dicots	Rubiaceae	<i>Everistia vacciniifolia</i>			C		3
plants	higher dicots	Rubiaceae	<i>Psydrax oleifolia</i>			C		4
plants	higher dicots	Rubiaceae	<i>Psydrax johnsonii</i>			C		7/1
plants	higher dicots	Rubiaceae	<i>Psydrax forsteri</i>			C		3/2
plants	higher dicots	Rubiaceae	<i>Pogonolobus reticulatus</i>			C		1/1
plants	higher dicots	Rubiaceae	<i>Spermacoce sp. (Dislyn A.R.Bean 14098)</i>			C		1/1
plants	higher dicots	Rubiaceae	<i>Oldenlandia coerulescens</i>			C		1/1
plants	higher dicots	Rutaceae	<i>Citrus glauca</i>			C		12/10
plants	higher dicots	Rutaceae	<i>Boronia bipinnata</i>	rock boronia		C		1
plants	higher dicots	Rutaceae	<i>Geijera parviflora</i>	wilga		C		12/2
plants	higher dicots	Rutaceae	<i>Geijera salicifolia</i>	brush wilga		C		1/1
plants	higher dicots	Rutaceae	<i>Flindersia dissosperma</i>			C		5/4
plants	higher dicots	Rutaceae	<i>Boronia occidentalis</i>			C		1/1
plants	higher dicots	Rutaceae	<i>Philotheca difformis subsp. difformis</i>			C		1/1
plants	higher dicots	Santalaceae	<i>Santalum lanceolatum</i>			C		3/1
plants	higher dicots	Sapindaceae	<i>Alectryon diversifolius</i>	scrub boonaree		C		1
plants	higher dicots	Sapindaceae	<i>Dodonaea stenophylla</i>			C		1
plants	higher dicots	Sapindaceae	<i>Alectryon oleifolius</i>			C		2
plants	higher dicots	Sapindaceae	<i>Atalaya hemiglauca</i>			C		7
plants	higher dicots	Sapindaceae	<i>Dodonaea filifolia</i>			C		1
plants	higher dicots	Sapindaceae	<i>Dodonaea viscosa subsp. spatulata</i>			C		3/1
plants	higher dicots	Sapindaceae	<i>Dodonaea tenuifolia</i>			C		1/1
plants	higher dicots	Sapindaceae	<i>Dodonaea viscosa</i>			C		1
plants	higher dicots	Sapindaceae	<i>Alectryon connatus</i>	grey birds-eye		C		4/3
plants	higher dicots	Sapotaceae	<i>Planchonella pubescens</i>			C		1/1
plants	higher dicots	Solanaceae	<i>Solanum mitchellianum</i>			C		1/1
plants	higher dicots	Solanaceae	<i>Solanum seaforthianum</i>	Brazilian nightshade	Y			1
plants	higher dicots	Solanaceae	<i>Physalis lanceifolia</i>		Y			1/1
plants	higher dicots	Solanaceae	<i>Solanum parvifolium</i>			C		2
plants	higher dicots	Solanaceae	<i>Datura leichhardtii</i>	native thornapple	Y			1/1
plants	higher dicots	Solanaceae	<i>Solanum nodiflorum</i>		Y			1/1
plants	higher dicots	Solanaceae	<i>Solanum ellipticum</i>	potato bush		C		7
plants	higher dicots	Solanaceae	<i>Physalis ixocarpa</i>	annual ground cherry	Y			1/1
plants	higher dicots	Sparrmanniaceae	<i>Grewia latifolia</i>	dysentery plant		C		8/3
plants	higher dicots	Sparrmanniaceae	<i>Grewia retusifolia</i>			C		1
plants	higher dicots	Sparrmanniaceae	<i>Corchorus tomentellus</i>			C		1
plants	higher dicots	Sparrmanniaceae	<i>Corchorus trilocularis</i>			C		1/1
plants	higher dicots	Sterculiaceae	<i>Brachychiton australis</i>	broad-leaved bottle tree		C		2/1
plants	higher dicots	Sterculiaceae	<i>Brachychiton bidwillii</i>	little kurrajong		C		1/1
plants	higher dicots	Sterculiaceae	<i>Brachychiton rupestris</i>			C		3/1
plants	higher dicots	Stylidiaceae	<i>Stylidium eglandulosum</i>			C		1
plants	higher dicots	Thymelaeaceae	<i>Pimelea haematostachya</i>			C		1
plants	higher dicots	Ulmaceae	<i>Trema tomentosa</i>			C		1/1
plants	higher dicots	Urticaceae	<i>Dendrocnide photinophylla</i>	shiny-leaved stinging tree		C		1/1
plants	higher dicots	Verbenaceae	<i>Verbena africana</i>			C		1/1
plants	higher dicots	Verbenaceae	<i>Verbena macrostachya</i>			C		1/1

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plants	higher dicots	Verbenaceae	<i>Lantana montevidensis</i>	creeping lantana	Y			1/1
plants	higher dicots	Vitaceae	<i>Cissus oblonga</i>			C		1/1
plants	higher dicots	Vitaceae	<i>Clematicissus opaca</i>			C		2/1
plants	higher dicots	Zygophyllaceae	<i>Tribulus micrococcus</i>	yellow vine		C		2/2
plants	higher dicots	Zygophyllaceae	<i>Tribulus terrestris</i>	caltrop		C		2/1
plants	lower dicots	Menispermaceae	<i>Tinospora smilacina</i>	snakevine		C		1
plants	lower dicots	Menispermaceae	<i>Stephania japonica</i>			C		1
plants	monocots	Amaryllidaceae	<i>Crinum flaccidum</i>	Murray lily		C		1
plants	monocots	Commelinaceae	<i>Commelina diffusa</i>	wandering jew		C		1
plants	monocots	Commelinaceae	<i>Commelina ensifolia</i>	scurvy grass		C		1/1
plants	monocots	Cyperaceae	<i>Cyperus fulvus</i>			C		2/2
plants	monocots	Cyperaceae	<i>Cyperus gunnii</i>			C		1
plants	monocots	Cyperaceae	<i>Cyperus gilesii</i>			C		3/3
plants	monocots	Cyperaceae	<i>Cyperus gracilis</i>			C		8/1
plants	monocots	Cyperaceae	<i>Cyperus pygmaeus</i>	dwarf sedge		C		1/1
plants	monocots	Cyperaceae	<i>Cyperus rotundus</i>	nutgrass	Y			1/1
plants	monocots	Cyperaceae	<i>Cyperus bowmannii</i>			C		2/1
plants	monocots	Cyperaceae	<i>Cyperus concinnus</i>			C		1/1
plants	monocots	Cyperaceae	<i>Cyperus difformis</i>	rice sedge		C		1/1
plants	monocots	Cyperaceae	<i>Cyperus javanicus</i>			C		1/1
plants	monocots	Cyperaceae	<i>Cyperus tuberosus</i>		Y			1
plants	monocots	Cyperaceae	<i>Cyperus leiocaulon</i>			C		1/1
plants	monocots	Cyperaceae	<i>Scleria sphacelata</i>			C		2/1
plants	monocots	Cyperaceae	<i>Scleria mackaviensis</i>			C		2/2
plants	monocots	Cyperaceae	<i>Bulbostylis turbinata</i>			C		1/1
plants	monocots	Cyperaceae	<i>Fimbristylis aestivalis</i>			C		1/1
plants	monocots	Cyperaceae	<i>Fimbristylis sieberiana</i>			C		1/1
plants	monocots	Cyperaceae	<i>Cyperus nutans</i> var. <i>eleusinoides</i>	flatsedge		C		1/1
plants	monocots	Cyperaceae	<i>Cyperus dietrichiae</i> var. <i>brevibracteatus</i>			C		2
plants	monocots	Cyperaceae	<i>Cyperus bifax</i>	western nutgrass		C		1
plants	monocots	Cyperaceae	<i>Fimbristylis</i>			C		1
plants	monocots	Cyperaceae	<i>Cyperus</i>			C		1
plants	monocots	Cyperaceae	<i>Cyperus iria</i>			C		1/1
plants	monocots	Hemerocallidaceae	<i>Dianella caerulea</i>			C		1
plants	monocots	Hemerocallidaceae	<i>Dianella caerulea</i> var. <i>vannata</i>			C		1/1
plants	monocots	Hemerocallidaceae	<i>Dianella longifolia</i>			C		1
plants	monocots	Hypoxidaceae	<i>Hypoxis arillacea</i>			C		1/1
plants	monocots	Hypoxidaceae	<i>Hypoxis pratensis</i>			C		1/1
plants	monocots	Laxmanniaceae	<i>Lomandra longifolia</i>			C		5
plants	monocots	Laxmanniaceae	<i>Lomandra</i>			C		1
plants	monocots	Laxmanniaceae	<i>Eustrephus latifolius</i>	wombat berry		C		2
plants	monocots	Orchidaceae	<i>Cymbidium canaliculatum</i>			C		2
plants	monocots	Poaceae	<i>Aristida queenslandica</i> var. <i>dissimilis</i>			C		10
plants	monocots	Poaceae	<i>Aristida jerichoensis</i> var. <i>subspinulifera</i>			C		4/1
plants	monocots	Poaceae	<i>Tragus australianus</i>	small burr grass		C		3
plants	monocots	Poaceae	<i>Aristida longicollis</i>			C		1

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plants	monocots	Poaceae	<i>Bothriochloa bladhii</i>			C		4
plants	monocots	Poaceae	<i>Cymbopogon refractus</i>	barbed-wire grass		C		3
plants	monocots	Poaceae	<i>Dichanthium fecundum</i>	curly bluegrass		C		1/1
plants	monocots	Poaceae	<i>Dichanthium sericeum</i>			C		6
plants	monocots	Poaceae	<i>Digitaria parviflora</i>			C		7
plants	monocots	Poaceae	<i>Eragrostis kennedyae</i>	small-flowered lovegrass		C		1/1
plants	monocots	Poaceae	<i>Eragrostis lacunaria</i>	purple lovegrass		C		10/1
plants	monocots	Poaceae	<i>Eragrostis tenellula</i>	delicate lovegrass		C		1
plants	monocots	Poaceae	<i>Leptochloa decipiens</i>			C		5
plants	monocots	Poaceae	<i>Panicum decompositum</i>			C		6
plants	monocots	Poaceae	<i>Setaria verticillata</i>	whorled pigeon grass	Y			1
plants	monocots	Poaceae	<i>Sporobolus contiguus</i>			C		1
plants	monocots	Poaceae	<i>Sporobolus scabridus</i>			C		2/1
plants	monocots	Poaceae	<i>Aristida jerichoensis</i>			C		1
plants	monocots	Poaceae	<i>Cymbopogon bombycinus</i>	silky oilgrass		C		3/2
plants	monocots	Poaceae	<i>Digitaria breviglumis</i>			C		2
plants	monocots	Poaceae	<i>Eragrostis parviflora</i>	weeping lovegrass		C		2/1
plants	monocots	Poaceae	<i>Heteropogon contortus</i>	black speargrass		C		9/1
plants	monocots	Poaceae	<i>Iseilema vaginiflorum</i>	red flinders grass		C		1
plants	monocots	Poaceae	<i>Setaria oplismenoides</i>			C		1/1
plants	monocots	Poaceae	<i>Alloteropsis semialata</i>	cockatoo grass		C		1
plants	monocots	Poaceae	<i>Aristida caput-medusae</i>			C		10
plants	monocots	Poaceae	<i>Bothriochloa ewartiana</i>	desert bluegrass		C		2
plants	monocots	Poaceae	<i>Cleistochloa subjuncea</i>			C		1/1
plants	monocots	Poaceae	<i>Enneapogon intermedius</i>			C		1/1
plants	monocots	Poaceae	<i>Enneapogon lindleyanus</i>			C		10
plants	monocots	Poaceae	<i>Enneapogon polyphyllus</i>	leafy nineawn		C		1
plants	monocots	Poaceae	<i>Enteropogon acicularis</i>	curly windmill grass		C		3
plants	monocots	Poaceae	<i>Enteropogon unispiceus</i>			C		4
plants	monocots	Poaceae	<i>Eragrostis cilianensis</i>		Y			1
plants	monocots	Poaceae	<i>Moorochloa eruciformis</i>		Y			2/2
plants	monocots	Poaceae	<i>Panicum queenslandicum</i>			C		1
plants	monocots	Poaceae	<i>Paspalidium criniforme</i>			C		1
plants	monocots	Poaceae	<i>Paspalidium globoideum</i>	sago grass		C		2/1
plants	monocots	Poaceae	<i>Paspalidium jubiflorum</i>	warrego grass		C		1
plants	monocots	Poaceae	<i>Setaria paspalidioides</i>			C		2/1
plants	monocots	Poaceae	<i>Thyridolepis xerophila</i>			C		6/1
plants	monocots	Poaceae	<i>Urochloa mosambicensis</i>	sabi grass	Y			3/2
plants	monocots	Poaceae	<i>Ancistrachne uncinulata</i>	hooky grass		C		3/2
plants	monocots	Poaceae	<i>Calypochloa gracillima</i>			C		3
plants	monocots	Poaceae	<i>Dactyloctenium radulans</i>	button grass		C		2/1
plants	monocots	Poaceae	<i>Enneapogon purpurascens</i>			C		3/1
plants	monocots	Poaceae	<i>Eragrostis megalosperma</i>			C		2/1
plants	monocots	Poaceae	<i>Paspalidium caespitosum</i>	brigalow grass		C		3/1
plants	monocots	Poaceae	<i>Paspalidium constrictum</i>			C		5/5
plants	monocots	Poaceae	<i>Pseudoraphis spinescens</i>	spiny mudgrass		C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	monocots	Poaceae	<i>Sporobolus actinocladius</i>	katoora grass		C		3/1
plants	monocots	Poaceae	<i>Enteropogon paucispiceus</i>			C		1
plants	monocots	Poaceae	<i>Paspalidium albobillosum</i>			C		2/2
plants	monocots	Poaceae	<i>Sporobolus australasicus</i>			C		1
plants	monocots	Poaceae	<i>Bothriochloa erianthoides</i>	satintop grass		C		1/1
plants	monocots	Poaceae	<i>Cymbopogon queenslandicus</i>			C		1
plants	monocots	Poaceae	<i>Digitaria divaricatissima</i>	spreading umbrella grass		C		1/1
plants	monocots	Poaceae	<i>Thyridolepis mitchelliana</i>	mulga mitchell grass		C		1/1
plants	monocots	Poaceae	<i>Dichanthium queenslandicum</i>			V	V	4/4
plants	monocots	Poaceae	<i>Eriochloa pseudoacrotricha</i>			C		1/1
plants	monocots	Poaceae	<i>Leptochloa fusca subsp. fusca</i>			C		1/1
plants	monocots	Poaceae	<i>Cynodon dactylon var. dactylon</i>		Y			1/1
plants	monocots	Poaceae	<i>Chloris divaricata var. divaricata</i>	slender chloris		C		3/1
plants	monocots	Poaceae	<i>Bothriochloa bladhii subsp. bladhii</i>			C		1
plants	monocots	Poaceae	<i>Dichanthium sericeum subsp. sericeum</i>			C		2/2
plants	monocots	Poaceae	<i>Leptochloa decipiens subsp. decipiens</i>			C		1/1
plants	monocots	Poaceae	<i>Panicum</i>			C		3
plants	monocots	Poaceae	<i>Aristida</i>			C		4
plants	monocots	Poaceae	<i>Digitaria</i>			C		1
plants	monocots	Poaceae	<i>Enneapogon</i>			C		3/1
plants	monocots	Poaceae	<i>Eragrostis</i>			C		3
plants	monocots	Poaceae	<i>Echinochloa</i>			C		1
plants	monocots	Poaceae	<i>Paspalidium</i>			C		3
plants	monocots	Poaceae	<i>Perotis rara</i>	comet grass		C		2/1
plants	monocots	Poaceae	<i>Melinis repens</i>	red natal grass	Y			11
plants	monocots	Poaceae	<i>Panicum buncei</i>			C		1/1
plants	monocots	Poaceae	<i>Aristida ramosa</i>	purple wiregrass		C		3/1
plants	monocots	Poaceae	<i>Chloris virgata</i>	feathertop rhodes grass	Y			1
plants	monocots	Poaceae	<i>Panicum effusum</i>			C		3
plants	monocots	Poaceae	<i>Setaria dielsii</i>			C		5
plants	monocots	Poaceae	<i>Setaria surgens</i>			C		4/1
plants	monocots	Poaceae	<i>Sorghum bicolor</i>	forage sorghum	Y			1/1
plants	monocots	Poaceae	<i>Aristida lignosa</i>			C		3
plants	monocots	Poaceae	<i>Digitaria orbata</i>			C		1/1
plants	monocots	Poaceae	<i>Eriochloa crebra</i>	spring grass		C		3/2
plants	monocots	Poaceae	<i>Hyparrhenia rufa</i>		Y			1/1
plants	monocots	Poaceae	<i>Leptochloa fusca</i>	brown beetle grass		C		1
plants	monocots	Poaceae	<i>Themeda triandra</i>	kangaroo grass		C		4
plants	monocots	Poaceae	<i>Urochloa foliosa</i>			C		4
plants	monocots	Poaceae	<i>Aristida calycina</i>			C		1
plants	monocots	Poaceae	<i>Aristida contorta</i>	bunched kerosene grass		C		1
plants	monocots	Poaceae	<i>Astrebla lappacea</i>	curly mitchell grass		C		1
plants	monocots	Poaceae	<i>Avena ludoviciana</i>		Y			1/1
plants	monocots	Poaceae	<i>Digitaria brownii</i>			C		4/4
plants	monocots	Poaceae	<i>Entolasia stricta</i>	wiry panic		C		3
plants	monocots	Poaceae	<i>Eriochloa procera</i>	slender cupgrass		C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	monocots	Poaceae	<i>Leptochloa neesii</i>			C		1
plants	monocots	Poaceae	<i>Sporobolus caroli</i>	fairy grass		C		4
plants	monocots	Poaceae	<i>Urochloa piligera</i>			C		1/1
plants	monocots	Poaceae	<i>Aristida benthamii</i>			C		1
plants	monocots	Poaceae	<i>Aristida holathera</i>			C		3
plants	monocots	Poaceae	<i>Aristida latifolia</i>	feathertop wiregrass		C		7/2
plants	monocots	Poaceae	<i>Aristida lazaridis</i>			C		1/1
plants	monocots	Poaceae	<i>Aristida leptopoda</i>	white speargrass		C		4/2
plants	monocots	Poaceae	<i>Aristida personata</i>			C		3
plants	monocots	Poaceae	<i>Astrebla squarrosa</i>	bull mitchell grass		C		2
plants	monocots	Poaceae	<i>Chloris ventricosa</i>	tall chloris		C		1
plants	monocots	Poaceae	<i>Chrysopogon fallax</i>			C		1
plants	monocots	Poaceae	<i>Digitaria bicornis</i>			C		1/1
plants	monocots	Poaceae	<i>Digitaria porrecta</i>				NT E	1/1
plants	monocots	Poaceae	<i>Echinochloa colona</i>	awnless barnyard grass	Y			1
plants	monocots	Poaceae	<i>Eragrostis sororia</i>			C		5
plants	monocots	Poaceae	<i>Eriachne mucronata</i>			C		1
plants	monocots	Poaceae	<i>Oplismenus aemulus</i>	creeping shade grass		C		1/1
plants	monocots	Poaceae	<i>Pennisetum ciliare</i>			C		11
plants	monocots	Poaceae	<i>Triodia mitchellii</i>	buck spinifex		C		1
plants	monocots	Poaceae	<i>Urochloa decumbens</i>		Y			1/1
plants	monocots	Poaceae	<i>Aristida gracilipes</i>			C		1
plants	monocots	Poaceae	<i>Cymbopogon obtectus</i>			C		1/1
plants	monocots	Poaceae	<i>Digitaria ramularis</i>			C		3
plants	monocots	Poaceae	<i>Enneapogon gracilis</i>	slender nineawn		C		3/1
plants	monocots	Poaceae	<i>Enteropogon ramosus</i>			C		1
plants	monocots	Poaceae	<i>Eragrostis elongata</i>			C		1
plants	monocots	Poaceae	<i>Eragrostis speciosa</i>			C		2
plants	monocots	Poaceae	<i>Eriochloa fatmensis</i>			C		1
plants	monocots	Poaceae	<i>Leptochloa ligulata</i>			C		1/1
plants	monocots	Poaceae	<i>Megathyrsus maximus</i>		Y			2
plants	monocots	Poaceae	<i>Panicum larcomianum</i>			C		2/1
plants	monocots	Poaceae	<i>Paspalidium distans</i>	shotgrass		C		4
plants	monocots	Poaceae	<i>Paspalidium gracile</i>	slender panic		C		10/2
plants	monocots	Potamogetonaceae	<i>Potamogeton crispus</i>	curly pondweed		C		1/1
plants	monocots	Typhaceae	<i>Typha orientalis</i>	broad-leaved cumbungi		C		1
plants	whisk ferns	Psilotaceae	<i>Psilotum nudum</i>	skeleton fork fern		C		1/1

CODES

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

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

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

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

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

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



Wildlife Online Extract

Search Criteria: Species List for a Defined Area
Species: All
Type: All
Status: All
Records: All
Date: All
Latitude: 23.0953 to 23.5353
Longitude: 147.4747 to 147.9356
Email: hdick@aacrc.net.au
Date submitted: Monday 28 May 2012 16:06:07
Date extracted: Monday 28 May 2012 16:10:04

The number of records retrieved = 458

Disclaimer

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

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Bufonidae	<i>Rhinella marina</i>	cane toad	Y			4
animals	amphibians	Hylidae	<i>Litoria inermis</i>	bumpy rocketfrog		C		3/1
animals	amphibians	Hylidae	<i>Litoria peronii</i>	emerald spotted treefrog		C		2
animals	amphibians	Hylidae	<i>Litoria rubella</i>	ruddy treefrog		C		4
animals	amphibians	Hylidae	<i>Litoria caerulea</i>	common green treefrog		C		2
animals	amphibians	Hylidae	<i>Cyclorana brevipes</i>	superb collared frog		C		2/1
animals	amphibians	Hylidae	<i>Cyclorana alboguttata</i>	greenstripe frog		C		16/1
animals	amphibians	Hylidae	<i>Cyclorana novaehollandiae</i>	eastern snapping frog		C		4/1
animals	amphibians	Hylidae	<i>Litoria fallax</i>	eastern sedgefrog		C		1
animals	amphibians	Hylidae	<i>Litoria latopalmata</i>	broad palmed rocketfrog		C		6
animals	amphibians	Limnodynastidae	<i>Platyplectrum ornatum</i>	ornate burrowing frog		C		4
animals	amphibians	Myobatrachidae	<i>Uperoleia rugosa</i>	chubby gungan		C		1
animals	amphibians	Myobatrachidae	<i>Crinia deserticola</i>	chirping froglet		C		1
animals	birds	Acanthizidae	<i>Smicrornis brevirostris</i>	weebill		C		7
animals	birds	Acanthizidae	<i>Acanthiza nana</i>	yellow thornbill		C		4
animals	birds	Acanthizidae	<i>Acanthiza apicalis</i>	inland thornbill		C		6
animals	birds	Acanthizidae	<i>Acanthiza reguloides</i>	buff-rumped thornbill		C		5
animals	birds	Acanthizidae	<i>Gerygone albogularis</i>	white-throated gerygone		C		4
animals	birds	Acanthizidae	<i>Acanthiza chrysorrhoa</i>	yellow-rumped thornbill		C		2
animals	birds	Acanthizidae	<i>Chthonicola sagittata</i>	speckled warbler		C		5
animals	birds	Accipitridae	<i>Hieraaetus morphnoides</i>	little eagle		C		2
animals	birds	Accipitridae	<i>Accipiter cirrocephalus</i>	collared sparrowhawk		C		1
animals	birds	Accipitridae	<i>Haliastur sphenurus</i>	whistling kite		C		1
animals	birds	Accipitridae	<i>Aviceda subcristata</i>	Pacific baza		C		1
animals	birds	Accipitridae	<i>Accipiter fasciatus</i>	brown goshawk		C		4
animals	birds	Accipitridae	<i>Elanus axillaris</i>	black-shouldered kite		C		3
animals	birds	Accipitridae	<i>Aquila audax</i>	wedge-tailed eagle		C		7
animals	birds	Aegothelidae	<i>Aegotheles cristatus</i>	Australian owl-nightjar		C		1
animals	birds	Anatidae	<i>Dendrocygna arcuata</i>	wandering whistling-duck		C		1
animals	birds	Anatidae	<i>Nettapus coromandelianus</i>	cotton pygmy-goose		NT		1
animals	birds	Anatidae	<i>Cygnus atratus</i>	black swan		C		1
animals	birds	Anatidae	<i>Anas gracilis</i>	grey teal		C		1
animals	birds	Anatidae	<i>Anas superciliosa</i>	Pacific black duck		C		6
animals	birds	Anatidae	<i>Chenonetta jubata</i>	Australian wood duck		C		7
animals	birds	Anatidae	<i>Aythya australis</i>	hardhead		C		7
animals	birds	Anhingidae	<i>Anhinga novaehollandiae</i>	Australasian darter		C		2
animals	birds	Ardeidae	<i>Ardea pacifica</i>	white-necked heron		C		1
animals	birds	Ardeidae	<i>Egretta garzetta</i>	little egret		C		1
animals	birds	Ardeidae	<i>Nycticorax caledonicus</i>	Nankeen night-heron		C		1
animals	birds	Ardeidae	<i>Egretta novaehollandiae</i>	white-faced heron		C		2
animals	birds	Artamidae	<i>Artamus superciliosus</i>	white-browed woodswallow		C		1
animals	birds	Artamidae	<i>Cracticus nigrogularis</i>	pied butcherbird		C		7
animals	birds	Artamidae	<i>Artamus minor</i>	little woodswallow		C		2
animals	birds	Artamidae	<i>Artamus cinereus</i>	black-faced woodswallow		C		1
animals	birds	Artamidae	<i>Cracticus tibicen</i>	Australian magpie		C		9
animals	birds	Artamidae	<i>Artamus personatus</i>	masked woodswallow		C		3

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Artamidae	<i>Strepera graculina</i>	pied currawong		C		8
animals	birds	Artamidae	<i>Cracticus torquatus</i>	grey butcherbird		C		6
animals	birds	Artamidae	<i>Artamus leucorhynchus</i>	white-breasted woodswallow		C		1
animals	birds	Burhinidae	<i>Burhinus grallarius</i>	bush stone-curlew		C		3
animals	birds	Cacatuidae	<i>Calyptorhynchus funereus</i>	yellow-tailed black-cockatoo		C		1
animals	birds	Cacatuidae	<i>Cacatua galerita</i>	sulphur-crested cockatoo		C		9
animals	birds	Cacatuidae	<i>Eolophus roseicapillus</i>	galah		C		10
animals	birds	Cacatuidae	<i>Nymphicus hollandicus</i>	cockatiel		C		7
animals	birds	Campephagidae	<i>Coracina papuensis</i>	white-bellied cuckoo-shrike		C		3
animals	birds	Campephagidae	<i>Coracina maxima</i>	ground cuckoo-shrike		C		1
animals	birds	Campephagidae	<i>Coracina novaehollandiae</i>	black-faced cuckoo-shrike		C		6
animals	birds	Casuariidae	<i>Dromaius novaehollandiae</i>	emu		C		2
animals	birds	Charadriidae	<i>Vanellus miles novaehollandiae</i>	masked lapwing (southern subspecies)		C		4
animals	birds	Charadriidae	<i>Vanellus miles miles</i>	masked lapwing (northern subspecies)		C		3
animals	birds	Charadriidae	<i>Vanellus tricolor</i>	banded lapwing		C		2
animals	birds	Charadriidae	<i>Elseya melanops</i>	black-fronted dotterel		C		3
animals	birds	Cisticolidae	<i>Cisticola exilis</i>	golden-headed cisticola		C		2
animals	birds	Climacteridae	<i>Climacteris picumnus</i>	brown treecreeper		C		1
animals	birds	Columbidae	<i>Geopelia cuneata</i>	diamond dove		C		2
animals	birds	Columbidae	<i>Geopelia striata</i>	peaceful dove		C		5
animals	birds	Columbidae	<i>Ocyphaps lophotes</i>	crested pigeon		C		12
animals	birds	Columbidae	<i>Phaps chalcoptera</i>	common bronzewing		C		2
animals	birds	Coraciidae	<i>Eurystomus orientalis</i>	dollarbird		C		4
animals	birds	Corcoracidae	<i>Corcorax melanorhamphos</i>	white-winged chough		C		2
animals	birds	Corcoracidae	<i>Struthidea cinerea</i>	apostlebird		C		10
animals	birds	Corvidae	<i>Corvus orru</i>	Torresian crow		C		13
animals	birds	Corvidae	<i>Corvus coronoides</i>	Australian raven		C		3
animals	birds	Cuculidae	<i>Scythrops novaehollandiae</i>	channel-billed cuckoo		C		2
animals	birds	Cuculidae	<i>Centropus phasianinus</i>	pheasant coucal		C		4
animals	birds	Cuculidae	<i>Eudynamys orientalis</i>	eastern koel		C		3
animals	birds	Cuculidae	<i>Chalcites basalus</i>	Horsfield's bronze-cuckoo		C		3
animals	birds	Cuculidae	<i>Chalcites osculans</i>	black-eared cuckoo		C		1
animals	birds	Estrildidae	<i>Lonchura castaneothorax</i>	chestnut-breasted mannikin		C		1
animals	birds	Estrildidae	<i>Neochmia modesta</i>	plum-headed finch		C		2
animals	birds	Estrildidae	<i>Taeniopygia guttata</i>	zebra finch		C		2
animals	birds	Estrildidae	<i>Taeniopygia bichenovii</i>	double-barred finch		C		8
animals	birds	Eurostopodidae	<i>Eurostopodus argus</i>	spotted nightjar		C		1
animals	birds	Falconidae	<i>Falco cenchroides</i>	nankeen kestrel		C		7
animals	birds	Falconidae	<i>Falco berigora</i>	brown falcon		C		5
animals	birds	Gruidae	<i>Grus rubicunda</i>	brilga		C		6
animals	birds	Halcyonidae	<i>Todiramphus sanctus</i>	sacred kingfisher		C		3
animals	birds	Halcyonidae	<i>Todiramphus pyrrhopygius</i>	red-backed kingfisher		C		1
animals	birds	Halcyonidae	<i>Dacelo leachii</i>	blue-winged kookaburra		C		2
animals	birds	Halcyonidae	<i>Dacelo novaeguineae</i>	laughing kookaburra		C		10
animals	birds	Halcyonidae	<i>Todiramphus macleayi</i>	forest kingfisher		C		1
animals	birds	Hirundinidae	<i>Petrochelidon nigricans</i>	tree martin		C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Maluridae	<i>Malurus cyaneus</i>	superb fairy-wren		C		4
animals	birds	Maluridae	<i>Malurus lamberti</i>	variegated fairy-wren		C		6
animals	birds	Maluridae	<i>Malurus melanocephalus</i>	red-backed fairy-wren		C		9
animals	birds	Megaluridae	<i>Cincloramphus mathewsi</i>	rufous songlark		C		2
animals	birds	Megaluridae	<i>Megalurus timoriensis</i>	tawny grassbird		C		3
animals	birds	Meliphagidae	<i>Melithreptus lunatus</i>	white-naped honeyeater		C		1
animals	birds	Meliphagidae	<i>Philemon corniculatus</i>	noisy friarbird		C		9
animals	birds	Meliphagidae	<i>Manorina melanocephala</i>	noisy miner		C		6
animals	birds	Meliphagidae	<i>Philemon citreogularis</i>	little friarbird		C		8
animals	birds	Meliphagidae	<i>Ptilotula penicillatus</i>	white-plumed honeyeater		C		7
animals	birds	Meliphagidae	<i>Acanthagenys rufogularis</i>	spiny-cheeked honeyeater		C		9
animals	birds	Meliphagidae	<i>Melithreptus albogularis</i>	white-throated honeyeater		C		5
animals	birds	Meliphagidae	<i>Plectorhyncha lanceolata</i>	striped honeyeater		C		8
animals	birds	Meliphagidae	<i>Caligavis chrysops</i>	yellow-faced honeyeater		C		2
animals	birds	Meliphagidae	<i>Entomyzon cyanotis</i>	blue-faced honeyeater		C		11
animals	birds	Meliphagidae	<i>Gavicalis virescens</i>	singing honeyeater		C		6
animals	birds	Meliphagidae	<i>Lichmera indistincta</i>	brown honeyeater		C		7
animals	birds	Meliphagidae	<i>Ptilotula fuscus</i>	fuscous honeyeater		C		1/1
animals	birds	Meliphagidae	<i>Ptilotula plumulus</i>	grey-fronted honeyeater		C		2
animals	birds	Meliphagidae	<i>Manorina flavigula</i>	yellow-throated miner		C		4
animals	birds	Meropidae	<i>Merops ornatus</i>	rainbow bee-eater		C		6
animals	birds	Monarchidae	<i>Myiagra rubecula</i>	leaden flycatcher		C		5
animals	birds	Monarchidae	<i>Grallina cyanoleuca</i>	magpie-lark		C		12
animals	birds	Monarchidae	<i>Myiagra inquieta</i>	restless flycatcher		C		2
animals	birds	Motacillidae	<i>Anthus novaeseelandiae</i>	Australasian pipit		C		3
animals	birds	Nectariniidae	<i>Dicaeum hirundinaceum</i>	mistletoebird		C		6
animals	birds	Oriolidae	<i>Sphecotheres vieilloti</i>	Australasian figbird		C		1
animals	birds	Oriolidae	<i>Oriolus sagittatus</i>	olive-backed oriole		C		4
animals	birds	Otididae	<i>Ardeotis australis</i>	Australian bustard		C		4
animals	birds	Pachycephalidae	<i>Colluricincla harmonica</i>	grey shrike-thrush		C		7
animals	birds	Pachycephalidae	<i>Pachycephala rufiventris</i>	rufous whistler		C		13
animals	birds	Pardalotidae	<i>Pardalotus striatus</i>	striated pardalote		C		12
animals	birds	Pardalotidae	<i>Pardalotus punctatus</i>	spotted pardalote		C		1
animals	birds	Pelecanidae	<i>Pelecanus conspicillatus</i>	Australian pelican		C		1
animals	birds	Petroicidae	<i>Petroica goodenovii</i>	red-capped robin		C		2
animals	birds	Petroicidae	<i>Eopsaltria australis</i>	eastern yellow robin		C		1
animals	birds	Petroicidae	<i>Melanodryas cucullata</i>	hooded robin		C		2
animals	birds	Petroicidae	<i>Microeca fascinans</i>	jacky winter		C		8
animals	birds	Phaethontidae	<i>Phaethon rubricauda</i>	red-tailed tropicbird		V		1
animals	birds	Phalacrocoracidae	<i>Phalacrocorax sulcirostris</i>	little black cormorant		C		1
animals	birds	Phalacrocoracidae	<i>Microcarbo melanoleucos</i>	little pied cormorant		C		1
animals	birds	Podargidae	<i>Podargus strigoides</i>	tawny frogmouth		C		1
animals	birds	Podicipedidae	<i>Tachybaptus novaehollandiae</i>	Australasian grebe		C		1
animals	birds	Pomatostomidae	<i>Pomatostomus temporalis</i>	grey-crowned babbler		C		7
animals	birds	Psittacidae	<i>Aprosmictus erythropterus</i>	red-winged parrot		C		10
animals	birds	Psittacidae	<i>Melopsittacus undulatus</i>	budgerigar		C		4

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Psittacidae	<i>Trichoglossus haematodus moluccanus</i>	rainbow lorikeet		C		10
animals	birds	Psittacidae	<i>Trichoglossus chlorolepidotus</i>	scaly-breasted lorikeet		C		1
animals	birds	Psittacidae	<i>Platycercus adscitus palliceps</i>	pale-headed rosella (southern form)		C		2
animals	birds	Psittacidae	<i>Platycercus adscitus</i>	pale-headed rosella		C		8
animals	birds	Ptilonorhynchidae	<i>Ptilonorhynchus maculatus</i>	spotted bowerbird		C		8
animals	birds	Rhipiduridae	<i>Rhipidura albiscapa</i>	grey fantail		C		8
animals	birds	Rhipiduridae	<i>Rhipidura leucophrys</i>	willie wagtail		C		12
animals	birds	Strigidae	<i>Ninox boobook</i>	southern boobook		C		7
animals	birds	Threskiornithidae	<i>Threskiornis spinicollis</i>	straw-necked ibis		C		2
animals	birds	Timaliidae	<i>Zosterops lateralis</i>	silveryeye		C		1
animals	mammals	Bovidae	<i>Bos taurus</i>	European cattle	Y			1
animals	mammals	Dasyuridae	<i>Sminthopsis macroura</i>	stripe-faced dunnart		C		1
animals	mammals	Dasyuridae	<i>Dasyurus hallucatus</i>	northern quoll		C	E	1
animals	mammals	Emballonuridae	<i>Saccolaimus flaviventris</i>	yellow-bellied sheath-tail bat		C		2
animals	mammals	Felidae	<i>Felis catus</i>	cat	Y			2
animals	mammals	Macropodidae	<i>Macropus giganteus</i>	eastern grey kangaroo		C		5
animals	mammals	Macropodidae	<i>Macropus robustus</i>	common wallaroo		C		2
animals	mammals	Macropodidae	<i>Wallabia bicolor</i>	swamp wallaby		C		6
animals	mammals	Macropodidae	<i>Petrogale herberti</i>	Herbert's rock-wallaby		C		12/9
animals	mammals	Macropodidae	<i>Lagorchestes conspicillatus</i>	spectacled hare-wallaby		C		28/2
animals	mammals	Muridae	<i>Pseudomys patrius</i>	eastern pebble-mound mouse		C		2
animals	mammals	Muridae	<i>Mus musculus</i>	house mouse	Y			3
animals	mammals	Muridae	<i>Rattus tunneyi</i>	pale field-rat		C		1/1
animals	mammals	Muridae	<i>Pseudomys delicatulus</i>	delicate mouse		C		1
animals	mammals	Muridae	<i>Hydromys chrysogaster</i>	water rat		C		1
animals	mammals	Peramelidae	<i>Isoodon macrourus</i>	northern brown bandicoot		C		1
animals	mammals	Petauridae	<i>Petaurus breviceps</i>	sugar glider		C		1
animals	mammals	Phalangeridae	<i>Trichosurus vulpecula</i>	common brushtail possum		C		1
animals	mammals	Phascolarctidae	<i>Phascolarctos cinereus</i>	koala		C	V	5
animals	mammals	Potoroidae	<i>Aepyprymnus rufescens</i>	rufous bettong		C		4
animals	mammals	Pteropodidae	<i>Pteropus scapulatus</i>	little red flying-fox		C		2
animals	mammals	Tachyglossidae	<i>Tachyglossus aculeatus</i>	short-beaked echidna		C		1
animals	mammals	Vespertilionidae	<i>Vespadelus pumilus</i>	eastern forest bat		C		1
animals	mammals	Vespertilionidae	<i>Chalinolobus gouldii</i>	Gould's wattled bat		C		1/1
animals	reptiles	Agamidae	<i>Amphibolurus nobbi</i>			C		1/1
animals	reptiles	Agamidae	<i>Pogona barbata</i>	bearded dragon		C		2
animals	reptiles	Agamidae	<i>Diporiphora australis</i>			C		1/1
animals	reptiles	Agamidae	<i>Chlamydosaurus kingii</i>	frilled lizard		C		1
animals	reptiles	Boidae	<i>Aspidites melanocephalus</i>	black-headed python		C		1
animals	reptiles	Boidae	<i>Antaresia maculosa</i>	spotted python		C		1
animals	reptiles	Carphodactylidae	<i>Nephrurus asper</i>	spiny knob-tailed gecko		C		1
animals	reptiles	Chelidae	<i>Chelodina longicollis</i>	eastern snake-necked turtle		C		1
animals	reptiles	Colubridae	<i>Dendrelaphis punctulata</i>	common tree snake		C		1
animals	reptiles	Colubridae	<i>Tropidonophis mairii</i>	freshwater snake		C		2
animals	reptiles	Colubridae	<i>Boiga irregularis</i>	brown tree snake		C		1
animals	reptiles	Diplodactylidae	<i>Oedura monilis</i>			C		2/1

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animals	reptiles	Diplodactylidae	<i>Amolosia rhombifer</i>	zig-zag gecko		C		1
animals	reptiles	Elapidae	<i>Hoplocephalus bitorquatus</i>	pale-headed snake		C		1
animals	reptiles	Elapidae	<i>Pseudonaja textilis</i>	eastern brown snake		C		2
animals	reptiles	Elapidae	<i>Demansia psammophis</i>	yellow-faced whip snake		C		1
animals	reptiles	Elapidae	<i>Furina diadema</i>	red-naped snake		C		1
animals	reptiles	Elapidae	<i>Cryptophis boschmai</i>	Carpentaria whip snake		C		1
animals	reptiles	Gekkonidae	<i>Heteronotia binoei</i>	Bynoe's gecko		C		5
animals	reptiles	Gekkonidae	<i>Gehyra dubia</i>			C		1/1
animals	reptiles	Gekkonidae	<i>Gehyra catenata</i>			C		2/2
animals	reptiles	Pygopodidae	<i>Delma tincta</i>			C		1/1
animals	reptiles	Pygopodidae	<i>Pygopus lepidopodus</i>	common scaly-foot		C		1
animals	reptiles	Scincidae	<i>Cryptoblepharus pannosus</i>	ragged snake-eyed skink		C		1/1
animals	reptiles	Scincidae	<i>Lerista punctatovittata</i>			C		1
animals	reptiles	Scincidae	<i>Tiliqua scincoides</i>	eastern blue-tongued lizard		C		1
animals	reptiles	Scincidae	<i>Egernia striolata</i>	tree skink		C		2
animals	reptiles	Scincidae	<i>Ctenotus robustus</i>			C		1
animals	reptiles	Scincidae	<i>Carlia pectoralis</i>			C		3
animals	reptiles	Scincidae	<i>Egernia rugosa</i>	yakka skink		V	V	1
animals	reptiles	Scincidae	<i>Menetia sp.</i>					1
animals	reptiles	Scincidae	<i>Lerista fragilis</i>			C		2
animals	reptiles	Typhlopidae	<i>Ramphotyphlops proximus</i>			C		1
animals	reptiles	Typhlopidae	<i>Ramphotyphlops ligatus</i>			C		1/1
animals	reptiles	Varanidae	<i>Varanus gouldii</i>	sand monitor		C		2
animals	reptiles	Varanidae	<i>Varanus tristis</i>	black-tailed monitor		C		2
plants	conifers	Cupressaceae	<i>Callitris glaucophylla</i>	white cypress pine		C		2
plants	ferns	Adiantaceae	<i>Cheilanthes brownii</i>			C		1
plants	ferns	Adiantaceae	<i>Cheilanthes sieberi</i>			C		1
plants	ferns	Adiantaceae	<i>Cheilanthes</i>			C		2
plants	higher dicots	Acanthaceae	<i>Brunoniella australis</i>	blue trumpet		C		1
plants	higher dicots	Acanthaceae	<i>Rostellularia adscendens</i>			C		1
plants	higher dicots	Amaranthaceae	<i>Gomphrena celosioides</i>	gomphrena weed	Y			1
plants	higher dicots	Amaranthaceae	<i>Amaranthus interruptus</i>			C		1/1
plants	higher dicots	Amaranthaceae	<i>Alternanthera</i>			C		1
plants	higher dicots	Amaranthaceae	<i>Achyranthes aspera</i>			C		3
plants	higher dicots	Amaranthaceae	<i>Nyssanthus diffusa</i>	barbed-wire weed		C		2
plants	higher dicots	Amaranthaceae	<i>Gomphrena</i>			C		1
plants	higher dicots	Apocynaceae	<i>Marsdenia viridiflora</i>			C		2
plants	higher dicots	Apocynaceae	<i>Parsonsia straminea</i>	monkey rope		C		1
plants	higher dicots	Apocynaceae	<i>Alstonia constricta</i>	bitterbark		C		1
plants	higher dicots	Apocynaceae	<i>Carissa ovata</i>	currantbush		C		15
plants	higher dicots	Apocynaceae	<i>Parsonsia</i>			C		2
plants	higher dicots	Asclepiadaceae	<i>Sarcostemma</i>			C		1
plants	higher dicots	Asteraceae	<i>Cyanthillium cinereum</i>			C		2
plants	higher dicots	Asteraceae	<i>Vittadinia tenuissima</i>	western New Holland daisy		C		1
plants	higher dicots	Asteraceae	<i>Wedelia spilanthoides</i>			C		2/1
plants	higher dicots	Asteraceae	<i>Ozothamnus cassinioides</i>			C		1/1

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plants	higher dicots	Asteraceae	<i>Gnaphalium diamantinense</i>			C		1/1
plants	higher dicots	Asteraceae	<i>Parthenium hysterophorus</i>	parthenium weed	Y			1
plants	higher dicots	Asteraceae	<i>Pterocaulon serrulatum</i> var. <i>serrulatum</i>			C		1/1
plants	higher dicots	Asteraceae	<i>Euchiton</i> sp. (Hughenden C.E.Hubbard+ 7639)			C		1/1
plants	higher dicots	Asteraceae	<i>Bidens pilosa</i>		Y			1
plants	higher dicots	Asteraceae	<i>Calotis lappulacea</i>	yellow burr daisy		C		1/1
plants	higher dicots	Asteraceae	<i>Vittadinia pustulata</i>			C		1/1
plants	higher dicots	Asteraceae	<i>Rhodanthe polyphylla</i>			C		1/1
plants	higher dicots	Asteraceae	<i>Pterocaulon redolens</i>			C		1
plants	higher dicots	Asteraceae	<i>Peripleura hispidula</i>			C		2
plants	higher dicots	Asteraceae	<i>Cassinia laevis</i>			C		1/1
plants	higher dicots	Asteraceae	<i>Calotis squamigera</i>			C		1/1
plants	higher dicots	Asteraceae	<i>Minuria integerrima</i>	smooth minuria		C		1/1
plants	higher dicots	Boraginaceae	<i>Heliotropium amplexicaule</i>	blue heliotrope	Y			1/1
plants	higher dicots	Boraginaceae	<i>Heliotropium cunninghamii</i>			C		1/1
plants	higher dicots	Brassicaceae	<i>Cardamine</i>			C		1/1
plants	higher dicots	Cactaceae	<i>Opuntia</i>		Y			1
plants	higher dicots	Caesalpiniaceae	<i>Lysiphyllum carronii</i>	ebony tree		C		1
plants	higher dicots	Caesalpiniaceae	<i>Lysiphyllum hookeri</i>	Queensland ebony		C		1
plants	higher dicots	Caesalpiniaceae	<i>Cassia brewsteri</i>			C		2
plants	higher dicots	Campanulaceae	<i>Wahlenbergia</i>			C		1
plants	higher dicots	Capparaceae	<i>Capparis lasiantha</i>	nipan		C		5
plants	higher dicots	Capparaceae	<i>Capparis canescens</i>			C		1
plants	higher dicots	Casuarinaceae	<i>Casuarina cunninghamiana</i>			C		1
plants	higher dicots	Chenopodiaceae	<i>Sclerolaena ramulosa</i>			C		1
plants	higher dicots	Chenopodiaceae	<i>Maireana microphylla</i>			C		1/1
plants	higher dicots	Chenopodiaceae	<i>Enchylaena tomentosa</i>			C		2
plants	higher dicots	Chenopodiaceae	<i>Maireana</i>			C		3
plants	higher dicots	Chenopodiaceae	<i>Chenopodium carinatum</i>	green crumbweed		C		1/1
plants	higher dicots	Convolvulaceae	<i>Evolvulus alsinoides</i>			C		2
plants	higher dicots	Convolvulaceae	<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>			C		1
plants	higher dicots	Cucurbitaceae	<i>Cucurbita</i>			C		1
plants	higher dicots	Ebenaceae	<i>Diospyros humilis</i>	small-leaved ebony		C		2
plants	higher dicots	Ericaceae	<i>Melichrus</i>			C		1
plants	higher dicots	Erythroxylaceae	<i>Erythroxylum australe</i>	cocaine tree		C		9
plants	higher dicots	Erythroxylaceae	<i>Erythroxylum</i> sp. (Splityard Creek L.Pedley 5360)			C		1
plants	higher dicots	Euphorbiaceae	<i>Euphorbia</i>			C		2
plants	higher dicots	Euphorbiaceae	<i>Chamaesyce drummondii</i>	caustic-weed		C		1
plants	higher dicots	Euphorbiaceae	<i>Ricinocarpos ledifolius</i>	scrub wedding bush		C		1/1
plants	higher dicots	Fabaceae	<i>Glycine</i>			C		4
plants	higher dicots	Fabaceae	<i>Indigofera</i>			C		4
plants	higher dicots	Fabaceae	<i>Glycine tabacina</i>	glycine pea		C		2
plants	higher dicots	Fabaceae	<i>Rhynchosia minima</i>			C		2
plants	higher dicots	Fabaceae	<i>Indigofera helmsii</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Tephrosia filipes</i> subsp. <i>filipes</i>			C		2/1
plants	higher dicots	Fabaceae	<i>Cullen australasicum</i>			C		1/1

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plants	higher dicots	Fabaceae	<i>Indigofera pratensis</i>			C		2/2
plants	higher dicots	Fabaceae	<i>Desmodium brachypodum</i>	large ticktrefoil		C		1/1
plants	higher dicots	Fabaceae	<i>Rhynchosia minima</i> var. <i>minima</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Rhynchosia minima</i> var. <i>australis</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Indigofera linnaei</i>	Birdsville indigo		C		1
plants	higher dicots	Gentianaceae	<i>Centaurium erythraea</i>	common centaury	Y			1/1
plants	higher dicots	Goodeniaceae	<i>Goodenia rotundifolia</i>			C		2
plants	higher dicots	Goodeniaceae	<i>Brunonia australis</i>	blue pincushion		C		1
plants	higher dicots	Lamiaceae	<i>Basilicum polystachyon</i>			C		1/1
plants	higher dicots	Lamiaceae	<i>Spartothamnella juncea</i>	native broom		C		1/1
plants	higher dicots	Loranthaceae	<i>Amyema miquelii</i>			C		1/1
plants	higher dicots	Loranthaceae	<i>Lysiana subfalcata</i>			C		1/1
plants	higher dicots	Malvaceae	<i>Sida</i>			C		4
plants	higher dicots	Malvaceae	<i>Abutilon</i>			C		2
plants	higher dicots	Malvaceae	<i>Hibiscus</i>			C		3
plants	higher dicots	Malvaceae	<i>Malvastrum</i>			C		1
plants	higher dicots	Malvaceae	<i>Sida fibulifera</i>			C		1
plants	higher dicots	Malvaceae	<i>Sida filiformis</i>			C		2
plants	higher dicots	Malvaceae	<i>Sida atherophora</i>			C		1
plants	higher dicots	Malvaceae	<i>Sida hackettiana</i>			C		1
plants	higher dicots	Malvaceae	<i>Gossypium australe</i>			C		1/1
plants	higher dicots	Malvaceae	<i>Hibiscus krichauffianus</i>			C		2
plants	higher dicots	Malvaceae	<i>Malvastrum americanum</i> var. <i>americanum</i>		Y			3
plants	higher dicots	Malvaceae	<i>Malvastrum coromandelianum</i> subsp. <i>coromandelianum</i>		Y			1/1
plants	higher dicots	Mimosaceae	<i>Acacia fodinalis</i>			C		2
plants	higher dicots	Mimosaceae	<i>Acacia harpophylla</i>	brigalow		C		3
plants	higher dicots	Mimosaceae	<i>Acacia salicina</i>	doolan		C		1
plants	higher dicots	Mimosaceae	<i>Acacia excelsa</i>			C		1
plants	higher dicots	Mimosaceae	<i>Acacia</i>			C		5
plants	higher dicots	Mimosaceae	<i>Acacia shirleyi</i>	lancewood		C		3
plants	higher dicots	Mimosaceae	<i>Acacia leptostachya</i>	Townsville wattle		C		1/1
plants	higher dicots	Mimosaceae	<i>Archidendropsis basaltica</i>	red lancewood		C		4
plants	higher dicots	Mimosaceae	<i>Archidendropsis thozetiana</i>			C		3/2
plants	higher dicots	Mimosaceae	<i>Acacia excelsa</i> subsp. <i>excelsa</i>			C		1/1
plants	higher dicots	Mimosaceae	<i>Acacia julifera</i> subsp. <i>curvinervia</i>			C		1/1
plants	higher dicots	Moraceae	<i>Ficus</i>			C		1
plants	higher dicots	Moraceae	<i>Ficus rubiginosa</i> forma <i>rubiginosa</i>			C		1/1
plants	higher dicots	Myoporaceae	<i>Myoporum</i>			C		5
plants	higher dicots	Myoporaceae	<i>Eremophila deserti</i>			C		2/1
plants	higher dicots	Myoporaceae	<i>Myoporum acuminatum</i>	coastal boobialla		C		1/1
plants	higher dicots	Myoporaceae	<i>Eremophila mitchellii</i>			C		8
plants	higher dicots	Myrtaceae	<i>Melaleuca linariifolia</i>	snow-in summer		C		1
plants	higher dicots	Myrtaceae	<i>Eucalyptus melanophloia</i>			C		14
plants	higher dicots	Myrtaceae	<i>Eucalyptus tereticornis</i>			C		1
plants	higher dicots	Myrtaceae	<i>Leptospermum lamellatum</i>			C		1
plants	higher dicots	Myrtaceae	<i>Eucalyptus camaldulensis</i> subsp. <i>acuta</i>			C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	higher dicots	Myrtaceae	<i>Eucalyptus orgadophila</i>	mountain coolibah		C		2
plants	higher dicots	Myrtaceae	<i>Corymbia erythrophloia</i>	variable-barked bloodwood		C		8
plants	higher dicots	Myrtaceae	<i>Eucalyptus thozetiana</i>			C		2
plants	higher dicots	Myrtaceae	<i>Eucalyptus cambageana</i>	Dawson gum		C		5
plants	higher dicots	Myrtaceae	<i>Corymbia trachyphloia</i>			C		1
plants	higher dicots	Myrtaceae	<i>Corymbia clarksoniana</i>			C		1
plants	higher dicots	Myrtaceae	<i>Corymbia tessellaris</i>	Moreton Bay ash		C		2
plants	higher dicots	Myrtaceae	<i>Corymbia dallachiana</i>			C		10/2
plants	higher dicots	Myrtaceae	<i>Melaleuca viminalis</i>			C		1
plants	higher dicots	Myrtaceae	<i>Melaleuca bracteata</i>			C		1
plants	higher dicots	Myrtaceae	<i>Eucalyptus populnea</i>	poplar box		C		5
plants	higher dicots	Myrtaceae	<i>Corymbia intermedia</i>	pink bloodwood		C		1
plants	higher dicots	Myrtaceae	<i>Corymbia citriodora</i>	spotted gum		C		2
plants	higher dicots	Myrtaceae	<i>Angophora leiocarpa</i>	rusty gum		C		1
plants	higher dicots	Myrtaceae	<i>Corymbia trachyphloia</i> subsp. <i>trachyphloia</i>			C		1
plants	higher dicots	Myrtaceae	<i>Asteromyrtus</i>			C		1
plants	higher dicots	Myrtaceae	<i>Corymbia</i>			C		2
plants	higher dicots	Myrtaceae	<i>Eucalyptus crebra</i>	narrow-leaved red ironbark		C		6
plants	higher dicots	Nyctaginaceae	<i>Boerhavia burbridgeana</i>			C		1
plants	higher dicots	Nyctaginaceae	<i>Boerhavia pubescens</i>			C		1/1
plants	higher dicots	Oleaceae	<i>Notelaea microcarpa</i>			C		1
plants	higher dicots	Pentapetaceae	<i>Melhania oblongifolia</i>			C		1
plants	higher dicots	Phyllanthaceae	<i>Phyllanthus fuernrohrii</i>			C		2/1
plants	higher dicots	Phyllanthaceae	<i>Phyllanthus virgatus</i>			C		2
plants	higher dicots	Phyllanthaceae	<i>Breynia oblongifolia</i>			C		2
plants	higher dicots	Phyllanthaceae	<i>Breynia</i>			C		2
plants	higher dicots	Picrodendraceae	<i>Petalostigma pubescens</i>	quinine tree		C		2
plants	higher dicots	Pittosporaceae	<i>Bursaria incana</i>			C		3/1
plants	higher dicots	Pittosporaceae	<i>Pittosporum spinescens</i>			C		1
plants	higher dicots	Polygalaceae	<i>Polygala linariifolia</i>			C		1/1
plants	higher dicots	Portulacaceae	<i>Portulaca oleracea</i>	pigweed	Y			2
plants	higher dicots	Proteaceae	<i>Grevillea striata</i>	beefwood		C		2
plants	higher dicots	Rhamnaceae	<i>Alphitonia excelsa</i>	soap tree		C		6
plants	higher dicots	Rubiaceae	<i>Psydrax</i>			C		1/1
plants	higher dicots	Rubiaceae	<i>Pogonolobus reticulatus</i>			C		1
plants	higher dicots	Rubiaceae	<i>Psydrax odorata</i> subsp. <i>australiana</i>			C		1/1
plants	higher dicots	Rubiaceae	<i>Psydrax johnsonii</i>			C		1
plants	higher dicots	Rubiaceae	<i>Psydrax oleifolia</i>			C		1
plants	higher dicots	Rutaceae	<i>Flindersia dissosperma</i>			C		1
plants	higher dicots	Rutaceae	<i>Geijera parviflora</i>	wilga		C		7
plants	higher dicots	Santalaceae	<i>Santalum lanceolatum</i>			C		1
plants	higher dicots	Sapindaceae	<i>Dodonaea viscosa</i>			C		3
plants	higher dicots	Sapindaceae	<i>Atalaya hemiglauca</i>			C		5
plants	higher dicots	Sapindaceae	<i>Alectryon diversifolius</i>	scrub boonaree		C		2
plants	higher dicots	Sapindaceae	<i>Dodonaea viscosa</i> subsp. <i>spatulata</i>			C		1/1
plants	higher dicots	Sapotaceae	<i>Planchonella cotinifolia</i>			C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	higher dicots	Solanaceae	<i>Solanum</i>			C		1
plants	higher dicots	Solanaceae	<i>Solanum seaforthianum</i>	Brazilian nightshade	Y			1/1
plants	higher dicots	Sparrmanniaceae	<i>Grewia latifolia</i>	dysentery plant		C		5
plants	higher dicots	Sterculiaceae	<i>Brachychiton rupestris</i>			C		1
plants	higher dicots	Verbenaceae	<i>Lantana camara</i>		Y			1/1
plants	higher dicots	Violaceae	<i>Hybanthus monopetalus</i>			C		1
plants	higher dicots	Violaceae	<i>Hybanthus enneaspermus</i>			C		1/1
plants	higher dicots	Vitaceae	<i>Cissus hypoglauca</i>			C		1
plants	monocots	Cyperaceae	<i>Cyperus</i>			C		6
plants	monocots	Cyperaceae	<i>Cyperus iria</i>			C		1/1
plants	monocots	Cyperaceae	<i>Scleria mackaviensis</i>			C		1
plants	monocots	Cyperaceae	<i>Schoenus subaphyllus</i>			C		1/1
plants	monocots	Cyperaceae	<i>Scleria sphacelata</i>			C		1
plants	monocots	Cyperaceae	<i>Abildgaardia ovata</i>			C		2/1
plants	monocots	Cyperaceae	<i>Cyperus pygmaeus</i>	dwarf sedge		C		1/1
plants	monocots	Cyperaceae	<i>Fimbristylis</i>			C		1
plants	monocots	Cyperaceae	<i>Cyperus fulvus</i>			C		2/1
plants	monocots	Cyperaceae	<i>Cyperus gracilis</i>			C		4
plants	monocots	Hemerocallidaceae	<i>Dianella revoluta</i>			C		1
plants	monocots	Laxmanniaceae	<i>Lomandra filiformis</i>			C		1
plants	monocots	Laxmanniaceae	<i>Lomandra</i>			C		3
plants	monocots	Laxmanniaceae	<i>Lomandra multiflora subsp. multiflora</i>			C		1/1
plants	monocots	Laxmanniaceae	<i>Lomandra confertifolia</i>			C		1
plants	monocots	Laxmanniaceae	<i>Lomandra longifolia</i>			C		1
plants	monocots	Poaceae	<i>Panicum decompositum var. decompositum</i>			C		1/1
plants	monocots	Poaceae	<i>Bothriochloa decipiens var. cloncurrrensensis</i>			C		1/1
plants	monocots	Poaceae	<i>Chloris</i>			C		6
plants	monocots	Poaceae	<i>Aristida</i>			C		18
plants	monocots	Poaceae	<i>Entolasia</i>			C		2
plants	monocots	Poaceae	<i>Enneapogon</i>			C		6
plants	monocots	Poaceae	<i>Eragrostis</i>			C		4
plants	monocots	Poaceae	<i>Dichanthium</i>			C		2
plants	monocots	Poaceae	<i>Paspalidium</i>			C		2
plants	monocots	Poaceae	<i>Perotis rara</i>	comet grass		C		1/1
plants	monocots	Poaceae	<i>Melinis repens</i>	red natal grass	Y			3
plants	monocots	Poaceae	<i>Aristida ramosa</i>	purple wiregrass		C		1
plants	monocots	Poaceae	<i>Chloris virgata</i>	feathertop rhodes grass	Y			1
plants	monocots	Poaceae	<i>Panicum effusum</i>			C		4
plants	monocots	Poaceae	<i>Themeda triandra</i>	kangaroo grass		C		10
plants	monocots	Poaceae	<i>Triraphis mollis</i>	purple plumegrass		C		1/1
plants	monocots	Poaceae	<i>Urochloa gilesii</i>			C		1
plants	monocots	Poaceae	<i>Urochloa reptans</i>			C		1/1
plants	monocots	Poaceae	<i>Entolasia stricta</i>	wiry panic		C		1
plants	monocots	Poaceae	<i>Sporobolus caroli</i>	fairy grass		C		1
plants	monocots	Poaceae	<i>Aristida latifolia</i>	feathertop wiregrass		C		1
plants	monocots	Poaceae	<i>Aristida lazaridis</i>			C		3/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	monocots	Poaceae	<i>Aristida personata</i>			C		1/1
plants	monocots	Poaceae	<i>Chrysopogon fallax</i>			C		4
plants	monocots	Poaceae	<i>Eragrostis brownii</i>	Brown's lovegrass		C		2
plants	monocots	Poaceae	<i>Pennisetum ciliare</i>			C		6
plants	monocots	Poaceae	<i>Aristida gracilipes</i>			C		1/1
plants	monocots	Poaceae	<i>Enneapogon gracilis</i>	slender nineawn		C		4/4
plants	monocots	Poaceae	<i>Paspalidium distans</i>	shotgrass		C		1
plants	monocots	Poaceae	<i>Paspalidium gracile</i>	slender panic		C		3
plants	monocots	Poaceae	<i>Tragus australianus</i>	small burr grass		C		4
plants	monocots	Poaceae	<i>Bothriochloa bladhii</i>			C		1/1
plants	monocots	Poaceae	<i>Bothriochloa pertusa</i>		Y			1
plants	monocots	Poaceae	<i>Cymbopogon refractus</i>	barbed-wire grass		C		1
plants	monocots	Poaceae	<i>Dichanthium fecundum</i>	curly bluegrass		C		1/1
plants	monocots	Poaceae	<i>Dichanthium sericeum</i>			C		1
plants	monocots	Poaceae	<i>Digitaria parviflora</i>			C		1
plants	monocots	Poaceae	<i>Enneapogon nigricans</i>	niggerheads		C		1
plants	monocots	Poaceae	<i>Eragrostis lacunaria</i>	purple lovegrass		C		2
plants	monocots	Poaceae	<i>Panicum decompositum</i>			C		2
plants	monocots	Poaceae	<i>Sporobolus contiguus</i>			C		1
plants	monocots	Poaceae	<i>Alloteropsis cimicina</i>			C		1/1
plants	monocots	Poaceae	<i>Cymbopogon bombycinus</i>	silky oilgrass		C		2/1
plants	monocots	Poaceae	<i>Eragrostis leptocarpa</i>	drooping lovegrass		C		2
plants	monocots	Poaceae	<i>Heteropogon contortus</i>	black speargrass		C		8
plants	monocots	Poaceae	<i>Sporobolus mitchellii</i>	rat's tail couch		C		2
plants	monocots	Poaceae	<i>Aristida caput-medusae</i>			C		3
plants	monocots	Poaceae	<i>Bothriochloa ewartiana</i>	desert bluegrass		C		3
plants	monocots	Poaceae	<i>Enneapogon lindleyanus</i>			C		7/1
plants	monocots	Poaceae	<i>Enneapogon polyphyllus</i>	leafy nineawn		C		2
plants	monocots	Poaceae	<i>Enteropogon unispiceus</i>			C		1
plants	monocots	Poaceae	<i>Eragrostis cilianensis</i>		Y			1
plants	monocots	Poaceae	<i>Paspalidium criniforme</i>			C		2
plants	monocots	Poaceae	<i>Thyridolepis xerophila</i>			C		2/1
plants	monocots	Poaceae	<i>Dactyloctenium radulans</i>	button grass		C		1
plants	monocots	Poaceae	<i>Eragrostis megalosperma</i>			C		2/1
plants	monocots	Poaceae	<i>Paspalidium constrictum</i>			C		1
plants	monocots	Poaceae	<i>Enneapogon robustissimus</i>			C		1/1
plants	monocots	Poaceae	<i>Cymbopogon queenslandicus</i>			C		1
plants	monocots	Poaceae	<i>Eriochloa pseudoacrotricha</i>			C		1
plants	monocots	Poaceae	<i>Sporobolus coromandelianus</i>		Y			1/1
plants	monocots	Poaceae	<i>Eragrostis longipedicellata</i>			C		1
plants	monocots	Poaceae	<i>Aristida benthamii</i> var. <i>benthamii</i>			C		1
plants	monocots	Poaceae	<i>Panicum decompositum</i> var. <i>tenuius</i>			C		1
plants	monocots	Poaceae	<i>Bothriochloa bladhii</i> subsp. <i>bladhii</i>			C		1/1
plants	monocots	Poaceae	<i>Aristida queenslandica</i> var. <i>dissimilis</i>			C		2

CODES

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

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

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

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

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

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



Wildlife Online Extract

Search Criteria: Species List for a Defined Area
Species: All
Type: All
Status: All
Records: All
Date: All
Latitude: 23.9978 to 23.5353
Longitude: 147.4747 to 147.9356
Email: hdick@aacrc.net.au
Date submitted: Monday 28 May 2012 16:00:43
Date extracted: Monday 28 May 2012 16:10:12

The number of records retrieved = 554

Disclaimer

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Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Hylidae	<i>Litoria caerulea</i>	common green treefrog		C		2
animals	amphibians	Hylidae	<i>Cyclorana alboguttata</i>	greenstripe frog		C		1
animals	amphibians	Hylidae	<i>Litoria latopalmata</i>	broad palmed rocketfrog		C		3
animals	amphibians	Hylidae	<i>Litoria rubella</i>	ruddy treefrog		C		1
animals	amphibians	Hylidae	<i>Litoria inermis</i>	bumpy rocketfrog		C		3
animals	amphibians	Limnodynastidae	<i>Limnodynastes tasmaniensis</i>	spotted grassfrog		C		1
animals	amphibians	Limnodynastidae	<i>Limnodynastes salmini</i>	salmon striped frog		C		2
animals	amphibians	Myobatrachidae	<i>Uperoleia rugosa</i>	chubby gungan		C		4/4
animals	amphibians	Myobatrachidae	<i>Crinia deserticola</i>	chirping froglet		C		1/1
animals	birds	Acanthizidae	<i>Gerygone fusca</i>	western gerygone		C		2
animals	birds	Acanthizidae	<i>Acanthiza nana</i>	yellow thornbill		C		3
animals	birds	Acanthizidae	<i>Smicromis brevirostris</i>	weebill		C		4
animals	birds	Acanthizidae	<i>Chthonicola sagittata</i>	speckled warbler		C		9
animals	birds	Acanthizidae	<i>Acanthiza apicalis</i>	inland thornbill		C		5
animals	birds	Acanthizidae	<i>Sericornis frontalis</i>	white-browed scrubwren		C		1
animals	birds	Acanthizidae	<i>Gerygone albogularis</i>	white-throated gerygone		C		9
animals	birds	Acanthizidae	<i>Acanthiza reguloides</i>	buff-rumped thornbill		C		6
animals	birds	Acanthizidae	<i>Acanthiza chrysorrhoa</i>	yellow-rumped thornbill		C		8
animals	birds	Accipitridae	<i>Aviceda subcristata</i>	Pacific baza		C		1
animals	birds	Accipitridae	<i>Haliastur sphenurus</i>	whistling kite		C		26
animals	birds	Accipitridae	<i>Haliaeetus leucogaster</i>	white-bellied sea-eagle		C		4
animals	birds	Accipitridae	<i>Hieraaetus morphnoides</i>	little eagle		C		5
animals	birds	Accipitridae	<i>Accipiter fasciatus</i>	brown goshawk		C		4
animals	birds	Accipitridae	<i>Lophoictinia isura</i>	square-tailed kite		NT		1
animals	birds	Accipitridae	<i>Circus approximans</i>	swamp harrier		C		2
animals	birds	Accipitridae	<i>Elanus axillaris</i>	black-shouldered kite		C		25
animals	birds	Accipitridae	<i>Circus assimilis</i>	spotted harrier		C		1
animals	birds	Accipitridae	<i>Milvus migrans</i>	black kite		C		5
animals	birds	Accipitridae	<i>Aquila audax</i>	wedge-tailed eagle		C		24
animals	birds	Accipitridae	<i>Accipiter cirrocephalus</i>	collared sparrowhawk		C		3
animals	birds	Accipitridae	<i>Erythrotriorchis radiatus</i>	red goshawk		E	V	1
animals	birds	Accipitridae	<i>Accipiter novaehollandiae</i>	grey goshawk		NT		1
animals	birds	Aegothelidae	<i>Aegotheles cristatus</i>	Australian owl-nightjar		C		7
animals	birds	Alaudidae	<i>Mirafra javanica</i>	Horsfield's bushlark		C		12
animals	birds	Anatidae	<i>Anas gracilis</i>	grey teal		C		19
animals	birds	Anatidae	<i>Malacorhynchus membranaceus</i>	pink-eared duck		C		3
animals	birds	Anatidae	<i>Nettapus coromandelianus</i>	cotton pygmy-goose		NT		4
animals	birds	Anatidae	<i>Dendrocygna arcuata</i>	wandering whistling-duck		C		4
animals	birds	Anatidae	<i>Dendrocygna eytoni</i>	plumed whistling-duck		C		6
animals	birds	Anatidae	<i>Chenonetta jubata</i>	Australian wood duck		C		15
animals	birds	Anatidae	<i>Anas superciliosa</i>	Pacific black duck		C		16
animals	birds	Anatidae	<i>Oxyura australis</i>	blue-billed duck		C		2
animals	birds	Anatidae	<i>Biziura lobata</i>	musk duck		C		1
animals	birds	Anatidae	<i>Cygnus atratus</i>	black swan		C		10
animals	birds	Anatidae	<i>Aythya australis</i>	hardhead		C		10
animals	birds	Anhingidae	<i>Anhinga novaehollandiae</i>	Australasian darter		C		11

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Ardeidae	<i>Ardea intermedia</i>	intermediate egret		C		11
animals	birds	Ardeidae	<i>Ardea pacifica</i>	white-necked heron		C		10
animals	birds	Ardeidae	<i>Ardea modesta</i>	eastern great egret		C		5
animals	birds	Ardeidae	<i>Ardea ibis</i>	cattle egret		C		2
animals	birds	Ardeidae	<i>Egretta novaehollandiae</i>	white-faced heron		C		11
animals	birds	Ardeidae	<i>Nycticorax caledonicus</i>	Nankeen night-heron		C		4
animals	birds	Ardeidae	<i>Egretta garzetta</i>	little egret		C		6
animals	birds	Artamidae	<i>Cracticus torquatus</i>	grey butcherbird		C		24
animals	birds	Artamidae	<i>Artamus leucorhynchus</i>	white-breasted woodswallow		C		23
animals	birds	Artamidae	<i>Artamus superciliosus</i>	white-browed woodswallow		C		1
animals	birds	Artamidae	<i>Cracticus nigrogularis</i>	piebald butcherbird		C		36
animals	birds	Artamidae	<i>Artamus minor</i>	little woodswallow		C		1
animals	birds	Artamidae	<i>Artamus cinereus</i>	black-faced woodswallow		C		6
animals	birds	Artamidae	<i>Cracticus tibicen</i>	Australian magpie		C		52
animals	birds	Artamidae	<i>Strepera graculina</i>	piebald currawong		C		4
animals	birds	Burhinidae	<i>Burhinus grallarius</i>	bush stone-curlew		C		1
animals	birds	Cacatuidae	<i>Cacatua sanguinea</i>	little corella		C		1
animals	birds	Cacatuidae	<i>Cacatua galerita</i>	sulphur-crested cockatoo		C		34
animals	birds	Cacatuidae	<i>Eolophus roseicapillus</i>	galah		C		37
animals	birds	Cacatuidae	<i>Nymphicus hollandicus</i>	cockatiel		C		38
animals	birds	Cacatuidae	<i>Calyptorhynchus banksii</i>	red-tailed black-cockatoo		C		1
animals	birds	Campephagidae	<i>Coracina novaehollandiae</i>	black-faced cuckoo-shrike		C		21
animals	birds	Campephagidae	<i>Coracina papuensis</i>	white-bellied cuckoo-shrike		C		1
animals	birds	Campephagidae	<i>Coracina maxima</i>	ground cuckoo-shrike		C		6
animals	birds	Campephagidae	<i>Lalage sueurii</i>	white-winged triller		C		3
animals	birds	Casuariidae	<i>Dromaius novaehollandiae</i>	emu		C		9
animals	birds	Charadriidae	<i>Vanellus miles novaehollandiae</i>	masked lapwing (southern subspecies)		C		1
animals	birds	Charadriidae	<i>Elseya melanops</i>	black-fronted dotterel		C		5
animals	birds	Charadriidae	<i>Vanellus tricolor</i>	banded lapwing		C		1
animals	birds	Charadriidae	<i>Vanellus miles</i>	masked lapwing		C		6
animals	birds	Charadriidae	<i>Vanellus miles miles</i>	masked lapwing (northern subspecies)		C		8
animals	birds	Ciconiidae	<i>Ephippiorhynchus asiaticus</i>	black-necked stork		NT		4
animals	birds	Cisticolidae	<i>Cisticola exilis</i>	golden-headed cisticola		C		17
animals	birds	Climacteridae	<i>Climacteris picumnus</i>	brown treecreeper		C		4
animals	birds	Columbidae	<i>Geopelia striata</i>	peaceful dove		C		11
animals	birds	Columbidae	<i>Geopelia cuneata</i>	diamond dove		C		1
animals	birds	Columbidae	<i>Phaps chalcoptera</i>	common bronzewing		C		14
animals	birds	Columbidae	<i>Geopelia humeralis</i>	bar-shouldered dove		C		12
animals	birds	Columbidae	<i>Ocyphaps lophotes</i>	crested pigeon		C		44
animals	birds	Coraciidae	<i>Eurystomus orientalis</i>	dollarbird		C		6
animals	birds	Corcoracidae	<i>Struthidea cinerea</i>	apostlebird		C		38
animals	birds	Corcoracidae	<i>Corcorax melanorhamphos</i>	white-winged chough		C		4
animals	birds	Corvidae	<i>Corvus sp.</i>					4
animals	birds	Corvidae	<i>Corvus orru</i>	Torresian crow		C		31
animals	birds	Corvidae	<i>Corvus bennetti</i>	little crow		C		5
animals	birds	Corvidae	<i>Corvus coronoides</i>	Australian raven		C		4

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Cuculidae	<i>Chalcites basalis</i>	Horsfield's bronze-cuckoo		C		1
animals	birds	Cuculidae	<i>Chalcites lucidus</i>	shining bronze-cuckoo		C		1
animals	birds	Cuculidae	<i>Cacomantis pallidus</i>	pallid cuckoo		C		4
animals	birds	Cuculidae	<i>Eudynamys orientalis</i>	eastern koel		C		1
animals	birds	Cuculidae	<i>Centropus phasianinus</i>	pheasant coucal		C		21
animals	birds	Cuculidae	<i>Cacomantis flabelliformis</i>	fan-tailed cuckoo		C		1
animals	birds	Cuculidae	<i>Scythrops novaehollandiae</i>	channel-billed cuckoo		C		4
animals	birds	Dicruridae	<i>Dicrurus bracteatus</i>	spangled drongo		C		2
animals	birds	Estrildidae	<i>Taeniopygia bichenovii</i>	double-barred finch		C		23
animals	birds	Estrildidae	<i>Lonchura castaneothorax</i>	chestnut-breasted mannikin		C		2
animals	birds	Estrildidae	<i>Taeniopygia guttata</i>	zebra finch		C		8
animals	birds	Estrildidae	<i>Neochmia modesta</i>	plum-headed finch		C		3
animals	birds	Eurostopodidae	<i>Eurostopodus argus</i>	spotted nightjar		C		1
animals	birds	Falconidae	<i>Falco peregrinus</i>	peregrine falcon		C		4
animals	birds	Falconidae	<i>Falco cenchroides</i>	nankeen kestrel		C		39
animals	birds	Falconidae	<i>Falco subniger</i>	black falcon		C		12
animals	birds	Falconidae	<i>Falco berigora</i>	brown falcon		C		25
animals	birds	Gruidae	<i>Grus rubicunda</i>	brolga		C		16
animals	birds	Halcyonidae	<i>Dacelo leachii</i>	blue-winged kookaburra		C		4
animals	birds	Halcyonidae	<i>Dacelo novaeguineae</i>	laughing kookaburra		C		23
animals	birds	Halcyonidae	<i>Todiramphus sanctus</i>	sacred kingfisher		C		2
animals	birds	Halcyonidae	<i>Todiramphus macleayii</i>	forest kingfisher		C		2
animals	birds	Halcyonidae	<i>Todiramphus pyrrhopygius</i>	red-backed kingfisher		C		3
animals	birds	Hirundinidae	<i>Petrochelidon ariel</i>	fairy martin		C		7
animals	birds	Hirundinidae	<i>Hirundo neoxena</i>	welcome swallow		C		3
animals	birds	Hirundinidae	<i>Petrochelidon nigricans</i>	tree martin		C		20
animals	birds	Jacanidae	<i>Irediparra gallinacea</i>	comb-crested jacana		C		3
animals	birds	Laridae	<i>Hydroprogne caspia</i>	Caspian tern		C		4
animals	birds	Laridae	<i>Chroicocephalus novaehollandiae</i>	silver gull		C		4
animals	birds	Maluridae	<i>Malurus melanocephalus</i>	red-backed fairy-wren		C		42
animals	birds	Maluridae	<i>Malurus lamberti</i>	variegated fairy-wren		C		16
animals	birds	Maluridae	<i>Malurus cyaneus</i>	superb fairy-wren		C		17
animals	birds	Megaluridae	<i>Cincloramphus mathewsi</i>	rufous songlark		C		2
animals	birds	Megaluridae	<i>Cincloramphus cruralis</i>	brown songlark		C		7
animals	birds	Megaluridae	<i>Megalurus gramineus</i>	little grassbird		C		1
animals	birds	Megaluridae	<i>Megalurus timoriensis</i>	tawny grassbird		C		1
animals	birds	Megapodiidae	<i>Alectura lathami</i>	Australian brush-turkey		C		1
animals	birds	Meliphagidae	<i>Philemon corniculatus</i>	noisy friarbird		C		14
animals	birds	Meliphagidae	<i>Acanthagenys rufogularis</i>	spiny-cheeked honeyeater		C		16
animals	birds	Meliphagidae	<i>Plectorhyncha lanceolata</i>	striped honeyeater		C		16
animals	birds	Meliphagidae	<i>Melithreptus albogularis</i>	white-throated honeyeater		C		4
animals	birds	Meliphagidae	<i>Ptilotula penicillatus</i>	white-plumed honeyeater		C		5
animals	birds	Meliphagidae	<i>Philemon citreogularis</i>	little friarbird		C		14
animals	birds	Meliphagidae	<i>Manorina melanocephala</i>	noisy miner		C		20
animals	birds	Meliphagidae	<i>Sugomel niger</i>	black honeyeater		C		1
animals	birds	Meliphagidae	<i>Ptilotula fuscus</i>	fuscous honeyeater		C		1

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animals	birds	Meliphagidae	<i>Meliphaga lewinii</i>	Lewin's honeyeater		C		2
animals	birds	Meliphagidae	<i>Caligavis chrysops</i>	yellow-faced honeyeater		C		2
animals	birds	Meliphagidae	<i>Entomyzon cyanotis</i>	blue-faced honeyeater		C		39
animals	birds	Meliphagidae	<i>Manorina flavigula</i>	yellow-throated miner		C		44
animals	birds	Meliphagidae	<i>Ptilotula plumulus</i>	grey-fronted honeyeater		C		1
animals	birds	Meliphagidae	<i>Gavicalis virescens</i>	singing honeyeater		C		21
animals	birds	Meliphagidae	<i>Lichmera indistincta</i>	brown honeyeater		C		11
animals	birds	Meropidae	<i>Merops ornatus</i>	rainbow bee-eater		C		7
animals	birds	Monarchidae	<i>Myiagra inquieta</i>	restless flycatcher		C		2
animals	birds	Monarchidae	<i>Myiagra rubecula</i>	leaden flycatcher		C		2
animals	birds	Monarchidae	<i>Grallina cyanoleuca</i>	magpie-lark		C		49
animals	birds	Motacillidae	<i>Anthus novaeseelandiae</i>	Australasian pipit		C		17
animals	birds	Nectariniidae	<i>Dicaeum hirundinaceum</i>	mistletoebird		C		13
animals	birds	Neosittidae	<i>Daphoenositta chrysoptera</i>	varied sittella		C		1
animals	birds	Oriolidae	<i>Oriolus sagittatus</i>	olive-backed oriole		C		7
animals	birds	Otididae	<i>Ardeotis australis</i>	Australian bustard		C		24
animals	birds	Pachycephalidae	<i>Pachycephala rufiventris</i>	rufous whistler		C		20
animals	birds	Pachycephalidae	<i>Oreoica gutturalis</i>	crested bellbird		C		1
animals	birds	Pachycephalidae	<i>Colluricincla harmonica</i>	grey shrike-thrush		C		9
animals	birds	Pardalotidae	<i>Pardalotus striatus</i>	striated pardalote		C		15
animals	birds	Pardalotidae	<i>Pardalotus punctatus</i>	spotted pardalote		C		1
animals	birds	Passeridae	<i>Passer domesticus</i>	house sparrow	Y			1
animals	birds	Pelecanidae	<i>Pelecanus conspicillatus</i>	Australian pelican		C		7
animals	birds	Petroicidae	<i>Petroica rosea</i>	rose robin		C		1
animals	birds	Petroicidae	<i>Melanodryas cucullata</i>	hooded robin		C		1
animals	birds	Petroicidae	<i>Petroica goodenovii</i>	red-capped robin		C		4
animals	birds	Petroicidae	<i>Microeca fascinans</i>	jacky winter		C		7
animals	birds	Phalacrocoracidae	<i>Phalacrocorax sulcirostris</i>	little black cormorant		C		11
animals	birds	Phalacrocoracidae	<i>Microcarbo melanoleucos</i>	little pied cormorant		C		5
animals	birds	Phalacrocoracidae	<i>Phalacrocorax varius</i>	pied cormorant		C		7
animals	birds	Phalacrocoracidae	<i>Phalacrocorax carbo</i>	great cormorant		C		1
animals	birds	Phasianidae	<i>Coturnix ypsilophora</i>	brown quail		C		24
animals	birds	Phasianidae	<i>Coturnix pectoralis</i>	stubble quail		C		2
animals	birds	Podargidae	<i>Podargus strigoides</i>	tawny frogmouth		C		4
animals	birds	Podargidae	<i>Podargus ocellatus plumiferus</i>	plumed frogmouth		V		1
animals	birds	Podicipedidae	<i>Tachybaptus novaehollandiae</i>	Australasian grebe		C		9
animals	birds	Podicipedidae	<i>Podiceps cristatus</i>	great crested grebe		C		3
animals	birds	Pomatostomidae	<i>Pomatostomus temporalis</i>	grey-crowned babbler		C		20
animals	birds	Psittacidae	<i>Aprosmictus erythropterus</i>	red-winged parrot		C		28
animals	birds	Psittacidae	<i>Trichoglossus haematodus moluccanus</i>	rainbow lorikeet		C		33
animals	birds	Psittacidae	<i>Platycercus adscitus</i>	pale-headed rosella		C		33
animals	birds	Ptilonorhynchidae	<i>Ptilonorhynchus maculatus</i>	spotted bowerbird		C		21
animals	birds	Rallidae	<i>Porphyrio porphyrio</i>	purple swamphen		C		5
animals	birds	Rallidae	<i>Fulica atra</i>	Eurasian coot		C		8
animals	birds	Rallidae	<i>Gallinula tenebrosa</i>	dusky moorhen		C		4
animals	birds	Recurvirostridae	<i>Himantopus himantopus</i>	black-winged stilt		C		2

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animals	birds	Rhipiduridae	<i>Rhipidura leucophrys</i>	willie wagtail		C		46
animals	birds	Rhipiduridae	<i>Rhipidura albiscapa</i>	grey fantail		C		13
animals	birds	Scolopacidae	<i>Tringa nebularia</i>	common greenshank		C		2
animals	birds	Strigidae	<i>Ninox boobook</i>	southern boobook		C		6
animals	birds	Threskiornithidae	<i>Threskiornis molucca</i>	Australian white ibis		C		6
animals	birds	Threskiornithidae	<i>Platalea flavipes</i>	yellow-billed spoonbill		C		7
animals	birds	Threskiornithidae	<i>Platalea regia</i>	royal spoonbill		C		6
animals	birds	Threskiornithidae	<i>Plegadis falcinellus</i>	glossy ibis		C		2
animals	birds	Threskiornithidae	<i>Threskiornis spinicollis</i>	straw-necked ibis		C		9
animals	birds	Timaliidae	<i>Zosterops lateralis</i>	silveryeye		C		2
animals	birds	Turnicidae	<i>Turnix pyrrhothorax</i>	red-chested button-quail		C		2
animals	birds	Tytonidae	<i>Tyto javanica</i>	eastern barn owl		C		13
animals	bony fish	Clupeidae	<i>Nematalosa erebi</i>	bony bream				1
animals	bony fish	Eleotridae	<i>Hypseleotris compressa</i>	empire gudgeon				1
animals	bony fish	Melanotaeniidae	<i>Melanotaenia splendida splendida</i>	eastern rainbowfish				1
animals	bony fish	Percichthyidae	<i>Macquaria ambigua</i>	golden perch				1
animals	bony fish	Terapontidae	<i>Leiopotherapon unicolor</i>	spangled perch				1
animals	mammals	Canidae	<i>Canis lupus dingo</i>	dingo				1
animals	mammals	Dasyuridae	<i>Planigale tenuirostris</i>	narrow-nosed planigale		C		1
animals	mammals	Dasyuridae	<i>Sminthopsis macroura</i>	stripe-faced dunnart		C		2
animals	mammals	Emballonuridae	<i>Saccolaimus flaviventris</i>	yellow-bellied sheath-tail bat		C		2
animals	mammals	Felidae	<i>Felis catus</i>	cat	Y			4
animals	mammals	Leporidae	<i>Oryctolagus cuniculus</i>	rabbit	Y			3
animals	mammals	Macropodidae	<i>Macropus robustus</i>	common wallaroo		C		8
animals	mammals	Macropodidae	<i>Macropus giganteus</i>	eastern grey kangaroo		C		6
animals	mammals	Macropodidae	<i>Petrogale herberti</i>	Herbert's rock-wallaby		C		2
animals	mammals	Macropodidae	<i>Lagorchestes conspicillatus</i>	spectacled hare-wallaby		C		6
animals	mammals	Macropodidae	<i>Wallabia bicolor</i>	swamp wallaby		C		2
animals	mammals	Macropodidae	<i>Macropus dorsalis</i>	black-striped wallaby		C		3
animals	mammals	Muridae	<i>Rattus sp. cf. villosissimus/sordidus</i>			C		6
animals	mammals	Muridae	<i>Pseudomys gracilicaudatus</i>	eastern chestnut mouse		C		2
animals	mammals	Muridae	<i>Pseudomys delicatulus</i>	delicate mouse		C		1
animals	mammals	Muridae	<i>Rattus tunneyi</i>	pale field-rat		C		3/2
animals	mammals	Muridae	<i>Leggadina forresti</i>	Forrest's mouse		C		2
animals	mammals	Muridae	<i>Hydromys chrysogaster</i>	water rat		C		1
animals	mammals	Muridae	<i>Mus musculus</i>	house mouse	Y			8
animals	mammals	Petauridae	<i>Petaurus breviceps</i>	sugar glider		C		2
animals	mammals	Phalangeridae	<i>Trichosurus vulpecula</i>	common brushtail possum		C		3
animals	mammals	Phascolarctidae	<i>Phascolarctos cinereus</i>	koala		C	V	8
animals	mammals	Potoroidae	<i>Aepyprymnus rufescens</i>	rufous bettong		C		2
animals	mammals	Pseudocheiridae	<i>Petauroides volans</i>	greater glider		C		1
animals	mammals	Suidae	<i>Sus scrofa</i>	pig	Y			1
animals	mammals	Tachyglossidae	<i>Tachyglossus aculeatus</i>	short-beaked echidna		C		1
animals	mammals	Vespertilionidae	<i>Chalinolobus picatus</i>	little pied bat		NT		1
animals	mammals	Vespertilionidae	<i>Chalinolobus gouldii</i>	Gould's wattled bat		C		3/2
animals	mammals	Vespertilionidae	<i>Scotorepens greyii</i>	little broad-nosed bat		C		3

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animals	mammals	Vespertilionidae	<i>Scotorepens balstoni</i>	inland broad-nosed bat		C		3
animals	reptiles	Agamidae	<i>Diporiphora australis</i>			C		1
animals	reptiles	Carphodactylidae	<i>Nephrurus asper</i>	spiny knob-tailed gecko		C		1/1
animals	reptiles	Chelidae	<i>Chelodina longicollis</i>	eastern snake-necked turtle		C		1
animals	reptiles	Diplodactylidae	<i>Oedura marmorata</i>	marbled velvet gecko		C		1/1
animals	reptiles	Diplodactylidae	<i>Oedura monilis</i>			C		4/2
animals	reptiles	Elapidae	<i>Demansia psammophis</i>	yellow-faced whip snake		C		1
animals	reptiles	Elapidae	<i>Furina diadema</i>	red-naped snake		C		1/1
animals	reptiles	Elapidae	<i>Pseudonaja textilis</i>	eastern brown snake		C		1
animals	reptiles	Elapidae	<i>Pseudechis australis</i>	king brown snake		C		3
animals	reptiles	Elapidae	<i>Demansia vestigiata</i>	black whip snake		C		1/1
animals	reptiles	Elapidae	<i>Cryptophis boschmai</i>	Carpentaria whip snake		C		1
animals	reptiles	Elapidae	<i>Suta suta</i>	myall snake		C		1
animals	reptiles	Gekkonidae	<i>Gehyra dubia</i>			C		1/1
animals	reptiles	Gekkonidae	<i>Heteronotia binoei</i>	Bynoe's gecko		C		8/1
animals	reptiles	Pygopodidae	<i>Lialis burtonis</i>	Burton's legless lizard		C		2
animals	reptiles	Scincidae	<i>Morethia boulengeri</i>			C		2/1
animals	reptiles	Scincidae	<i>Ctenotus taeniolatus</i>	copper-tailed skink		C		1
animals	reptiles	Scincidae	<i>Cryptoblepharus pannosus</i>	ragged snake-eyed skink		C		1
animals	reptiles	Scincidae	<i>Lygisaurus foliorum</i>			C		1
animals	reptiles	Scincidae	<i>Egernia rugosa</i>	yakka skink		V	V	1
animals	reptiles	Scincidae	<i>Egernia striolata</i>	tree skink		C		2/1
animals	reptiles	Scincidae	<i>Tiliqua scincoides</i>	eastern blue-tongued lizard		C		1
animals	reptiles	Scincidae	<i>Lerista fragilis</i>			C		3/2
animals	reptiles	Scincidae	<i>Ctenotus robustus</i>			C		1
animals	reptiles	Varanidae	<i>Varanus varius</i>	lace monitor		C		3
animals	reptiles	Varanidae	<i>Varanus gouldii</i>	sand monitor		C		2
animals	reptiles	Varanidae	<i>Varanus tristis</i>	black-tailed monitor		C		2/2
plants	conifers	Cupressaceae	<i>Callitris glaucophylla</i>	white cypress pine		C		3
plants	ferns	Adiantaceae	<i>Cheilanthes sieberi</i>			C		9
plants	ferns	Adiantaceae	<i>Doryopteris concolor</i>			C		2/1
plants	ferns	Marsileaceae	<i>Marsilea hirsuta</i>	hairy nardoo		C		1
plants	higher dicots	Acanthaceae	<i>Pseuderanthemum variabile</i>	pastel flower		C		3
plants	higher dicots	Acanthaceae	<i>Brunoniella australis</i>	blue trumpet		C		3
plants	higher dicots	Acanthaceae	<i>Rostellularia adscendens</i>			C		3
plants	higher dicots	Amaranthaceae	<i>Nyssanthes erecta</i>			C		1
plants	higher dicots	Amaranthaceae	<i>Alternanthera nodiflora</i>	joyweed		C		2/1
plants	higher dicots	Amaranthaceae	<i>Amaranthus mitchellii</i>	Boggabri weed		C		1/1
plants	higher dicots	Amaranthaceae	<i>Achyranthes aspera</i>			C		5
plants	higher dicots	Amaranthaceae	<i>Alternanthera</i>			C		1
plants	higher dicots	Amaranthaceae	<i>Ptilotus</i>			C		1
plants	higher dicots	Apocynaceae	<i>Parsonsia lanceolata</i>	northern silkpod		C		1
plants	higher dicots	Apocynaceae	<i>Alstonia constricta</i>	bitterbark		C		5
plants	higher dicots	Apocynaceae	<i>Carissa ovata</i>	currantbush		C		10
plants	higher dicots	Apocynaceae	<i>Parsonsia straminea</i>	monkey rope		C		1
plants	higher dicots	Apocynaceae	<i>Marsdenia viridiflora subsp. viridiflora</i>			C		1/1

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plants	higher dicots	Apocynaceae	<i>Marsdenia viridiflora</i>			C		1
plants	higher dicots	Araliaceae	<i>Astrotricha biddulphiana</i>			C		1
plants	higher dicots	Asteraceae	<i>Parthenium hysterophorus</i>	parthenium weed	Y			2/1
plants	higher dicots	Asteraceae	<i>Coronidium oxylepis subsp. lanatum</i>			C		1/1
plants	higher dicots	Asteraceae	<i>Wedelia spilanthis</i>			C		1
plants	higher dicots	Asteraceae	<i>Vittadinia</i>			C		1
plants	higher dicots	Asteraceae	<i>Brachyscome</i>			C		1
plants	higher dicots	Asteraceae	<i>Bidens pilosa</i>		Y			1
plants	higher dicots	Asteraceae	<i>Pluchea dunlopia</i>			C		1/1
plants	higher dicots	Asteraceae	<i>Coronidium rupicola</i>			C		1
plants	higher dicots	Asteraceae	<i>Euchiton sphaericus</i>			C		1
plants	higher dicots	Asteraceae	<i>Pterocaulon redolens</i>			C		1
plants	higher dicots	Asteraceae	<i>Cyanthillium cinereum</i>			C		2/1
plants	higher dicots	Asteraceae	<i>Leiocarpa brevicompta</i>			C		2/1
plants	higher dicots	Asteraceae	<i>Podolepis longipedata</i>	tall copper-wire daisy		C		1/1
plants	higher dicots	Bignoniaceae	<i>Pandorea pandorana</i>	wonga vine		C		1
plants	higher dicots	Boraginaceae	<i>Ehretia</i>			C		1
plants	higher dicots	Byttneriaceae	<i>Seringia corollata</i>			C		1
plants	higher dicots	Cactaceae	<i>Opuntia</i>		Y			3
plants	higher dicots	Cactaceae	<i>Opuntia stricta</i>		Y			2
plants	higher dicots	Cactaceae	<i>Opuntia tomentosa</i>	velvety tree pear	Y			1
plants	higher dicots	Cactaceae	<i>Cereus uruguayanus</i>		Y			1/1
plants	higher dicots	Caesalpiniaceae	<i>Senna artemisioides subsp. zygophylla</i>			C		1
plants	higher dicots	Caesalpiniaceae	<i>Lysiphyllum</i>			C		3
plants	higher dicots	Caesalpiniaceae	<i>Cassia brewsteri</i>			C		1/1
plants	higher dicots	Caesalpiniaceae	<i>Senna barclayana</i>			C		1
plants	higher dicots	Caesalpiniaceae	<i>Lysiphyllum hookeri</i>	Queensland ebony		C		2
plants	higher dicots	Campanulaceae	<i>Pratia concolor</i>	poison pratia		C		1
plants	higher dicots	Capparaceae	<i>Capparis loranthifolia</i>			C		1
plants	higher dicots	Capparaceae	<i>Apophyllum anomalum</i>	broom bush		C		1
plants	higher dicots	Capparaceae	<i>Capparis lasiantha</i>	nipan		C		4
plants	higher dicots	Casuarinaceae	<i>Casuarina cunninghamiana</i>			C		1
plants	higher dicots	Celastraceae	<i>Denhamia pittosporoides subsp. angustifolia</i>			C		1/1
plants	higher dicots	Celastraceae	<i>Denhamia oleaster</i>			C		1
plants	higher dicots	Chenopodiaceae	<i>Sclerolaena muricata var. muricata</i>			C		2
plants	higher dicots	Chenopodiaceae	<i>Einadia nutans subsp. linifolia</i>			C		2
plants	higher dicots	Chenopodiaceae	<i>Sclerolaena convexula</i>			C		1
plants	higher dicots	Chenopodiaceae	<i>Dysphania glomulifera</i>			C		2
plants	higher dicots	Chenopodiaceae	<i>Sclerolaena bicornis</i>			C		1
plants	higher dicots	Chenopodiaceae	<i>Maireana microphylla</i>			C		1
plants	higher dicots	Chenopodiaceae	<i>Enchylaena tomentosa</i>			C		3
plants	higher dicots	Chenopodiaceae	<i>Einadia polygonoides</i>	knotweed goosefoot		C		1/1
plants	higher dicots	Chenopodiaceae	<i>Atriplex eardleyae</i>			C		1/1
plants	higher dicots	Chenopodiaceae	<i>Atriplex muelleri</i>	lagoon saltbush		C		3
plants	higher dicots	Chenopodiaceae	<i>Salsola kali</i>			C		3
plants	higher dicots	Chenopodiaceae	<i>Einadia nutans</i>			C		5

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plants	higher dicots	Chenopodiaceae	<i>Einadia hastata</i>			C		2/1
plants	higher dicots	Chenopodiaceae	<i>Sclerolaena</i>			C		2
plants	higher dicots	Chenopodiaceae	<i>Maireana</i>			C		1
plants	higher dicots	Cleomaceae	<i>Cleome viscosa</i>	tick-weed		C		1/1
plants	higher dicots	Combretaceae	<i>Macropteranthus leichhardtii</i>	bonewood		C		3
plants	higher dicots	Combretaceae	<i>Terminalia oblongata</i>			C		1
plants	higher dicots	Convolvulaceae	<i>Ipomoea lonchophylla</i>			C		1/1
plants	higher dicots	Convolvulaceae	<i>Evolvulus alsinoides</i>			C		5
plants	higher dicots	Ebenaceae	<i>Diospyros humilis</i>	small-leaved ebony		C		4/1
plants	higher dicots	Erythroxylaceae	<i>Erythroxylum australe</i>	cocaine tree		C		5/1
plants	higher dicots	Erythroxylaceae	<i>Erythroxylum sp. (Splityard Creek L.Pedley 5360)</i>			C		4
plants	higher dicots	Euphorbiaceae	<i>Adriana urticoides var. urticoides</i>			C		1/1
plants	higher dicots	Euphorbiaceae	<i>Chamaesyce drummondii</i>	caustic-weed		C		4
plants	higher dicots	Euphorbiaceae	<i>Euphorbia stevenii</i>	bottle tree spurge		C		1/1
plants	higher dicots	Euphorbiaceae	<i>Euphorbia</i>			C		3
plants	higher dicots	Euphorbiaceae	<i>Acalypha eremorum</i>	soft acalypha		C		1
plants	higher dicots	Euphorbiaceae	<i>Ricinocarpus linearifolius</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Zornia</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Tephrosia</i>			C		1
plants	higher dicots	Fabaceae	<i>Cullen tenax</i>	emu-foot		C		1
plants	higher dicots	Fabaceae	<i>Crotalaria incana subsp. incana</i>		Y			1/1
plants	higher dicots	Fabaceae	<i>Desmodium rhytidophyllum</i>			C		2
plants	higher dicots	Fabaceae	<i>Zornia pallida</i>			NT		1/1
plants	higher dicots	Fabaceae	<i>Glycine cyrtoloba</i>			C		2
plants	higher dicots	Fabaceae	<i>Centrosema pascuorum</i>		Y			1/1
plants	higher dicots	Fabaceae	<i>Glycine tabacina</i>	glycine pea		C		1
plants	higher dicots	Fabaceae	<i>Hovea lanceolata</i>			C		4
plants	higher dicots	Goodeniaceae	<i>Goodenia paniculata</i>			C		2/1
plants	higher dicots	Goodeniaceae	<i>Goodenia rotundifolia</i>			C		1
plants	higher dicots	Haloragaceae	<i>Gonocarpus</i>			C		1
plants	higher dicots	Haloragaceae	<i>Gonocarpus elatus</i>			C		2/1
plants	higher dicots	Lamiaceae	<i>Ajuga australis</i>	Australian bugle		C		1
plants	higher dicots	Lamiaceae	<i>Basilicum polystachyon</i>			C		1
plants	higher dicots	Malvaceae	<i>Malvastrum coromandelianum</i>	prickly malvastrum	Y			1
plants	higher dicots	Malvaceae	<i>Hibiscus krichauffianus</i>			C		2
plants	higher dicots	Malvaceae	<i>Gossypium sturtianum</i>			C		1/1
plants	higher dicots	Malvaceae	<i>Sida atherophora</i>			C		3/1
plants	higher dicots	Malvaceae	<i>Hibiscus sturtii</i>			C		5
plants	higher dicots	Malvaceae	<i>Abutilon oxycarpum var. oxycarpum</i>			C		2/1
plants	higher dicots	Malvaceae	<i>Sida cordifolia</i>		Y			1
plants	higher dicots	Malvaceae	<i>Sida</i>			C		1
plants	higher dicots	Malvaceae	<i>Malvastrum americanum var. americanum</i>		Y			2
plants	higher dicots	Malvaceae	<i>Sida filiformis</i>			C		4
plants	higher dicots	Meliaceae	<i>Owenia acidula</i>	emu apple		C		1
plants	higher dicots	Mimosaceae	<i>Acacia julifera</i>			C		1
plants	higher dicots	Mimosaceae	<i>Acacia conferta</i>			C		1

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plants	higher dicots	Mimosaceae	<i>Acacia ixodes</i>			C		2/1
plants	higher dicots	Mimosaceae	<i>Acacia decora</i>	pretty wattle		C		1
plants	higher dicots	Mimosaceae	<i>Acacia</i>			C		3/2
plants	higher dicots	Mimosaceae	<i>Acacia salicina</i>	doolan		C		1
plants	higher dicots	Mimosaceae	<i>Acacia shirleyi</i>	lancewood		C		3
plants	higher dicots	Mimosaceae	<i>Acacia fodinalis</i>			C		5
plants	higher dicots	Mimosaceae	<i>Acacia catenulata</i>	bendee		C		2
plants	higher dicots	Mimosaceae	<i>Acacia farnesiana</i>	mimosa bush		C		1
plants	higher dicots	Mimosaceae	<i>Acacia harpophylla</i>	brigalow		C		8
plants	higher dicots	Mimosaceae	<i>Acacia longispicata</i>			C		4/4
plants	higher dicots	Mimosaceae	<i>Acacia bancroftiorum</i>			C		3/2
plants	higher dicots	Mimosaceae	<i>Archidendropsis basaltica</i>	red lancewood		C		1
plants	higher dicots	Mimosaceae	<i>Acacia cretata</i> x <i>A.fodinalis</i>			C		1/1
plants	higher dicots	Mimosaceae	<i>Leucaena leucocephala</i> subsp. <i>glabrata</i>		Y			1/1
plants	higher dicots	Mimosaceae	<i>Acacia</i> sp. (Comet L.Pedley 4091)			C		1
plants	higher dicots	Myoporaceae	<i>Eremophila maculata</i>			C		1
plants	higher dicots	Myoporaceae	<i>Eremophila mitchellii</i>			C		9
plants	higher dicots	Myoporaceae	<i>Eremophila latrobei</i>			C		1
plants	higher dicots	Myoporaceae	<i>Eremophila deserti</i>			C		3/2
plants	higher dicots	Myrtaceae	<i>Melaleuca trichostachya</i>			C		2/1
plants	higher dicots	Myrtaceae	<i>Eucalyptus melanophloia</i> subsp. <i>melanophloia</i>			C		1/1
plants	higher dicots	Myrtaceae	<i>Eucalyptus melanophloia</i>			C		3
plants	higher dicots	Myrtaceae	<i>Eucalyptus tholiformis</i>			C		2/1
plants	higher dicots	Myrtaceae	<i>Eucalyptus orgadophila</i>	mountain coolibah		C		2/1
plants	higher dicots	Myrtaceae	<i>Eucalyptus decorticans</i>			C		1
plants	higher dicots	Myrtaceae	<i>Corymbia erythrophloia</i>	variable-barked bloodwood		C		2/1
plants	higher dicots	Myrtaceae	<i>Eucalyptus thozetiana</i>			C		3
plants	higher dicots	Myrtaceae	<i>Eucalyptus microtheca</i>	coolibah		C		1
plants	higher dicots	Myrtaceae	<i>Eucalyptus cambageana</i>	Dawson gum		C		5/2
plants	higher dicots	Myrtaceae	<i>Corymbia leichhardtii</i>	rustyjacket		C		4
plants	higher dicots	Myrtaceae	<i>Melaleuca acacioides</i>			C		1/1
plants	higher dicots	Myrtaceae	<i>Eucalyptus populnea</i>	poplar box		C		1
plants	higher dicots	Myrtaceae	<i>Eucalyptus coolabah</i>	coolabah		C		2
plants	higher dicots	Myrtaceae	<i>Corymbia citriodora</i>	spotted gum		C		2
plants	higher dicots	Myrtaceae	<i>Eucalyptus crebra</i>	narrow-leaved red ironbark		C		2
plants	higher dicots	Myrtaceae	<i>Eucalyptus camaldulensis</i>			C		1
plants	higher dicots	Myrtaceae	<i>Corymbia</i>			C		1
plants	higher dicots	Myrtaceae	<i>Corymbia citriodora</i> subsp. <i>citriodora</i>			C		1/1
plants	higher dicots	Myrtaceae	<i>Leptospermum lamellatum</i>			C		3
plants	higher dicots	Nyctaginaceae	<i>Boerhavia pubescens</i>			C		1/1
plants	higher dicots	Oleaceae	<i>Jasminum didymum</i>			C		4
plants	higher dicots	Oxalidaceae	<i>Oxalis</i>			C		2/1
plants	higher dicots	Passifloraceae	<i>Passiflora aurantia</i>			C		1
plants	higher dicots	Pentapetaceae	<i>Melhania oblongifolia</i>			C		1
plants	higher dicots	Phyllanthaceae	<i>Phyllanthus virgatus</i>			C		3
plants	higher dicots	Phyllanthaceae	<i>Phyllanthus lacunarius</i>			C		1/1

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plants	higher dicots	Phyllanthaceae	<i>Sauropus trachyspermus</i>			C		1/1
plants	higher dicots	Phyllanthaceae	<i>Breynia oblongifolia</i>			C		1
plants	higher dicots	Phyllanthaceae	<i>Phyllanthus</i>			C		3
plants	higher dicots	Phyllanthaceae	<i>Bridelia leichhardtii</i>			C		1
plants	higher dicots	Picrodendraceae	<i>Petalostigma pubescens</i>	quinine tree		C		2
plants	higher dicots	Pittosporaceae	<i>Pittosporum spinescens</i>			C		1
plants	higher dicots	Pittosporaceae	<i>Bursaria incana</i>			C		2
plants	higher dicots	Polygonaceae	<i>Muehlenbeckia</i>			C		1
plants	higher dicots	Polygonaceae	<i>Muehlenbeckia florulenta</i>	lignum		C		1
plants	higher dicots	Portulacaceae	<i>Portulaca oleracea</i>	pigweed	Y			3
plants	higher dicots	Portulacaceae	<i>Portulaca</i>			C		1
plants	higher dicots	Proteaceae	<i>Grevillea floribunda subsp. floribunda</i>			C		1/1
plants	higher dicots	Rhamnaceae	<i>Alphitonia excelsa</i>	soap tree		C		8
plants	higher dicots	Rhamnaceae	<i>Ventilago viminalis</i>	supplejack		C		1
plants	higher dicots	Rubiaceae	<i>Psydrax oleifolia</i>			C		1
plants	higher dicots	Rubiaceae	<i>Everistia vacciniifolia</i>			C		1
plants	higher dicots	Rubiaceae	<i>Pogonolobus reticulatus</i>			C		1
plants	higher dicots	Rubiaceae	<i>Psydrax johnsonii</i>			C		1
plants	higher dicots	Rubiaceae	<i>Psydrax odorata</i>			C		1
plants	higher dicots	Rubiaceae	<i>Oldenlandia coerulescens</i>			C		1/1
plants	higher dicots	Rutaceae	<i>Flindersia dissosperma</i>			C		2/2
plants	higher dicots	Rutaceae	<i>Philotheca difformis subsp. difformis</i>			C		1/1
plants	higher dicots	Rutaceae	<i>Boronia foetida</i>			C		1/1
plants	higher dicots	Rutaceae	<i>Geijera parviflora</i>	wilga		C		3
plants	higher dicots	Sapindaceae	<i>Atalaya hemiglauca</i>			C		3
plants	higher dicots	Scrophulariaceae	<i>Scoparia dulcis</i>	Scoparia	Y			1
plants	higher dicots	Solanaceae	<i>Solanum semiaratum</i>	prickly nightshade		C		3
plants	higher dicots	Solanaceae	<i>Solanum parvifolium</i>			C		1
plants	higher dicots	Solanaceae	<i>Solanum ellipticum</i>	potato bush		C		8
plants	higher dicots	Solanaceae	<i>Solanum ferocissimum</i>			C		1/1
plants	higher dicots	Solanaceae	<i>Solanum seaforthianum</i>	Brazilian nightshade	Y			1
plants	higher dicots	Solanaceae	<i>Solanum mitchellianum</i>			C		1/1
plants	higher dicots	Sparrmanniaceae	<i>Grewia latifolia</i>	dysentery plant		C		3
plants	higher dicots	Sterculiaceae	<i>Brachychiton rupestris</i>			C		4
plants	higher dicots	Sterculiaceae	<i>Brachychiton australis</i>	broad-leaved bottle tree		C		2
plants	higher dicots	Sterculiaceae	<i>Brachychiton populneus subsp. trilobus</i>			C		1/1
plants	higher dicots	Violaceae	<i>Hybanthus monopetalus</i>			C		1
plants	higher dicots	Zygophyllaceae	<i>Roepera apiculata</i>			C		1
plants	monocots	Cyperaceae	<i>Eleocharis</i>			C		1
plants	monocots	Cyperaceae	<i>Fimbristylis</i>			C		1
plants	monocots	Cyperaceae	<i>Eleocharis philippinensis</i>			C		1/1
plants	monocots	Cyperaceae	<i>Scleria mackaviensis</i>			C		4
plants	monocots	Cyperaceae	<i>Scleria sphacelata</i>			C		3
plants	monocots	Cyperaceae	<i>Cyperus squarrosus</i>	bearded flatsedge		C		1/1
plants	monocots	Cyperaceae	<i>Cyperus clarus</i>			V		1/1
plants	monocots	Cyperaceae	<i>Cyperus fulvus</i>			C		2

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plants	monocots	Cyperaceae	<i>Schoenus kennyi</i>			C		2/1
plants	monocots	Cyperaceae	<i>Cyperus gracilis</i>			C		2
plants	monocots	Cyperaceae	<i>Cyperus procerus</i>			C		1/1
plants	monocots	Cyperaceae	<i>Cyperus rotundus</i>	nutgrass	Y			2/1
plants	monocots	Cyperaceae	<i>Cyperus bowmannii</i>			C		5
plants	monocots	Cyperaceae	<i>Cyperus exaltatus</i>	tall flatsedge		C		2/1
plants	monocots	Cyperaceae	<i>Cyperus dactyloides</i>			C		1/1
plants	monocots	Hemerocallidaceae	<i>Dianella longifolia</i>			C		1
plants	monocots	Laxmanniaceae	<i>Lomandra confertifolia</i>			C		1
plants	monocots	Laxmanniaceae	<i>Lomandra multiflora</i>			C		2
plants	monocots	Laxmanniaceae	<i>Lomandra longifolia</i>			C		4
plants	monocots	Laxmanniaceae	<i>Lomandra multiflora subsp. multiflora</i>			C		1/1
plants	monocots	Poaceae	<i>Paspalidium globoideum</i>	sago grass		C		1
plants	monocots	Poaceae	<i>Paspalidium jubiflorum</i>	warrego grass		C		1/1
plants	monocots	Poaceae	<i>Thyridolepis xerophila</i>			C		1/1
plants	monocots	Poaceae	<i>Ancistrachne uncinulata</i>	hooky grass		C		1
plants	monocots	Poaceae	<i>Dactyloctenium radulans</i>	button grass		C		1
plants	monocots	Poaceae	<i>Eragrostis megalosperma</i>			C		2
plants	monocots	Poaceae	<i>Eragrostis spartinoides</i>			C		1
plants	monocots	Poaceae	<i>Paspalidium caespitosum</i>	brigalow grass		C		3
plants	monocots	Poaceae	<i>Sporobolus actinocladus</i>	katoora grass		C		2
plants	monocots	Poaceae	<i>Paspalidium albobillosum</i>			C		4/1
plants	monocots	Poaceae	<i>Cymbopogon queenslandicus</i>			C		1
plants	monocots	Poaceae	<i>Thyridolepis mitchelliana</i>	mulga mitchell grass		C		1/1
plants	monocots	Poaceae	<i>Eriochloa pseudoacrotricha</i>			C		1/1
plants	monocots	Poaceae	<i>Aristida benthamii</i> var. <i>benthamii</i>			C		3
plants	monocots	Poaceae	<i>Chloris divaricata</i> var. <i>divaricata</i>	slender chloris		C		6
plants	monocots	Poaceae	<i>Dichanthium sericeum</i> subsp. <i>sericeum</i>			C		1/1
plants	monocots	Poaceae	<i>Aristida queenslandica</i> var. <i>dissimilis</i>			C		5
plants	monocots	Poaceae	<i>Panicum queenslandicum</i> var. <i>queenslandicum</i>			C		1/1
plants	monocots	Poaceae	<i>Panicum</i>			C		1
plants	monocots	Poaceae	<i>Sorghum</i>			C		1
plants	monocots	Poaceae	<i>Aristida</i>			C		5
plants	monocots	Poaceae	<i>Paspalum</i>			C		1
plants	monocots	Poaceae	<i>Cymbopogon</i>			C		1
plants	monocots	Poaceae	<i>Enneapogon</i>			C		2
plants	monocots	Poaceae	<i>Eragrostis</i>			C		1
plants	monocots	Poaceae	<i>Paspalidium</i>			C		1
plants	monocots	Poaceae	<i>Eulalia aurea</i>	silky browntop		C		1
plants	monocots	Poaceae	<i>Melinis repens</i>	red natal grass	Y			10
plants	monocots	Poaceae	<i>Aristida ramosa</i>	purple wiregrass		C		5/1
plants	monocots	Poaceae	<i>Chloris virgata</i>	feathertop rhodes grass	Y			2
plants	monocots	Poaceae	<i>Eriachne obtusa</i>			C		1
plants	monocots	Poaceae	<i>Panicum effusum</i>			C		3
plants	monocots	Poaceae	<i>Setaria surgens</i>			C		1
plants	monocots	Poaceae	<i>Eriochloa crebra</i>	spring grass		C		3

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plants	monocots	Poaceae	<i>Themeda triandra</i>	kangaroo grass		C		2
plants	monocots	Poaceae	<i>Entolasia stricta</i>	wiry panic		C		7
plants	monocots	Poaceae	<i>Sporobolus caroli</i>	fairy grass		C		6
plants	monocots	Poaceae	<i>Thellungia advena</i>	coolibah grass		C		1
plants	monocots	Poaceae	<i>Aristida benthamii</i>			C		1/1
plants	monocots	Poaceae	<i>Aristida holathera</i>			C		1
plants	monocots	Poaceae	<i>Aristida latifolia</i>	feathertop wiregrass		C		2
plants	monocots	Poaceae	<i>Aristida leptopoda</i>	white speargrass		C		2
plants	monocots	Poaceae	<i>Astrebla squarrosa</i>	bull mitchell grass		C		4/1
plants	monocots	Poaceae	<i>Chrysopogon fallax</i>			C		3
plants	monocots	Poaceae	<i>Eragrostis sororia</i>			C		4/1
plants	monocots	Poaceae	<i>Eriachne mucronata</i>			C		1
plants	monocots	Poaceae	<i>Pennisetum ciliare</i>			C		12
plants	monocots	Poaceae	<i>Triodia mitchellii</i>	buck spinifex		C		2/1
plants	monocots	Poaceae	<i>Aristida gracilipes</i>			C		1
plants	monocots	Poaceae	<i>Digitaria ammophila</i>	silky umbrella grass		C		1
plants	monocots	Poaceae	<i>Digitaria ramularis</i>			C		3
plants	monocots	Poaceae	<i>Enneapogon gracilis</i>	slender nineawn		C		1
plants	monocots	Poaceae	<i>Eragrostis speciosa</i>			C		2
plants	monocots	Poaceae	<i>Eriochloa fatmensis</i>			C		2
plants	monocots	Poaceae	<i>Leptochloa digitata</i>			C		1
plants	monocots	Poaceae	<i>Megathyrsus maximus</i>		Y			3
plants	monocots	Poaceae	<i>Paspalidium gracile</i>	slender panic		C		7
plants	monocots	Poaceae	<i>Tragus australianus</i>	small burr grass		C		1
plants	monocots	Poaceae	<i>Aristida longicollis</i>			C		1/1
plants	monocots	Poaceae	<i>Cymbopogon refractus</i>	barbed-wire grass		C		2
plants	monocots	Poaceae	<i>Dichanthium fecundum</i>	curly bluegrass		C		1
plants	monocots	Poaceae	<i>Dichanthium sericeum</i>			C		6
plants	monocots	Poaceae	<i>Digitaria parviflora</i>			C		5
plants	monocots	Poaceae	<i>Eragrostis lacunaria</i>	purple lovegrass		C		4
plants	monocots	Poaceae	<i>Leptochloa decipiens</i>			C		4
plants	monocots	Poaceae	<i>Panicum decompositum</i>			C		6
plants	monocots	Poaceae	<i>Sorghum x drummondii</i>		Y			1/1
plants	monocots	Poaceae	<i>Sporobolus scabridus</i>			C		1
plants	monocots	Poaceae	<i>Tripogon loliiformis</i>	five minute grass		C		1
plants	monocots	Poaceae	<i>Cymbopogon bombycinus</i>	silky oilgrass		C		1
plants	monocots	Poaceae	<i>Digitaria breviglumis</i>			C		1
plants	monocots	Poaceae	<i>Heteropogon contortus</i>	black speargrass		C		3
plants	monocots	Poaceae	<i>Iseilema vaginiflorum</i>	red flinders grass		C		1
plants	monocots	Poaceae	<i>Sporobolus mitchellii</i>	rat's tail couch		C		1/1
plants	monocots	Poaceae	<i>Alloteropsis semialata</i>	cockatoo grass		C		1
plants	monocots	Poaceae	<i>Aristida caput-medusae</i>			C		2
plants	monocots	Poaceae	<i>Bothriochloa ewartiana</i>	desert bluegrass		C		5/1
plants	monocots	Poaceae	<i>Enneapogon lindleyanus</i>			C		5/1
plants	monocots	Poaceae	<i>Enneapogon polyphyllus</i>	leafy nineawn		C		3/2
plants	monocots	Poaceae	<i>Enteropogon acicularis</i>	curly windmill grass		C		3

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	monocots	Poaceae	<i>Enteropogon unispiceus</i>			C		2
plants	monocots	Poaceae	<i>Panicum queenslandicum</i>			C		1

CODES

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

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

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

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

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

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

Appendix B Threatened Fauna Species – Habitat Requirements and
Likelihood of Occurrence



Scientific Name Common Name	Conservation Status		Habitat	Notes
	EPBC Act 1999	NCA 1992		
Birds				
<i>Accipiter novaehollandiae</i> Grey Goshawk	Not listed	Near Threatened	The grey goshawk inhabits rainforests, forested gullies and valleys, taller woodlands, timber on watercourses and open country during dispersal (Pizzey & Knight 2007).	Suitable habitat for this species occurs on the Project site and surrounding lands. Due to the abundance of similar habitat type surrounding the Project Site, if the species was present in the region, the Project is unlikely to impact on the species.
<i>Anseranas semipalmata</i> Magpie Goose	Marine	Not Listed	The magpie goose occupies large seasonal wetlands and well vegetated dams with rushes and sedges; wet grasslands and floodplains (Pizzey & Knight 2006).	Suitable habitat for this species occurs on the Project site. However, this species is not at its distributional range and the area is not known to be a significant foraging or breeding ground.
<i>Apus pacificus</i> Fork-tailed Swift	Migratory/Marine	Least Concern	Fork-tailed Swift breeds from central Siberia eastwards through Asia, spending boreal winter in northern Australia. Known to appear and forage for aerial insects over any habitat. They are strictly aerial when visiting Australia during the austral summer (Morcombe 2002).	May potentially occur over site but was not observed during the survey period. Development on site is unlikely to affect this species as it is strictly aerial remaining high above ground. Rarely if ever comes into contact with vegetation or land.
<i>Ardea alba</i> Great Egret, White Egret	Migratory/Marine	Least Concern	Common throughout Australia, with the exception of the most arid areas. Known to prefer shallow water, particularly when flowing, but may be seen on any watered area, including damp grasslands (Morcombe 2012).	Suitable habitat for this species occurs on Site. Given the abundance of similar habitat type surrounding the Project Site, if the species was present in the region, the Project is unlikely to impact on the species.

Scientific Name Common Name	Conservation Status		Habitat	Notes
	EPBC Act 1999	NCA 1992		
<i>Ardea ibis</i> Cattle Egret	Migratory/Marine	Least Concern	Widespread and common in north, north-eastern and south-eastern Australia. The species is found in grasslands, woodlands and wetlands, and is not common in arid areas. Utilises pastures and croplands, especially where drainage is poor. Will also forage in garbage dumps, and often associates with livestock (Morcombe 2012).	Suitable habitat occurs on Site, and surrounding lands. Given the presence of major watercourses and wetlands in the region, it is likely the species would prefer these sites. May benefit from human waste and livestock in the region. Overall, it is unlikely that the project would impact on this species.
<i>Ephippiorhynchus asiaticus</i> Black-necked Stork	Not Listed	Near Threatened	Prefers open freshwater environments, including the margins of swamps, shallow floodwaters over grasslands, wet shorelines, margins of mangroves, mudflats and estuaries (Morcombe 2002).	Limited habitat occurs on Project Site. Given the habitat associated with major watercourses and wetlands in the region, it is likely the species would prefer these sites.
<i>Erythrotriorchis radiatus</i> Red Goshawk	Vulnerable	Endangered	Inhabits undisturbed forest/woodland especially those adjacent to water bodies with large populations of birds. Hunts from a perch in dense foliage. Breeds in large eucalypts or melaleucas (Morcombe 2002).	Limited habitat occurs on Project Site. Due to the presence of large forest/woodland habitats occurring in association with Lake Maraboon to the south-east of the Project Site, it is considered unlikely that the project would impact on the species if it does occur in the region.
<i>Gallinago hardwickii</i> Latham's Snipe, Japanese Snipe	Migratory/Marine	Least Concern	Prefers low vegetation in swamps, salt marsh, heath, creek lines and irrigated cropland (Morcombe 2002).	The Project site provides limited areas of suitable habitat for this species. Given the abundance of suitable habitat in the region, the Project is not likely to impact on the species.
<i>Geophaps scripta scripta</i> Squatter Pigeon (southern)	Vulnerable	Vulnerable	This species occurs in dry grassy eucalypt woodlands and open forests, mostly in sandy sites near permanent water (Curtis et al. 2012)	The Project site lacks any permanent watercourses required to support a population in the long-term. The Project site may provide suitable habitat for this species during the wet season.

Scientific Name Common Name	Conservation Status		Habitat	Notes
	EPBC Act 1999	NCA 1992		
<i>Haliaeetus leucogaster</i> White-bellied Sea-eagle	Migratory/Marine	Least Concern	This species inhabits coastal and near coastal areas of northern and eastern Australia. Sometimes occur around inland drainages and large dams or lakes where sufficient prey (medium sized birds and fish) is available (Morcombe 2002).	Limited habitat on the Project Site. It is more likely that the species would occur in association with larger water bodies occurring in the region such as Nogoia river or Lake Maraboon where water and prey are readily available.
<i>Hirundapus caudacutus</i> White-throated Needletail	Migratory/Marine	Least Concern	This species occupies airspace over forests, woodlands, farmlands, plains, lakes, coasts, hilltops and timbered ranges (Pizzey & Knight 2006).	The subject site provides limited habitat for this species. It is more likely that this species occurs over the vast woodland habitats and the major wetland (i.e. Lake Maraboon) located to the south-east of the Project site.
<i>Melithreptus gularis</i> Black-chinned Honeyeater	Not Listed	Near Threatened	The black-chinned honeyeater occupies dry eucalypt woodland, particularly containing ironbark and box eucalypts as well as river red gum (Garnett <i>et al.</i> 2011).	Some suitable habitat may occur on the Project site however given the species range and the availability of similar habitat in the region it is unlikely the Project will adversely affect this species at a regional scale.
<i>Merops ornatus</i> Rainbow Bee-eater	Migratory/Marine	Least Concern	Common across mainland Australia. Seasonal movements from north to south during austral summer. Open woodland, forest clearings, semi-arid shrub land and grassland. Nests in long tunnel built into sandy soil or river bank (Morcombe 2002).	The Project site provides limited habitat for this species. It is highly likely that this species would occupy more suitable habitats in the region such as the banks of the Nogoia River.
<i>Myiagra cyanoleuca</i> Satin Flycatcher	Migratory/Marine	Least Concern	This species tends to inhabit heavily vegetated gullies in forests, taller woodlands. During migration, the satin flycatcher can be found in coastal forests, woodlands, mangroves, gardens and trees in open country (Pizzey & Knight 2006).	No suitable habitat occurs on the Project Site. Although individuals may occur sporadically along densely vegetated watercourses in region, the Project is not likely to impact on the species.

Scientific Name Common Name	Conservation Status		Habitat	Notes
	EPBC Act 1999	NCA 1992		
<i>Neochmia ruficauda</i> <i>ruficauda</i> Star Finch (eastern), Star Finch (southern)	Endangered	Endangered	The star finch is a very rare and nomadic granivore. Sightings have reduced significantly since white settlement. Found in rank vegetation along watercourses and swamps (Morcombe 2002).	Suitable habitat occurs in the region. While potential habitat for this species is present, the Project site lacks permanent watercourses. The project is unlikely to impact the species if it does occur in the region.
<i>Nettapus coromandelianus</i> Cotton Pygmy-goose	Not Listed	Near Threatened	Uncommon to rare vagrant across north-east Australia. Inhabits deep, permanent water bodies but may occupy floodplain pools during the wet season (Morcombe 2002).	Suitable habitat for this species occurs on the Project site and surrounding lands. Due to the abundance of similar habitat type surrounding the Project Site, if the species was present in the region, the Project is unlikely to impact on the species.
<i>Phaethon rubricauda</i> Red-tailed Tropicbird	Marine	Vulnerable	The red-tailed tropicbird is restricted to marine environments and breeds on offshore islands.	Individuals may be blown inland after periodical cyclone events but there is no suitable habitat available on the Project Site.
<i>Rostratula australis</i> Australian Painted Snipe	Vulnerable/ Migratory/Marine	Vulnerable	This species inhabits shallow inland wetlands, either permanent or temporary (Marchant and Higgins 1993).	Suitable habitat for this species occurs on the Project site. Due to the abundance of similar habitat type surrounding the Project Site, if the species was present in the region, the Project is unlikely to impact on the species.
<i>Tadorna radjah</i> Radjah Shelduck	Not Listed	Near Threatened	During the wet season the Radjah shelduck will occupy most shall waters including freshwater, saltwater and brackish swamps, mangrove lined coastal creeks and shallow river margins. During the dry season, the species tends to populate around larger permanent lagoons, paperbark swamps, man-made wetlands, mangroves, tidal flats and estuaries (Pizzey & Knight 2006).	Although suitable habitat for this species occurs on the Project site, the site occurs beyond the limit of the species distribution and it is therefore considered unlikely that this species occurs on the Project site.

Scientific Name Common Name	Conservation Status		Habitat	Notes
	EPBC Act 1999	NCA 1992		
Mammals				
<i>Dasyurus hallucatus</i> Northern Quoll	Endangered	Least Concern	Declined over range, now restricted to isolated populations across the north. Locally common in the Carnarvon range-Bowen area in rocky <i>Eucalyptus</i> woodland. May occur in other woodland and forest types (Menkhorst and Knight 2011).	Due to the current high disturbance and fragmentation of the Project Site, little suitable habitat is present. Targeted searches were carried out for this species but no evidence was found.
<i>Nyctophilus timoriensis</i> Greater Long-eared Bat, South-eastern Long-eared Bat (south-eastern form)	Vulnerable	Vulnerable	South-eastern form found through inland NSW and inland southern QLD. Roosts in tree hollows or decorticating bark. Forages in vegetation below canopy.	The Project site provides limited habitat as a result of previous disturbances that have led to a lack of roosting habitat.
Reptiles				
<i>Acanthophis antarcticus</i> Common Death Adder	Not Listed	Near Threatened	Death adders occur where intact shrub and leaf litter layers are present (Wilson 2009).	The Project site lacks areas of deep leaf litter, a habitat value that this species depends on. Lands to the south-east of the Project site may provide suitable habitat in association with existing woodland habitats. However, it is unlikely that the project will impact on this species.
<i>Delma torquata</i> Collared Delma	Vulnerable	Vulnerable	Restricted to south-east Queensland, north-west to Blackdown tableland and inland to Roma. Shelters in leaf litter and beneath logs and rocks. Occurs in rocky areas within dry open forest and brigalow (Wilson & Swan 2008).	As a result of previous clearing and agricultural disturbances, the Project site now contains small fragmented areas of potential habitat for this species.

Scientific Name Common Name	Conservation Status		Habitat	Notes
	EPBC Act 1999	NCA 1992		
<i>Denisonia maculata</i> Ornamental Snake	Vulnerable	Vulnerable	This species occurs in Brigalow woodlands growing on clay and sandy soils, riverside woodland, and open forest growing on natural levees (Shine 1983), showing a preference for moist areas (Wilson and Knowles 1988).	The Project site provides suitable habitat for this species. However, given the presence of Lake Maraboon and associated woodlands to the south-east of the Project site, it is highly likely that this species would prefer these habitats. In the event that the species does occur in the region, it is unlikely that the project would impact on the species.
<i>Egernia rugosa</i> Yakka Skink	Vulnerable	Vulnerable	Occurs in south-eastern, central and north-east Queensland. Lives communally in logs, rock crevices, beneath rocks and in burrows. Inhabits dry open forests, woodlands and rocky areas.	Previous activities on the Project site have resulted in extensive disturbance, fragmentation, and a subsequent lack suitable habitat for this species. It is possible this species may inhabit the Project site. The Project site is not expected to have any impacts on this species or its habitat.
<i>Furina dunmalli</i> Dunmall's Snake	Vulnerable	Vulnerable	Restricted to central south-eastern QLD. Inhabits Brigalow but has suffered decline across its range, possibly because of decline in brigalow. Prey on <i>Egernia striata</i> (Wilson and Swan 2008).	Restricted areas of suitable habitat occur in association with watercourses on the Project site. Due to the abundance of similar habitat type surrounding the Project site, if the species was present in the region, the Project is unlikely to impact on the species.
<i>Hemiaspis damelii</i> Grey Snake	Not Listed	Endangered	This species shows preference for cracking flood-prone soils in the Brigalow Belt, extending to Lockyer Valley in Southeast Queensland and the north-east interior of NSW. It shelters in soil cavities and beneath well-insulated debris (Wilson 2005).	Suitable habitat for this species occurs on the Project site. Due to the abundance of similar habitat type surrounding the Project Site, if the species was present in the region, the Project is unlikely to impact on the species.

Scientific Name Common Name	Conservation Status		Habitat	Notes
	EPBC Act 1999	NCA 1992		
<i>Lerista allanae</i> Allan's Lerista	Endangered	Endangered	This species' distribution is restricted to the area between Clermont and Capella (Couper & Ingram 1992). It occurs in grass tussocks on heavy-clay soil. There are no recent records despite thorough searches throughout range (Wilson & Swan 2008)	It is unlikely that this species occurs on the Project site.
<i>Paradelma orientalis</i> Brigalow Scaly-foot	Vulnerable	Vulnerable	Restricted to SE Queensland. Shelters in grass tussocks and leaf litter and beneath logs and sandstone. Occurs on sandstone ridges and in woodlands, brigalow and vine thickets (Wilson & Swan 2008).	Due to high disturbance, fragmentation, and a lack of rocky habitat or fallen debris there is limited suitable habitat for this species on the Project Site.
<i>Rheodytes leukops</i> Fitzroy River Turtle	Vulnerable	Vulnerable	This species is found in rivers within the Fitzroy Catchment with large deep pools with rocky, gravelly or sandy substrates, connected by shallow riffles. Preferred areas have high water clarity, and are often associated with Ribbonweed (<i>Vallisneria</i> sp.) beds (Cogger et al. 2000).	Suitable habitat for this species does not occur on the Project site. This species is not considered likely to occur on site.
<i>Strophurus taenicauda</i> Golden-tailed Gecko	Not Listed	Near Threatened	The golden-tailed gecko is endemic to the brigalow belt region and occupies dry sclerophyll forests comprising ironbark eucalypts, cypress pine and brigalow. This arboreal species shelters behind loose bark and in tree hollows (Wilson 2009).	Due to the extent of disturbance and fragmentation across the Project site, there is limited habitat available for this species. Given the abundance of similar habitat type surrounding the Project Site, if the species was present in the region, the Project is unlikely to impact on the species.



Scientific Name Common Name	Conservation Status		Habitat	Notes
	EPBC Act 1999	NCA 1992		
Amphibians				
<i>Cyclorana verrucosa</i> Rough Collared Frog	Not Listed	Near Threatened	The rough-collared frog occurs near seasonal ponds, creeks, and claypans in open country (Tyler & Knight 2011)	Suitable habitat for this species occurs on the Project site and surrounding lands. Given the abundance of ponds and creeks on lands surrounding the Project Site, the Project is unlikely to have a significant impact on the species.



Appendix C Flora Secondary and Quaternary Transect Proformas



AARC FLORA SURVEY PROFORMA

Secondary Transect

Project	
Date	
Recorder	
Site No.	
GPS Coordinates	
Site Photo No.	

Locality	
Site Context	
RE	
General Notes	

Altitude	Erosion Pattern	Slope (°)	Aspect

Soil Description	
Geology	
Additional Soil Notes	

Disturbance Severity (1 = minor 2 = moderate 3 = severe)							
Storm Damage							
Road Works							
Fire							
Clearing							
Grazing							
Weeds							
Other							
Height (m)	Emergent	T1	T2	T3	S1	S2	Ground

Stem Cover (Bitterlich Method)	
---------------------------------------	--



AARC FLORA SURVEY PROFORMA

Quaternary Transect

Project	
Date	
Recorder	
Site No.	
GPS Coordinates	
Site Photo No.	
RE	
Notes	

[illegible]

Appendix D Fauna Survey Site Descriptions



Dry Season

Site FS01 (Photo Plate 17) was located adjacent to a sandy, dry creek bed. The canopy was dominated by River Teatree (*Melaleuca bracteata*) and Coolabah (*Eucalyptus coolabah*). The ground layer was disturbed by grazing and dominated by the introduced species Buffel Grass (*Cenchrus ciliaris*). Site habitat features included fallen logs and small hollows in the Coolabah trees. Surveying was conducted at this site using a combination of Elliot, pitfall and funnel traps.



Photo Plate 17 Site FS01

Site FS02 (Photo Plate 18) was located in riverine open woodland dominated by Dawson Gum and Forest Red Gum (*Eucalyptus tereticornis*). Ground cover and shrubs at the site were mainly introduced, including Buffel Grass and the declared weeds Parthenium (*Parthenium hysterophorus*), Parkinsonia (*Parkinsonia aculeata*) and Fireweed (*Senecio madagascariensis*). Elliot trapping, pitfall trapping, funnel trapping and spotlighting were conducted at this site.



Photo Plate 18 Site FS02

Site FS03 (Photo Plate 19) was located in Lancewood (*Acacia shirleyi*) woodland on a stony ridgeline. A sparse ground cover of native grasses was present at this site. A combination of Elliot traps, pitfall traps, funnel traps and spotlighting were used to assess fauna diversity at this site.



Photo Plate 19 Site FS03

Site FS04 (Photo Plate 20) was located in an area of lacustrine wetland. This site had been heavily grazed and the ground was eroded. All the trees at this site were dead and provided habitat in the form of small hollows. Ground cover was dominated by Buffel Grass. Pitfall trapping, Elliot trapping and funnel trapping were used at site FS04.



Photo Plate 20 Site FS04

Site FS05 (Photo Plate 21) was an area of regrowth Moreton Bay Ash (*Corymbia tessellaris*) and Acacia open woodland. The ground had good coverage of native species and a sparse layer of native shrubs. Fallen logs were abundant at site FS05. Elliot traps, funnel traps and pitfall traps were deployed at this site.



Photo Plate 21 Site FS05

Wet Season

Site FS01 (Photo Plate 22) was located on the edge of a patch of remnant vegetation, near a track. The vegetation was dominated by a discontinuous canopy of Dawson Gum with a sparse understory of False Sandalwood (*Eremophila mitchellii*), Wilga (*Geijera parviflora*), Currant Bush (*Carissa ovata*) and grasses. A small number of tree hollows and fallen logs were observed at the site. Parts of the site were cleared and it was used for grazing. Elliot trapping, pitfall trapping, funnel trapping, spotlighting and bat detection were conducted at this site.



Photo Plate 22 Site FS01

Site FS02 was an area of grassland close to a creek. A small number of Poplar Box (*Eucalyptus populnea*) trees were present on site. Groundcover was dominated by Buffel Grass. Most of the site was cleared and it was used for grazing. A few native shrubs (predominantly Currant Bush) and fallen logs were present. Pitfall traps, funnel traps, Elliot traps and an AnaBat were all deployed at this site.

Site FS03 was a heavily disturbed site with a creek and track running through it. Dieback and grazing activity were noted in this area. The vegetation was dominated by introduced grass species, including Buffel Grass and Red Natal Grass (*Melinis repens*). Habitat features including fallen logs, branches and hollows were observed at site FS03. Elliot trapping, pitfall trapping, funnel trapping, spotlighting and bat detection were conducted at this site.

Site FS04 (Photo Plate 23) was located approximately 600 m from a creek, in a cleared area dominated by Buffel Grass. The site was used for grazing. A sparse cover of native shrubs and fallen logs was present. Pitfall traps, funnel traps, Elliot traps and an AnaBat were used at this site.



Photo Plate 23 Site FS04

Site FS05 (Photo Plate 24) was located in a cleared area dominated by Buffel Grass, adjacent to a dam. The site was used for grazing and stock watering. Pitfall traps, funnel traps, Elliot traps and an AnaBat were used at this site.



Photo Plate 24 Site FS05

Appendix E Flora Species List



Family	Species Name	Common Name	EPBC Act Status	NC Act Status	Weed/ Declared status	Sampling Site																											
						Wet Season Survey												Dry Season Survey															
						FT01	FT02	FT04	FT05	FT06	FT07	FT08	FT09	FT10	FT11	FT13	OPPS	FT1	FT2	FT3	FT4	FT5	FT6	FT7	FT8	FT9	FT10	FT11	Opps				
Acanthaceae	<i>Brunoniella australis</i>	Blue Trumpet										X																					
Aizoaceae	<i>Trianthema portulacastrum</i>	Black Pigweed			*																												
Amaranthaceae	<i>Achyranthes aspera</i>	Prickly Chaff Flower																X								X							
Amaranthaceae	<i>Alternanthera nodiflora</i>	Common Joyweed																										X					
Apiaceae	<i>Cyclospermum leptophyllum</i>	Slender Celery			*																			X									
Apocynaceae	<i>Asclepias curassavica</i>	Red-head Cottonbush			*																							X					
Apocynaceae	<i>Carissa ovata</i>	Currant Bush				X	X			X	X			X	X	X		X	X			X	X			X	X						
Apocynaceae	<i>Parsonsia lanceolata</i>	Rough Silkpod																										X					
Asteraceae	<i>Bidens pilosa</i>	Cobbler's Pegs			*															X													
Asteraceae	<i>Calotis cuneifolia</i>	Burr Daisy										X			X		X											X					
Asteraceae	<i>Centipeda borealis</i>																											X					
Asteraceae	<i>Chrysocephalum apiculatum</i>	Yellow Buttons										X																					
Asteraceae	<i>Conyza bonariensis</i>	Flaxleaf Fleabane			*		X																										
Asteraceae	<i>Cyanthillium cinereum</i>																	X								X		X					
Asteraceae	<i>Eclipta prostrata</i>	White Eclipta																															
Asteraceae	<i>Epaltes australis</i>	Spreading Nut-heads																										X					
Asteraceae	<i>Minuria integerrima</i>	Smooth Minuria																										X					
Asteraceae	<i>Parthenium hysterophorus</i>	Parthenium Weed			C2				X				X		X																		
Asteraceae	<i>Podolepis</i>	Tall Copper-wire																										X					

Casuarinaceae	<i>Casuarina cristata</i>	Belah										X	X	X															
Casuarinaceae	<i>Casuarina cunninghamiana</i>	River She-oak																				X							
Celastraceae	<i>Denhamia oleaster</i>																X			X					X				
Celastraceae	<i>Elaeodendron australe</i> var. <i>integrifolium</i>																												X
Chenopodiaceae	<i>Einadia nutans</i> subsp. <i>linifolia</i>															X													
Chenopodiaceae	<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>																X				X								
Chenopodiaceae	<i>Maireana coronata</i>																												X
Chenopodiaceae	<i>Salsola kali</i>	Roly-poly			*																			X					
Combretaceae	<i>Terminalia oblongata</i> subsp. <i>oblongata</i>	Yellow Wood								X				X	X	X													
Commelinaceae	<i>Commelina diffusa</i>	Native Wandering Jew																					X						
Convolvulaceae	<i>Convolvulus graminetus</i>																												
Convolvulaceae	<i>Dichondra repens</i>	Kidney Weed														X													
Convolvulaceae	<i>Evolvulus alsinoides</i>						X					X	X																
Convolvulaceae	<i>Ipomoea</i> sp.																												X
Convolvulaceae	<i>Polymeria</i> sp.								X																				
Cupressaceae	<i>Callitris glaucophylla</i>	White Cypress Pine									X							X											
Cyperaceae	<i>Cyperus concinnus</i>	Trim Flat-sedge																											X
Cyperaceae	<i>Cyperus dactylotes</i>																												
Cyperaceae	<i>Cyperus exaltatus</i>	Giant Sedge																											X
Cyperaceae	<i>Cyperus fulvus</i>	Sticky Sedge					X																						
Cyperaceae	<i>Cyperus gracilis</i>	Slender Flat-sedge																											
Cyperaceae	<i>Cyperus javanicus</i>																												

Mimosaceae	<i>Acacia holosericea</i>	Soap Bush									X				X							X				X		
Mimosaceae	<i>Acacia oswaldii</i>	Miljee										X			X													
Mimosaceae	<i>Acacia salicina</i>	Native Willow																						X				
Mimosaceae	<i>Acacia shirleyi</i>	Lancewood																									X	
Mimosaceae	<i>Acacia sparsiflora</i>	Currawong																										X
Moraceae	<i>Ficus coronata</i>	Creek Sandpaper Fig																										
Moraceae	<i>Ficus opposita</i>	Sandpaper Fig																						X				
Myoporaceae	<i>Eremophila</i> sp.																X		X		X		X			X		
Myoporaceae	<i>Eremophila longifolia</i>	Dogwood								X		X											X					X
Myoporaceae	<i>Eremophila mitchellii</i>	False Sandalwood								X				X		X		X	X				X					
Myrtaceae	<i>Corymbia citriodora</i>	Lemon-scented Gum																										X
Myrtaceae	<i>Corymbia dallachiana</i>										X		X															
Myrtaceae	<i>Corymbia intermedia</i>	Pink Bloodwood																										X
Myrtaceae	<i>Corymbia tessellaris</i>	Moreton Bay Ash																X	X	X	X							
Myrtaceae	<i>Eucalyptus camaldulensis</i> subsp. <i>acuta</i>	River Red Gum																						X				
Myrtaceae	<i>Eucalyptus cambageana</i>	Blackbutt					X	X											X	X				X		X		
Myrtaceae	<i>Eucalyptus coolabah</i>	Coolabah												X														
Myrtaceae	<i>Eucalyptus crebra</i>	Narrow-leaved Ironbark																									X	
Myrtaceae	<i>Eucalyptus melanophloia</i>	Silver-leaved Ironbark								X	X				X	X					X	X						
Myrtaceae	<i>Eucalyptus moluccana</i>	Gum-topped Box												X														
Myrtaceae	<i>Eucalyptus populnea</i>	Poplar Box						X				X	X		X			X			X							

Myrtaceae	<i>Eucalyptus tereticornis</i>	Forest Red Gum									X								X								X		
Myrtaceae	<i>Melaleuca bracteata</i>	Black Teatree									X		X												X		X		
Myrtaceae	<i>Melaleuca viminalis</i>	Weeping Bottlebrush																											X
Oleaceae	<i>Jasminum didymum</i> subsp. <i>lineare</i>																												X
Onagraceae	<i>Ludwigia octovalvis</i>	Willow Primrose																											X
Oxalidaceae	<i>Oxalis perennans</i>																												X
Poaceae	<i>Aristida benthamii</i> var. <i>spinulifera</i>						X																						
Poaceae	<i>Aristida latifolia</i>	Feathertop Wiregrass													X														
Poaceae	<i>Aristida lazardis</i>									X	X																		
Poaceae	<i>Astrebla squarrosa</i>	Bull Mitchell Grass																											X
Poaceae	<i>Bothriochloa decipiens</i> var. <i>decipiens</i>						X																						
Poaceae	<i>Bothriochloa ewartiana</i>	Desert Bluegrass							X																				
Poaceae	<i>Brachyachne tenella</i>	Slender Native Couch																											X
Poaceae	<i>Capillipedium spicigerum</i>	Spicytop							X			X		X															
Poaceae	<i>Cenchrus ciliaris</i>	Buffel Grass			*	X	X	X		X	X	X	X	X	X	X		X	X			X	X	X	X		X	X	
Poaceae	<i>Chloris divaricata</i> var. <i>divaricata</i>	Slender Chloris				X	X										X	X	X										
Poaceae	<i>Chloris gayana</i>	Rhodes Grass			*	X											X								X				X
Poaceae	<i>Chloris inflata</i>	Purpletop Chloris			*	X	X																						
Poaceae	<i>Chloris truncata</i>	Windmill Grass				X																							
Poaceae	<i>Chloris virgata</i>	Feathertop Rhodes Grass																											
Poaceae	<i>Cleistochloa subjuncea</i>																												X

Poaceae	<i>Cymbopogon refractus</i>	Barbed Wire Grass					X																						
Poaceae	<i>Cynodon dactylon</i> var. <i>dactylon</i>	Couch						X																					
Poaceae	<i>Dactyloctenium radulans</i>	Button Grass																											
Poaceae	<i>Dichanthium aristatum</i>	Angleton Grass			*									X															
Poaceae	<i>Dicanthium fecundum</i>	Curly Bluegrass																										X	
Poaceae	<i>Dichanthium sericeum</i> subsp. <i>humilius</i>	Annual Bluegrass																										X	
Poaceae	<i>Dichanthium sericeum</i> subsp. <i>sericeum</i>	Queensland Bluegrass													X														
Poaceae	<i>Digitaria brownii</i>									X																			
Poaceae	<i>Digitaria ciliaris</i>	Summer Grass			*																								
Poaceae	<i>Echinochloa colona</i>	Awnless Barnyard Grass			*	X				X	X	X		X															
Poaceae	<i>Elionurus citreus</i>	Lemon-scented Grass															X									X			
Poaceae	<i>Elionurus citreus</i>	Conetop Nineawn					X											X		X									
Poaceae	<i>Enneapogon pallidus</i>																											X	
Poaceae	<i>Enteropogon acicularis</i>	Curly Windmill Grass																										X	
Poaceae	<i>Eragrostis elongata</i>	Clustered Lovegrass					X																						
Poaceae	<i>Eragrostis lacunaria</i>	Purple Lovegrass					X					X					X	X		X					X				
Poaceae	<i>Eragrostis sororia</i>																			X									
Poaceae	<i>Eriochloa crebra</i>	Spring Grass							X																				
Poaceae	<i>Eriochloa fatmensis</i>	Tropical Cupgrass																										X	
Poaceae	<i>Eriochloa procera</i>	Spring Grass																										X	

Poaceae	<i>Heteropogon contortus</i>	Black Speargrass								X	X	X		X		X		X	X							X			
Poaceae	<i>Leptochloa decipiens</i> subsp. <i>decipiens</i>																												
Poaceae	<i>Leptochloa decipiens</i> subsp. <i>peacockii</i>						X																						
Poaceae	<i>Leptochloa digitata</i>	Umbrella Canegrass						X																					X
Poaceae	<i>Melinis repens</i>	Red Natal Grass			*		X				X	X						X	X		X				X	X			X
Poaceae	<i>Moorochloa eruciformis</i>	Sweet Signal Grass			*																								X
Poaceae	<i>Panicum decompositum</i> var. <i>decompositum</i>							X																					
Poaceae	<i>Panicum decompositum</i> var. <i>tenuius</i>									X	X																		
Poaceae	<i>Panicum effusum</i>	Hairy Panic																						X					
Poaceae	<i>Paspalidium</i> sp.																			X									
Poaceae	<i>Paspalum distichum</i>	Water Couch			*																								
Poaceae	<i>Perotis rara</i>	Comet Grass									X																		
Poaceae	<i>Setaria</i> sp.																												X
Poaceae	<i>Setaria australiensis</i>	Scrub Pigeon Grass															X												
Poaceae	<i>Sorghum X alnum</i>	Sorghum			*																								X
Poaceae	<i>Sorghum halepense</i>	Johnson Grass			*				X																				
Poaceae	<i>Sporobolus australasicus</i>	Australian Dropseed										X																	
Poaceae	<i>Themeda triandra</i>	Kangaroo Grass					X			X								X									X		
Poaceae	<i>Urochloa mosambicensis</i>	Sabi Grass			*		X																						
Polygonaceae	<i>Muehlenbeckia florulenta</i>	Lignum						X																					

Polygonaceae	<i>Persicaria attenuata</i> subsp. <i>attenuata</i>								X																				
Polygonaceae	<i>Persicaria orientalis</i>	Princes Feathers																											X
Proteaceae	<i>Grevillea striata</i>	Beefwood										X																	
Rhamnaceae	<i>Alphitonia excelsa</i>	Red Ash									X										X					X			
Rubiaceae	<i>Psydrax forsteri</i>																												X
Rutaceae	<i>Geijera parviflora</i>	Wilga				X				X					X							X					X		
Sapindaceae	<i>Alectryon diversifolius</i>	Holly Bush											X		X														
Sapindaceae	<i>Atalaya hemiglauca</i>	Whitewood																											X
Sapindaceae	<i>Dodonaea viscosa</i> subsp. <i>spathulata</i>																X									X			
Scrophulariaceae	<i>Mimulus gracilis</i>	Slender Monkey Flower																											X
Solanaceae	<i>Physalis lanceifolia</i>								X																				
Sparrmanniaceae	<i>Corchorus trilocularis</i>	Wild Jute									X					X													
Sterculiaceae	<i>Brachychiton populneus</i>	Kurrajong																											X
Thymelaeaceae	<i>Pimelea haematostachya</i>	Pimelea Poppy																											X
Verbenaceae	<i>Lantana camara</i>	Lantana			*																								
Verbenaceae	<i>Verbena africana</i>							X																					
Verbenaceae	<i>Verbena gaudichaudii</i>																												X
Violaceae	<i>Hybanthus enneaspermus</i>	Spade Flower										X																	

Key:

NC Act	=	Nature Conservation Act 1992
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LC	=	Least Concern
NT	=	Near Threatened
V	=	Vulnerable
E	=	Endangered
*	=	Introduced species
C1	=	Class 1 declared pest under the <i>Land Protection (Pest and Stock Route Management) Act 2002</i>
C2	=	Class 2 declared pest under the <i>Land Protection (Pest and Stock Route Management) Act 2002</i>



Appendix F Fauna Species List



Common Name	Species Name	Status	Dry Season								Wet Season						Supplementary Survey					
			Site 1	Site 2	Site 3	Site 4	Site 5	Dam 1	Dam 2	Opps	Site 1	Site 2	Site 3	Site 4	Site 5	Opps	Opps	AnaBat 1	AnaBat 2	AnaBat 3	AnaBat 5	AnaBat 6
BIRDS																						
Emu	<i>Dromaius novaehollandiae</i>									X												
Brown Quail	<i>Coturnix ypsilophora</i>									X												
Black Swan	<i>Cygnus atratus</i>							X		X					X							
Pacific Black Duck	<i>Anas platyrhynchos</i>			X		X		X	X	X					X							
Plumed Whistling Duck	<i>Dendrocygna cytoni</i>							X	X	X					X							
Hardhead	<i>Aythya australis</i>							X	X	X												
Great Crested Grebe	<i>Poliiocephalus poliocephalus</i>							X														
Australasian Grebe	<i>Tachybaptus novaehollandiae</i>					X		X		X						X						
Darter	<i>Anhinga melanogaster</i>					X			X	X												
Australasian Darter	<i>Anhinga novaehollandiae</i>					X		X	X													
Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>								X													
Pied Cormorant	<i>Phalacrocorax varius</i>					X		X		X												
Australian Pelican	<i>Pelecanus conspicillatus</i>								X													
White-necked Heron	<i>Ardea pacifica</i>									X												
White-faced Heron	<i>Egretta novaehollandiae</i>					X				X												
Cattle Egret	<i>Ardea ibis</i>	M				X																
Intermediate Egret	<i>Ardea intermedia</i>					X		X		X												
Straw-necked Ibis	<i>Threkiornis spinicollis</i>					X			X	X							X					
Black-	<i>Elanus axillaris</i>		X			X				X						X	X					

shouldered Kite																						
Whistling Kite	<i>Haliastur sphenurus</i>								X	X							X					
Little Eagle	<i>Hieraaetus morphnoides</i>									X						X						
Wedge-tailed Eagle	<i>Aquila audax</i>				X	X				X						X						
Brown Falcon	<i>Falco berigora</i>									X												
Nankeen Kestrel	<i>Falco cenchroides</i>					X					X						X					
Brolga	<i>Grus rubicundus</i>					X		X	X	X							X					
Dusky Moorhen	<i>Gallinula tenebrosa</i>							X		X												
Eurasian Coot	<i>Fulica atra</i>					X		X														
Australian Bustard	<i>Ardeotis australis</i>					X				X						X						
Red-kneed Dotterel	<i>Erythronyctes alba</i>					X																
Masked Lapwing	<i>Vanellus miles</i>					X		X		X						X						
Banded Lapwing	<i>Vanellus tricolor</i>									X												
Peaceful Dove	<i>Geopelia striata</i>		X							X				X								
Bar-shouldered Dove	<i>Geopelia humeralis</i>									X						X						
Crested Pigeon	<i>Ocyphaps lophotes</i>		X	X			X			X	X											
Galah	<i>Eolophus roseicapillus</i>		X		X	X				X					X	X						
Sulphur-crested Cockatoo	<i>Cacatua galerita</i>		X	X	X	X	X	X		X		X			X	X						
Red-winged Parrot	<i>Aprosmictus erythropterus</i>		X	X	X	X	X			X		X		X		X						
Cockatiel	<i>Nymphicus hollandicus</i>					X				X			X			X	X					
Pale-headed Rosella	<i>Platycercus adscitus</i>		X	X	X					X		X				X	X					
Rainbow Lorikeet	<i>Trichoglossus haematodus</i>			X																		

Pheasant Coucal	<i>Centropus phasianinus</i>			X						X					X							
Sacred Kingfisher	<i>Todiramphus sanctus</i>		X																			
Laughing Kookaburra	<i>Dacelo novaeguineae</i>		X				X			X							X					
Variegated Fairy-wren	<i>Malurus lamberti</i>			X				X		X					X							
Red-backed Fairy-wren	<i>Malurus melanocephalus</i>			X	X					X		X	X	X	X		X					
Superb Fairy-wren	<i>Malurus cyaneus</i>			X					X													
Red-capped Robin	<i>Petroica goodenovii</i>																X					
Striated Pardalote	<i>Pardalotus striatus</i>		X	X	X		X			X		X	X			X						
Weebill	<i>Smicrornis brevirostris</i>																X					
Little Friarbird	<i>Philemon citreogularis</i>						X															
Noisy Miner	<i>Manorina melanocephala</i>		X	X	X					X												
Singing Honeyeater	<i>Gavicalis virescens</i>																X					
Brown Honeyeater	<i>Lichmera indistincta</i>			X												X	X					
White-naped Honeyeater	<i>Melithreptus lunatus</i>									X												
Blue-faced Honeyeater	<i>Entomyzon cyanotis</i>									X												
Grey-crowned Babbler	<i>Pomatostomus temporalis</i>				X		X															
Feral Pig	<i>Pachycephala rufiventris</i>			X	X					X						X						
Willie Wagtail	<i>Rhipidura dryas</i>		X	X	X	X	X	X	X	X		X	X	X	X							
Grey Fantail	<i>Rhipidura fuliginosa</i>									X												
Black-faced Cuckoo Shrike	<i>Coracina novaehollandiae</i>									X							X					

Olive-backed Oriole	<i>Oriolus sagittatus</i>				X																	
Pied Butcher Bird	<i>Cracticus nigrogularis</i>		X	X	X	X	X			X					X							
Magpie Lark	<i>Grallina cyanoleuca</i>				X	X									X							
Australian Magpie	<i>Gymnorhina tibicen</i>		X	X	X						X	X	X		X							
Australian Raven	<i>Corvus coronoides</i>		X		X		X		X	X			X									
Apostlebird	<i>Struthidea cinerea</i>		X	X	X	X	X			X		X				X	X					
White-winged Chough	<i>Corcorax melanorhamphos</i>									X												
Mistletoe Bird	<i>Dicaeum hirundinaceum</i>																X					
Zebra Finch	<i>Taeniopygia guttata</i>			X						X				X								
Double-barred Finch	<i>Taeniopygia bichenovii</i>							X		X					X							
Australian Pipit	<i>Anthus novaseelandiae</i>		X			X	X			X				X		X						
Tree Martin	<i>Hirundo nigrocans</i>					X			X				X									
Little Grassbird	<i>Megalurus timoriensis</i>									X				X								
Double-barred Finch	<i>Taeniopygia bichenovii</i>												X									
Black-faced Woodswallow	<i>Artamus cinereus</i>															X						
Brown Goshawk	<i>Accipiter fasciatus</i>													X								
Black-winged Stilt	<i>Himantopus himantopus</i>															X						
Southern Boobook	<i>Ninox novaeseelandiae</i>											X										
Bush Stone-curlew	<i>Burhinus grallarius</i>										X											
Eastern Barn Owl	<i>Tyto javanica</i>												X									

Common Bronzewing	<i>Phaps chalcoptera</i>													X								
MAMMALS																						
House Mouse	<i>Mus musculus</i>	Exotic		X	X																	
Eastern Chestnut Mouse	<i>Pseudomys gacilaudatus</i>										X											
Cat	<i>Felis catus</i>	C2		X	X					X												
Cow	<i>Bos taurus</i>	Exotic	X	X		X				X	X											
Dingo	<i>Canis familiaris dingo</i>	C2								X												
	<i>Rattus</i> sp.			X		X																
European Rabbit	<i>Oryctolagus cuniculus</i>	C2		X	X					X												
Common Planigale	<i>Planigale maculata</i>						X															
Northern Brown Bandicoot	<i>Isoodon macrourus</i>			X																		
Black-striped Wallaby	<i>Macropus dorsalis</i>															X						
Red-necked Wallaby	<i>Macropus rufogriseus</i>			X	X					X						X						
Swamp Wallaby	<i>Wallabia bicolor</i>					X				X												
Wallaroo	<i>Macropus robustus</i>									X						X						
Eastern Grey Kangaroo	<i>Macropus giganteus</i>					X				X												
Feral Pig	<i>Sus scrofa</i>	C2		X		X				X						X						
Echidna	<i>Tachyglossus aculeatus</i>									X												
	<i>Austronomus australis</i>																X					X
Gould's Wattled Bat	<i>Chalinolobus gouldii</i>	C								X			X				X	X	X	*		X
	<i>Chalinolobus morio</i>	C								X			X				*		X	*		X
	<i>Scotorepens</i> spp. or <i>Chalinolobus</i>	C								X*												

	<i>nigrogriseus</i>																				
Little Pied Bat	<i>Chalinolobus picatus</i>	NT							X			*					*	X	X	*	*
	<i>Nyctophilus</i> sp.											X					X				
Western Broad-nosed Bat	<i>Scotorepens balstoni</i>								X*			X						*	*		
	<i>Scotorepens greyii</i>																X	X	X	*	*
Little Broad-nosed Bat	<i>Scotorepens greyii</i> or <i>S. sanborni</i>								X			X									
	<i>Vespadelus baverstocki</i>								X								*		*	*	*
	<i>Vespadelus baverstocki</i> / <i>V. vulturinus</i>											X									
Eastern Cave Bat	<i>Vespadelus troughtoni</i>																*			*	*
	<i>Miniopterus orianae oceanensis</i>								X								X	X	X	X	
Beccari's Free-tail Bat	<i>Mormopterus beccarii</i>											X									
	<i>Mormopterus ridei</i>								X*			X					X	*	X	*	X
Yellow-bellied Sheath-tailed Bat	<i>Saccolaimus flaviventris</i>											X						X	X	X	
	<i>Chaerephon jobensis</i>								X			X							X	*	*
	<i>Taphozous troughtoni</i>											*									
REPTILES																					
Carpentaria Whip Snake	<i>Cryptophis boschmai</i>										X										
Black-headed Python	<i>Aspidites melanocephalus</i>														X						
Keelback	<i>Tropidonophis mairii</i>														X						
	<i>Gekkonidae</i> sp.			X	X					X											
	<i>Lerista fragilis</i>											X									
Robust Striped	<i>Ctenotus robustus</i>						X								X						

Skink																						
Open Litter Rainbow Skink	<i>Carlia pectoralis</i>			X								X	X		X							
Iridescent Litter-skink	<i>Lygisaurus foliorum</i>			X																		
AMPHIBIANS																						
Greenstripe Frog	<i>Cyclorana alboguttata</i>														X	X						
Spotted Grassfrog	<i>Limnodynastes tasmaniensis</i>										X											
Green Tree Frog	<i>Litoria caerulea</i>									X			X									
Broad-palmed Rocket Frog	<i>Litoria latopalmata</i>										X		X									
Ornate Burrowing Frog	<i>Platyplectrum ornatum</i>														X							
Cane Toad	<i>Rhinella marina</i>	Exotic				X				X	X		X		X							
Chubby Gungan	<i>Uperoleia rugosa</i>										X											

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LC = Least Concern
NT = Near Threatened
V = Vulnerable
E = Endangered
Ma = Listed Marine Species (Other Matters Protected) under the Environment Protection and Biodiversity Conservation Act 1999
Mi = Listed Migratory Species (Other Matters Protected) under the Environment Protection and Biodiversity Conservation Act 1999
C1 = Class 1 declared pest under the Land Protection (Pest and Stock Route Management) Act 2002
C2 = Class 2 declared pest under the Land Protection (Pest and Stock Route Management) Act 2002
* = Calls not positively identified



Appendix G Pest Fact Sheets



Cane toads

Bufo marinus



The cane toad is not a declared pest in Queensland, so there is no legal requirement to control them.

Their original introduction in 1935 was to control agricultural pests, but they proved ineffective.

For the past 60 years, cane toads have been expanding their territory in Australia, and are capable of colonising at least four of the mainland Australian states.

As the toad's geographical range continues to expand, concern has increased about their detrimental environmental effects, particularly on the wetlands of the Northern Territory.

Studies into the feasibility of biological control have commenced.

History of introduction and spread

The cane toad or giant toad is an amphibian, native to Central and South America. Cane toads been introduced throughout the world as a biological control for insect pests of agriculture, most notably sugarcane.

A consignment of cane toads from Hawaii was released into Queensland cane fields in 1935. The introduction was surrounded by controversy as to the potential costs and benefits to Australia.

It was hoped that the toad would control Frenchi and greyback beetles—pests of economic importance to the sugarcane industry.

By 1941, however, it had become evident that the cane toad was exerting only limited control over its intended prey. There were two main reasons for this:

- Greyback beetles are only rarely in contact with the ground and Frenchi beetles invade cane fields at a time when the toads are absent due to a lack of protective cover.
- The cane toad has a wide-ranging and indiscriminate diet, and it was not solely dependant upon its intended prey.

The unlimited food source, suitable environment and low rates of predation allowed dynamic reproduction and spread. Toads were recorded in Brisbane only 10 years after release. The toad continues to thrive and has now invaded the Northern Territory and New South Wales (see Figure 1).

Figure 1 Current distribution of the cane toad



The cane toad's advance is only limited by environmental factors, such as the availability of water for breeding, tolerable temperatures, suitable shelter and an abundance of food.

Toads at the frontier of their range of expansion may be larger than those in established populations. This is most probably due to greater food supply, combined with a lower incidence of disease.

Description and general information

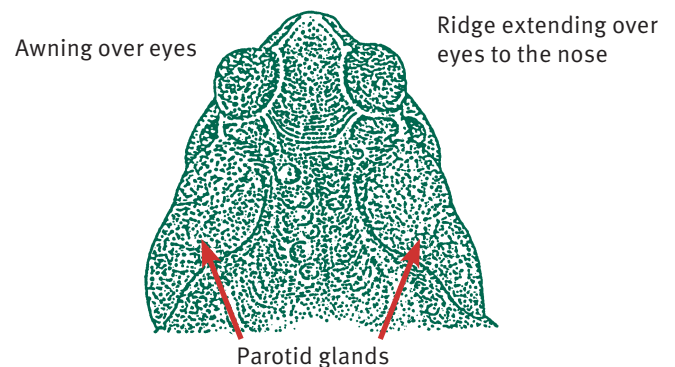
In comparison with native frog and toad species, adult cane toads have a distinctive head and face, and are large and heavily built creatures (adults may grow to 20 cm).

Following their aquatic larval stages (eggs and tadpoles), cane toads are generally encountered at night near any source of light. Cane toads are ground-dwelling—they are poor climbers and unable to jump very high.

A definite visor or awning extends over each eye and a high angular bony ridge extends from the eyes to the nose.

The parotid glands (see Figure 2) are perhaps the most characteristic feature of the adult cane toad. These glands are large, protuberant, and are situated on the head behind each ear. These glands carry a toxin.

Figure 2 Distinguishing features of the cane toad



The cane toad's hands and feet are relatively small and lack discs at the tips of the digits. Webbing is absent between the fingers but is distinct and leathery between the toes.

Colouring on the dorsal (upper) surface may be brown, olive-brown or reddish-brown. The ventral (under) surface varies from white to yellow and is usually mottled with brown.

Warts are present on all cane toads; however, males possess more than females. Warts are dark brown at the caps.

Mating

Mating can occur at any time of the year and depends only on available food and permanent water. The mating call is a continuous purring trill that sounds like a running motor.

In situations where females are scarce or absent, male cane toads may have the ability to undergo a sex change to become fertile females; however, this has not been proved.

Eggs

Both cane toads and native frogs spawn in slow-moving or still water, but their eggs can be easily distinguished.

Cane toad eggs are laid in long, gelatinous ‘strings’ with the developing tadpoles appearing as a row of small black dots along the length. The strings are unique to cane toads, with native frogs eggs laid in clusters, generally appearing as blobs of jelly attached to water plants or debris. Native frogs generally produce egg clusters as mounds of foam floating on the water surface.

Compared with native species, cane toad egg production is dynamic and a single clutch can contain up to 35 000 eggs. Remove any cane toad eggs found in the water and allow to dry out.

Figure 3 Drawing of toad spawn from *Wildlife of greater Brisbane*



Tadpoles

The cane toad is the only species in Australia that has a pure black tadpole. Native frogs have lighter-coloured undersides with a great range of colours and markings—cane toad tadpoles may turn paler colours to almost transparent at night.

Cane toad tadpoles are small and usually congregate in vast, slow-moving shoals. This ‘shoaling’ behaviour is uncharacteristic of most native species.

Unlike cane toad tadpoles, native species develop lungs at an early stage and periodically rise to the surface in order to exchange their lung gasses. Large groupings of tadpoles that do not break the water surface for air indicate cane toads.

Young toads

Following emergence from the water, the young toadlets usually congregate around the moist perimeter of the water body for about a week before they eventually disperse.

Young toads are very difficult to distinguish from the native *Uperoleia* species, which also have parotid glands, but all *Uperoleia* species have bright red patches in the groin area.

Under ideal conditions toadlets may reach adult size within a year.

Toxicity

Bufo marinus produce venom in glands occurring in most of the skin on their upper surface. The venom is concentrated in the parotid glands as a creamy-white solution, which is released when the animal experiences extreme provocation or direct localised pressure (e.g. grasped by the mouth of a predator).

The parotid solution is highly toxic and when ingested it produces drastic acceleration of the heartbeat, shortness of breath, salivation and prostration. It is extremely painful if accidentally rubbed into the eye.

Ingestion of toads by domestic and most native animals can result in death. In some recorded cases, death has occurred within 15 minutes.

Field observations suggest that some predatory Australian species have learned how to feed safely on cane toads.

Birds have been observed flipping toads over to avoid the parotid glands. Predatory reptiles may have more trouble adapting, being unable to remove a toad from the mouth once they start feeding.

Effects on wildlife

The cane toad is poisonous at all stages of its life cycle and most native frog larvae and many aquatic invertebrates are dramatically affected by their presence.

Cane toads are voracious feeders that consume a wide variety of insects, frogs, small reptiles, mammals and even birds. Perhaps the only limiting factor to the prey taken is the width of the cane toad’s mouth.

It has been suggested that cane toad competition for food and breeding grounds has been responsible for reducing the populations of some native frogs. However, many native frogs are arboreal (tree-dwelling) and occupy different niches. Cane toads don’t have the native frogs’ ability to ‘shut down’ during dry seasons when resources are limited.

Pressure from cane toads may displace native animals (frogs and other species) where they already suffer due to manipulation of their habitat by humans and grazing animals. Animals that use waterholes as retreat sites during the dry season are especially vulnerable—toads will congregate here in large numbers.

Public health

Cane toads readily eat animal and human faecal material and, in areas of poor hygiene, they have been known to transmit disease such as salmonella.

Control

Control of cane toads is not enforced as there is currently no available effective broad scale control. Individuals and community groups have carried out removal campaigns to decrease numbers and slow the invasion front.

Fencing is recommended to keep toads out of ponds intended for native fish and frogs; a height of 50 cm is sufficient. Bird wire with 1 cm holes may keep toads out of an area.

Research indicates that spread can be delayed in semi-arid areas by blocking access to water holes.

Individual toads may be killed relatively humanely using a commercial spray available from hardware stores or may be stunned and decapitated (only by experienced operators). The removal of eggs from small water bodies such as frog ponds can be effective

Researchers have successfully mitigated impacts in recently colonised areas by 'training' predators however, large scale application of this technique is difficult.

Injured or 'lost' frogs

Brisbane Forest Park 07 3300 4855

Wildlife Preservation
Society of Queensland 07 3221 0194

Queensland Museum 07 3840 7555

WILVO's Wildlife Volunteer's Organistaion (check your local phone directory to see if a group operates in your area).

Further information

Further information is available from your local government office, or by contacting Biosecurity Queensland (call 13 25 23 or visit our website at www.biosecurity.qld.gov.au).



This fact sheet is developed with funding support from the Land Protection Fund.

Fact sheets are available from Department of Agriculture, Fisheries and Forestry (DAFF) service centres and our Customer Service Centre (telephone 13 25 23). Check our website at www.biosecurity.qld.gov.au to ensure you have the latest version of this fact sheet. The control methods referred to in this fact sheet should be used in accordance with the restrictions (federal and state legislation, and local government laws) directly or indirectly related to each control method. These restrictions may prevent the use of one or more of the methods referred to, depending on individual circumstances. While every care is taken to ensure the accuracy of this information, DAFF does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.

Feral pigs in Queensland

Distribution, ecology and impact



Domestic pigs (*Sus scrofa*) were introduced to Australia by early settlers. Subsequent accidental and deliberate releases resulted in the wild (feral) population establishing throughout Australia.

Feral pigs damage crops, stock and property, spread weeds and transmit diseases such as leptospirosis and foot-and-mouth. They also cause environmental damage, digging up large areas of native vegetation and spreading weeds.

Declaration details

Feral pigs are declared Class 2 pests under the *Land Protection (Pest and Stock Route Management) Act 2002*. Declaration requires landholders to control declared pests on land under their control. A local government may serve a notice upon a landholder requiring control of declared pests.

For information on feral pig control, see Biosecurity Queensland's fact sheet *Control of feral pigs* (www.biosecurity.qld.gov.au).

Description and general information

Australian feral pigs have more in common with their Eurasian cousins than with domestic pigs. They are smaller, leaner and more muscular than domestic pigs, with well-developed shoulders and necks and smaller, shorter hindquarters. Their hair is sparse and longer and coarser than domestic pigs. Feral pigs also have longer, larger snouts and tusks, straight tails, smaller mostly pricked ears and much narrower backs.

Colouring is predominantly black, buff-coloured or spotted black and white. Some are agouti-patterned (dark hair with a lighter tip). Juveniles may be striped. Colours vary between and within areas.

Growth potential is similar to domestic pigs, although harsh environmental conditions tend to stunt development. Adult female feral pigs usually weigh 50–60 kg, while males usually weigh 80–100 kg. Exceptional animals have reached 260 kg.

Older boars (razorbacks) have massive heads and shoulders and a raised and prominent back bone that slopes steeply down to small hams and short hind legs. A keratinous plaque or shield up to three centimetres thick usually develops on their shoulders and flanks.



Queensland Government

This provides some protection from serious injury during fights with other boars. Some boars develop a crest or mane of stiff bristles extending from their neck down the middle of their back, which stands straight on end when the animal is enraged.

Habitat and distribution

Feral pigs inhabit about 40% of Australia from subalpine grasslands to monsoonal floodplains and are found in all habitat types in Queensland (see Figure 1).

Estimations of feral pig numbers in Australia range up to 24 million. The greatest concentrations of feral pigs are on the larger drainage basins and swamp areas of the coast and inland.

Biology and behaviour

Feral pigs are capable of migrating considerable distances, but tend to stay within home ranges. Watering points are the focus of activity, particularly during hot weather. Pigs have few sweat glands, so high temperatures require them to drink more often and wallow in water or mud to cool off. Dense cover is the preferred habitat, providing protection from the sun and their main predator—humans.

Female and juvenile pigs usually live in small family groups with a home range of 2–20 km². Adult males are typically solitary, with a home range of 8–50 km². Range size varies with season, habitat, food availability and disturbance. Herds of 400 pigs have been recorded in Cape York.

Most pigs remain in their home ranges, even when subject to some disturbance such as infrequent hunting by people and dogs. Regular disturbance will drive them on.

Feral pigs are generally nocturnal, spending daylight hours sheltering in dense cover. They are shy animals and will avoid humans, making it easy to miss their presence or to drastically underestimate their numbers.

Pigs are omnivorous, eating plants and animals. They are extremely opportunistic feeders, exploiting any temporarily abundant food. They prefer green feed and will eat grains, sugarcane and other crops, fruit and vegetables. They root extensively for tubers, worms and soil invertebrates. Small animals are preyed upon. Stock losses occur primarily with lambs but occasionally with newborn calves. Carrion (dead and rotting flesh) is also consumed.

Feral pigs have relatively high energy and protein requirements, particularly during pregnancy and lactation. These requirements are not available all year in all areas, so pigs often have to move to other parts of their home range during pregnancy.

This seasonal need for either more food, or high-energy or protein-rich food, is often the reason for their impact on agricultural crops. It is also the weakness in their ecology that can be exploited for management purposes.

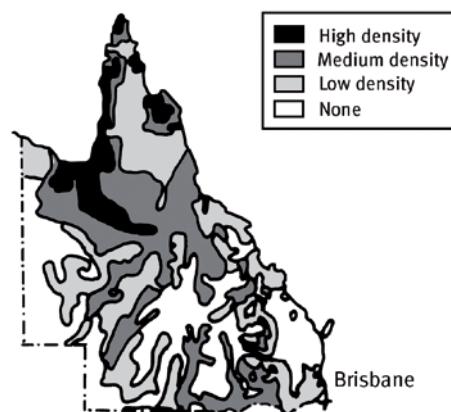


Figure 1. Distribution of feral pigs in Queensland

Life cycle

The reproductive potential of feral pigs is more similar to rabbits than other large mammals in Australia. In good conditions, feral pig populations may increase fivefold in a 12-month period.

Under favourable conditions, breeding occurs all year. Adult females have a 21-day oestrus cycle, with a gestation period of about 113 days, producing a litter of 4–10 piglets, depending on the sow's age, weight and food supply.

Sows can make nests of available vegetation just before farrowing. Nests can be 3 m long by 1.5 m wide and up to 1 m high, with a domed roof. Nests are usually less than 2 km from available water. Piglets normally spend the first 1–5 days of life inside the nest, with the sow inside or close by.

The next fertile mating can occur after 2–3 months of farrowing, allowing sows to produce two litters per year if good seasonal conditions prevail.

Weaning occurs after 2–3 months. Sexual maturity is reached when sows weigh about 25 kg, usually around six months of age.

Mortality of juveniles is high if the mother's dietary protein intake is low (up to 100% mortality in dry seasons). Adult mortality does not vary as much with seasonal conditions, but few animals live more than five years.

Estimating populations

Sightings are the least reliable guide to feral pig presence. Careful observation of the signs of pig activity will allow an experienced observer to estimate population densities. Inexperienced observers, however, may see nothing.

The following is a list of common pig signs that may be used to establish relative numbers and sizes:

- fresh digging or rooting of ground (causing a ploughed appearance). This indicates recent pig activity, but the area affected gives little indication of numbers as large areas can be dug by a small number of pigs
- tracks and faeces on and off pads. Faeces size, shape and consistency vary with age and diet, but is typically 3–6 cm wide, 7–22 cm long and well formed. Close inspection can help determine diet (e.g. plant matter and seeds, egg shell and bone fragments, wool and marsupial hair)
- mud or hair at holes in fences where pigs have pushed through
- wallows. Pigs leave distinctive oval depressions in mud
- tusk marking and mud rubs on trees and fence posts. These give an indication of pig size
- nests in vegetation made by sows before farrowing. Be sure to approach these with caution.

Spotlighting, aerial survey, and use of dogs can be used for actual pig counts.

Human and environmental impacts

Feral pigs wide habitat range, omnivorous diet and potential for rapid population growth in good seasons mean that few agricultural pursuits are unaffected by these pest animals. Damage is estimated at \$100 million annually.

Economic impact is of three types:

1. value of the direct losses to agricultural production
2. value of the continuing expenditure on pig control
3. value of lost opportunities (i.e. control expenditure reduces opportunity to profit from alternative investments).

Examples of direct agricultural losses are listed below.

Crops

Pigs can damage almost all crops from sowing to harvest, starting with uprooting seed and seedlings to feeding on or trampling mature crop.

They feed on seed and grain crops (except safflower), fruit (especially banana, mango, papaw, macadamia and lychee) and vegetable crops.

Most damage to sugarcane occurs during the dry season. Older cane with a high sugar content is preferred. Because sufficient moisture can be obtained from the cane, pigs can 'camp' in a paddock for several weeks (causing substantial damage).

Livestock

Predation on livestock is basically limited to lambs. Research has shown feral pigs can take up to 40% of lambs. This not only reduces income from the sale of lambs, but also reduces the opportunity for herd improvement by limiting selection for optimum wool traits.

Pasture

Pastures are damaged by grazing and rooting. Pigs can also transport weeds; their diggings provide ideal conditions for weed establishment.

Fences and watering points

Wallowing pigs damage and foul the water in tanks and bore drains and silt up troughs. Rooting can weaken dam walls. Being large, powerful animals, pigs can breach fences, providing passage for other pest animals.

Environmental concerns

Pig activity has a dramatic effect on creeks and lakes. In many areas concentrated rooting 'ploughs' up to 20 m around the waterline.

Such disturbance of the soil and natural vegetation degrades water quality and the habitat for small terrestrial and aquatic animals. It also creates erosion and allows exotic weeds to establish.

Predation of native fauna does occur and examination of faeces has shown remains of marsupials, reptiles, insects, and ground-nesting birds and their eggs.

Diseases and parasites

Feral pigs can carry many infectious diseases and internal and external parasites. Some are endemic (already present), while others are still exotic to Australia.

Many of the diseases can spread to domestic pigs, other livestock and humans. Diseases naturally transmitted from animal to man are called 'zoonoses'.

Zoonoses currently in Australian feral pigs

- **sparganosis** – a parasite that can infest the muscles of humans, forming encyst lumps. Common in pigs from swampy areas. Contracted by ingesting raw meat
- **meliodosis** – a serious bacterial disease that causes abscesses
- **leptospirosis** – a serious bacterial disease; in humans called Weil's disease, causing very high temperatures, kidney trouble and jaundice; can be fatal. It is found in up to 20% of feral pigs in Queensland
- **Q fever** – occurs in all animals and is well known by meat workers. It can cause very high temperature and result in heart problems; can be fatal
- **tuberculosis (TB)** – a serious disease of the lungs. Once common but now rare, it is contracted by eating inadequately cooked flesh of infected animals

- **brucellosis (porcine and bovine)** – a bacterial disease causing severe long-term illness, undulant fever and possible infertility, both strains are contracted by handling raw meat. Porcine brucellosis is rare in Queensland.

Feral pigs were blamed for the spread of TB and bovine brucellosis among cattle but both diseases have been eradicated from Queensland without directly targeting feral pigs.

Leptospirosis and Q fever infection can occur through contact with blood, meat and urine through broken skin, intake of urine-contaminated food or water, and inhalation of infectious airborne organisms.

Brucellosis, leptospirosis and Q fever cause flu-like symptoms similar to Ross River fever. Leptospirosis and Q fever can be fatal.

To prevent contracting these diseases it is advisable to avoid handling feral pigs. Slaughtering and butchering should be undertaken only at licensed premises where there is a full-time meat inspector on duty to ensure that animals are free of the above diseases.

If you must handle feral pig meat, use suitable protective clothing (mask, goggles, strong rubber gloves and plastic apron and boots) to minimise contamination with blood, urine and faeces.

Rare or undercooked meat should not be eaten; thoroughly cook meat to avoid contracting pathogens.

Exotic livestock diseases

A major concern with feral pigs is their potential to harbour or spread exotic livestock diseases. The cost to the Australian community if foot-and-mouth disease were introduced to Australia is estimated at \$3 billion in lost export trade, even if the outbreak were eradicated immediately.

This would result in major social upheaval in rural Australia.

Other exotic diseases of concern:

- **swine vesicular disease** – viral disease affecting only pigs
- **Aujeszky's disease** – highly contagious herpes viral disease affecting several animal species, killing up to 100% of affected piglets
- **African swine fever** – highly contagious viral disease affecting only pigs; mortality rate is high
- **classical swine fever (CSF)** – also called hog cholera. This highly contagious viral disease of pigs kills up to 90% of infected animals in its acute form.

For more information on animal diseases contact your local Biosecurity Queensland veterinarian.

Exotic zoonotic diseases and parasites

- **Japanese encephalitis** – a virus spread from pigs to humans by mosquitoes, causing acute severe problems of the nervous system (pain, sleepiness and coma)
- **rabies** – a serious disease affecting the brain; can be fatal
- **screw-worm fly** – maggots from this fly can attack healthy flesh; if untreated can cause massive wounds to animals and humans
- **trichinosis** – a helminth (roundworm). All mammals are susceptible, with humans infected by eating improperly cooked meat.

North Queensland's popularity as a tourist destination is increasing. Many international visitors have travelled through countries infected with exotic diseases before entering Australia. Feral pigs are known to frequent rubbish tips around tourist lodges and scavenge human waste.

There is a real danger that an exotic disease could enter Australia via this contact and remain undetected for some time. Such a time lapse could allow the disease to become widespread, making eradication difficult or even impossible.

Further information

Further information is available from your local government office, or by contacting Biosecurity Queensland (call 13 25 23 or visit our website at www.biosecurity.qld.gov.au).

Fact sheets are available from Department of Employment, Economic Development and Innovation (DEEDI) service centres and our Business Information Centre (telephone 13 25 23). Check our website at www.biosecurity.qld.gov.au to ensure you have the latest version of this fact sheet. The control methods referred to in this fact sheet should be used in accordance with the restrictions (federal and state legislation, and local government laws) directly or indirectly related to each control method. These restrictions may prevent the use of one or more of the methods referred to, depending on individual circumstances. While every care is taken to ensure the accuracy of this information, DEEDI does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.

Control of feral pigs



In Queensland, feral pigs (*sus scrofa*) are declared Class 2 animals under the *Land Protection (Pest and Stock Route Management) Act 2002* and their control is the responsibility of every landholder.

Feral pigs are difficult to control for a number of reasons.

- They are nocturnal animals, camping through the day in mainly inaccessible vegetation where vehicle access is often impossible.
- Pigs have a relatively short gestation period and produce a large number of offspring, so repeated control programs must be conducted before any sustained population reduction is achieved.
- They are omnivores: a species that eats both plants and animals as their primary food source, which makes successful pre-feeding difficult.
- Their home ranges are large—between 2 and 50 km²; thus, control programs need to be conducted over a wide area (often including several properties) to be effective.

For more information on feral pig distribution, ecology and impact see the fact sheet *Feral pigs in Queensland*.

How to develop a pig control strategy

The strategic management of feral pigs is aimed at minimising the damage they cause to primary production and conservation areas.

Strategic management involves four key components:

Defining the problem—first, you need to define the true impact of feral pigs on the valued resource. This sets a justifiable cost of control.

Management plan—next, it is important to determine the best combination of control methods for your control program. Often the most effective approach is to coordinate on a local and regional level.

Implementation—actions often involve the cooperation with neighbouring land managers, both private and public.

Monitoring and evaluation—monitoring determines the cost-effectiveness of each control method and the overall efficiency of the strategy. Evaluation establishes if and how management should be changed.



Trapping

Trapping is an important technique that is most useful in populated areas, on smaller properties (<5000 ha), and where there are low pig numbers. Trapping can be useful in 'mopping up' survivors from poisoning programs. It is most successful when food resources are limited.

Trigger mechanisms for pig traps can be made pig-specific and therefore pose little danger to other wild or domestic animals.

Advantages

- This is the safest form of control and can be safely undertaken on closely populated areas.
- Flexible and can be incorporated into routine property activities, making economical use of labour and materials.
- Carcasses can be safely disposed of.
- Traps can be moved and re-used; good trapping makes use of opportunities as they arise.
- Cost of traps can be offset by selling trapped pigs.
- Normal pig behaviour is not altered, which allows a greater number of the total population in an area to be removed.
- More humane to pigs and non-target species.

Disadvantages

- Can be time consuming and expensive to construct and maintain.
- Must be checked regularly.
- Not practical for large-scale control.
- Some pigs are trap shy.

Tips

- Stop all activities that will disturb normal feeding (i.e. do not undertake any shooting or dogging).
- Free feeding prior to activating traps is an essential part of successful trapping.
- Feeding sites should be placed where feral pigs are active (i.e. water points, holes in fences, areas containing old carcasses on which pigs have been feeding).
- Bait for traps must be food that pigs usually eat in that area. Pigs feeding on one crop (e.g. sugarcane) will often not take to alternative foods. However, new baits are sometimes attractive (e.g. fermented grains).
- The trap can be built around the feeding site, with feeding within the trap undertaken for several nights before it is set.
- Set the trap every night and check each day. If the trap cannot be checked daily then shade and water must be provided.

- Continue to trap until no more pigs are caught. A change of bait can be tried. Again, feed for one or two nights before re-setting the trap.
- Traps may be left permanently in locations used by pigs and can be pre-baited and activated when fresh signs of pigs appear.
- If the trap is to be moved, start feeding at the new site before re-locating the trap.

Design

There are several trap designs but all are principally an enclosed area with one-way gates (see Figure 1).

The main area of the trap can be any shape and be made from materials on the property. The best material is steel mesh with a grid 100 × 100 mm, with a minimum height of at least 1.5 m. Star pickets need to be placed no more than 1.5 m apart and imbedded far enough to ensure that adult pigs cannot push them over or lift them up out of the ground.

Alternative trap entrances

Funnel entrance

Formed by the two ends of the mesh forming a funnel, the ends are tied together at the top with wire or rope. The pig moves through the funnel forcing the bottom of the mesh ends apart and once it is in the trap the ends spring back together (see Figure 2).

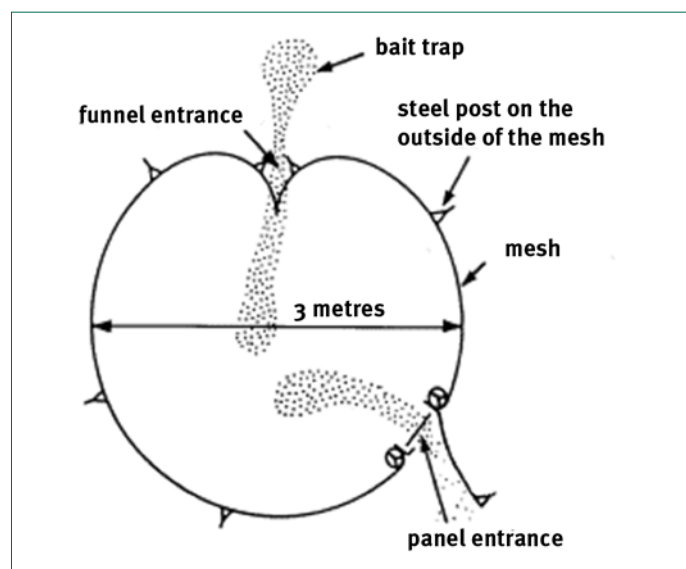


Figure 1. Alternative entrances

Tripped gate entrance

A side-hinged gate is pulled shut by springs and is held open by many systems that can be triggered to allow the gate to swing shut. Often trip wires are used, but many other systems have been tried. Most of these systems are not selective for feral pigs and can be triggered by any animal attracted to the bait. Once triggered the trap is no longer effective in trapping pigs.

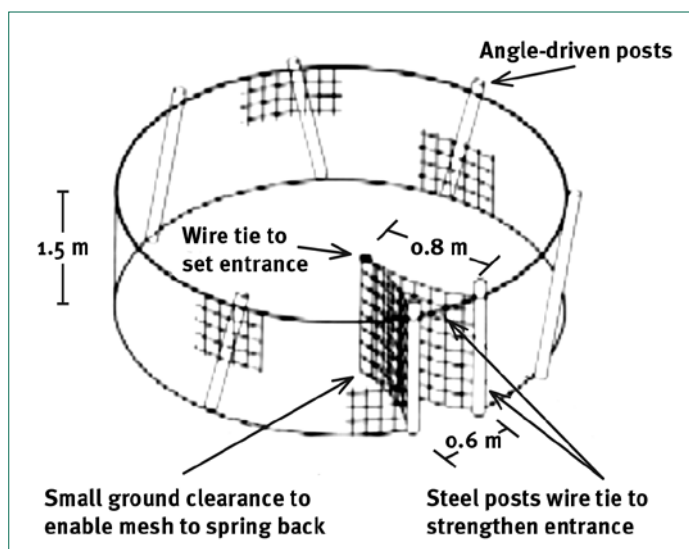


Figure 2. Silo trap with funnel entrance (14 m of silo mesh diameter about 4.5 m)

Pig-specific trigger

By far the simplest and most effective trigger system has the gate held open by a bar (often a branch or piece of wood) which is hooked over the wire on the gate and on the side panel (see Figure 3).

Pigs rooting for feed in the trap lift the bar allowing the gate to swing shut. The specific feeding habit of pigs insures they are the only animals that lift the trigger bar.

The gate may be latched to prevent pigs from opening the door once triggered. However, this will prevent more pigs pushing their way in to join those inside.

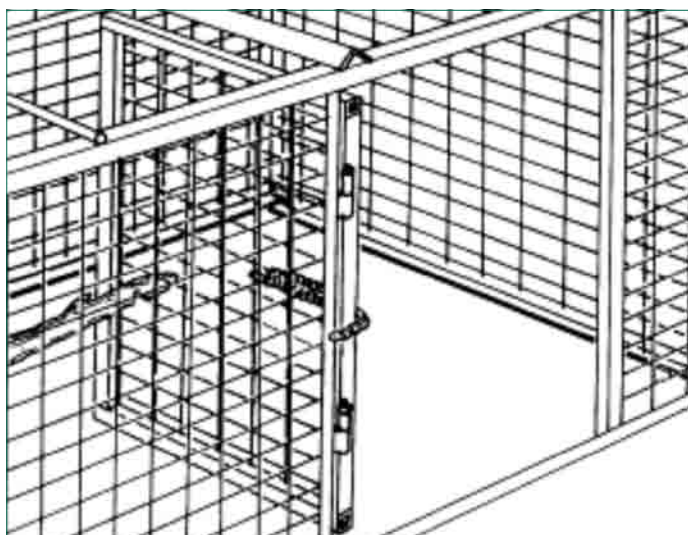


Figure 3a. Pig-specific trigger

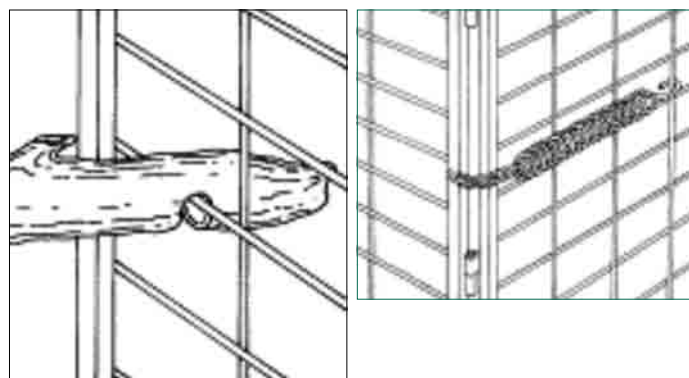


Figure 3b. Close up of pig-specific trigger

Poisoning

Poisoning is the most effective control method available that can quickly reduce a pig population.

Sodium fluoroacetate (1080) is recommended, but can only be supplied through persons authorised under the Health Act. Your local land protection officer or your local government office should be able to assist you.

Phosphorus-based poisons are available, but are not recommended as they are inhumane, less effective than 1080, and can result in poisoning of non-target species.

Pre-feeding is the most important step in poisoning operations. Free feeding with non-poisoned bait should be performed for several days prior to laying poisoned baits.

By selecting bait wisely, landholders can be species-selective in their poisoning program and avoid many of the unintentional effects of secondary poisoning.

Bait material such as fermented grains are very attractive to pigs but not to other animals, while it is a good idea to establish a free feeding routine so that pigs are the only animals feeding—they keep other non-targets away from the feeding site. Note that feral pigs are one of the few animals that will dig up bait.

Shooting and the use of dogs

Shooting pigs by helicopter is effective in inaccessible areas where pigs exist in reasonable numbers and are observable from the air.

The weapons recommended are shotguns with 'buckshot' (SG) cartridges and high-powered .308 rifles with a bullet weight in excess of 150 grains, preferably hollow point or soft point projectiles.

Ground shooting is not effective in reducing the pig population unless intense shooting is undertaken on a small, isolated and accessible population of pigs.

Dogs may be used to remove the few remaining pigs left after poisoning and trapping campaigns. Dogs are able to locate and flush pigs out of areas of thick cover.

Do not use dogs or shoot in areas before or during poisoning or trapping operations.

Fencing

Though an expensive option, fencing can offer successful pig control. Research has indicated that the most successful pig-proof fences are also the most expensive.

The most effective pig-proof fences use fabricated sheep mesh held close to the ground by plain or barbed wire and supported on steel posts.

Electrifying a conventional fence greatly improves its effectiveness if used before pigs have established a path through the fence.

Pigs will often charge an electric fence and unless the fence incorporates fabricated netting they often successfully breach the fence.

For crop protection or to avoid lamb predation, pig-proof fences need to be constructed *before* the pigs become a problem. Once pigs have adjusted to feeding on grain or lambs in a particular paddock fencing may be ineffective.

Diseases and parasites carried by pigs

Feral pigs are known to carry many diseases that can infect other livestock and be transmitted to humans.

Diseases most likely to affect people are:

- sparganosis—a parasite that can infest the muscles
- leptospirosis—a serious illness which causes very high temperatures, kidney problems and jaundice
- Q fever—a disease that can cause very high temperature and result in severe heart problems.

Q fever and leptospirosis have symptoms similar to Ross River fever, and can be contracted from contact with blood, meat and urine through broken skin, intake of urine-contaminated food or water, and inhalation of infectious air-borne organisms. Both can be fatal.

It is advisable to avoid handling feral pigs unless they are slaughtered at licensed premises where there is a full-time meat inspector on duty to ensure that animals are free of the above diseases.

Further information

Further information is available from your local government office, or by contacting Biosecurity Queensland (call 13 25 23 or visit our website at www.biosecurity.qld.gov.au).

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Dingoes

Canis familiaris dingo



The dingo (*Canis familiaris dingo*) is a primitive canid related to wolves and coyote. The dingo was not a part of the ancestral fauna of Australia. Though its origins are not clear, it is thought to have arrived in Australia 3500–4000 years ago.

It is the largest mammalian carnivore remaining in mainland Australia, and as such fills an important ecological niche. Females weigh about 12 kg and males 15 kg.

The dingo has been regarded as a serious predator of domestic stock since early European settlement in Australia. Early research emphasis was on control, indeed eradication of the dingo. No attempt was made to study the animal, measure predation, or to understand why the problem existed.

Declaration details

Under the *Land Protection (Pest and Stock Route Management) Act 2002* the dingo/wild dog is a declared Class 2 pest animal. It is the responsibility of landholders to reduce the number of dingoes/wild dogs on their property.



Description and general information

Red, ginger and sandy-yellow are the dominant coat colours, though dingoes can also be pure white, black and tan or solid black.

It is not difficult to distinguish between most dingoes and hybrids. The presence of domestic genes is suggested by broken colours—brindling and patchiness in the normally pure white feet and chest patch and sable colouration (black hairs along the back and sides).

Dingoes have a more heavily boned skull and larger teeth (especially the canine) than domestic dogs of similar size.

Distribution

Dingo numbers are believed to be higher today than in pre-European times. This is thought to be due to increased food availability via the introduced rabbit and cattle carcasses, and the development of permanent waters in arid areas of the state.

Dingoes/wild dogs are now present in all parts of the state.

The distribution of the wild dog in relation to purebred dingoes varies throughout the state. In far western areas, most dingoes sighted appear to be 'pure', with characteristic white points and broad heads. Closer to settled areas a greater number of feral domestic dogs produce a generally hybrid population. It has been estimated that dingoes are 50% pure in south-eastern Queensland and 90–95% pure in south-western and central Queensland.



Reproduction

Dingoes have only one breeding season per year (usually April to June), whereas domestic bitches have two or more oestrus cycles per year. However, unless seasons are particularly favourable, or human sources of food are intentionally or inadvertently provided, feral domestic dogs are unlikely to successfully rear two litters per year.

After a nine-week gestation, dingo pups (usually four to six) are born in a hollow log or cave den. Bitches tend to use the same den each year. Pups are suckled at four to six weeks and generally weaned at four months. When large enough to travel, pups are taken from the den to kills, and other dens may be used. The range of pups is increased as they are moved from den to den. In this way the pups are gradually moved around the bitch's home range.

Independence may occur as early as six months of age when parents abandon them, but this results in high juvenile mortality. Pups that become independent around 12 months appear to disperse voluntarily. Being larger and more experienced, mortality is then usually low.

Where dingoes live alone or in small groups (most pastoral and semi-settled areas), mature females will breed successfully each year.

By contrast, dominant female infanticide results in only one litter being successfully raised each year within groups containing several adult females (e.g. undisturbed areas such as the Simpson Desert). The dominant (alpha) female will kill all pups of the other females, and then use subordinate females to suckle and rear her litter.

Home range

Radio tracking studies show dingoes occupy a discrete area known as a 'home range'. The dingo visits the edge of this area frequently.

The home range can vary in size according to the productivity of the country—from 9 km² in rainforest areas to 300 km² on the Nullarbor Plain.

The edge of the home range is commonly associated with a major topographic feature (e.g. an escarpment, a major ridge or stream).

The home range is not used uniformly. Activity is centred on areas with highest food density.

Hunting movement is slow and exploratory, in contrast to frequent rapid movement around the home range boundary.

Pads follow well defined paths and are most likely associated with sociality and home range boundary maintenance. Activity is highest at dusk and dawn.

Social organisation

Dingoes in an undisturbed area generally belong to discrete packs (3–12 members), which occupy long-term, non-overlapping territories. The group rarely moves as a pack—rather, members meet and separate again throughout the day. Dingoes are most gregarious during the breeding season.

There is overlap of home ranges within a group. In contrast, boundaries between groups are more rigid, actively defended and infrequently crossed.

Olfactory communication (smell) is important in dingo social organisation. Dingo droppings are deposited along pads in specific areas where other dingoes will encounter them (creek crossings, intersections of roads and fences).

These ‘scent posts’ appear to delineate the home range boundary and act as a warning to neighbouring groups and individuals.

This strong site attachment of dingoes is contrary to the notion commonly held by property owners that dingoes will travel large distances to kill stock.

Diet

Dietary research of stomach content and faecal scats has shown dingoes are opportunistic predators.

Medium-size animals such as kangaroos, wallabies, rabbits and possums consistently form the major part of the dingo diet.

Studies by the Western Australia Agriculture Protection Board show dingoes in undisturbed refuge areas killed and ate kangaroos strictly according to need.

On grazing country, however, ‘dingoes harassed, bit or killed sheep in large numbers, often without eating any’. The consumption of these sheep carcasses was the exception rather than the rule. Even kangaroos in these areas were sometimes killed in ‘play’ type behaviour rather than for food.

Such dietary studies could suggest dingo predation of domestic stock is low. There is, however, a need for caution in using such studies to assess dingo impact on stock.



Grouping increases foraging efficiency and appears necessary to exploit larger prey. Dingoes cooperating in groups are more successful in hunting kangaroos than lone dingoes are. While lone dingoes can easily kill sheep, it is less likely a solitary dingo would successfully attack a calf in the presence of a defending cow.

Disease threat

Dingoes are vectors of canid diseases (e.g. distemper, parvovirus) and parasites. The hydatid parasite *Echinococcus granulosus* is a major problem of dogs and domestic stock. It can cause illness and occasionally death in humans.

The dingo could pose a serious risk if the exotic disease rabies was introduced to Australia.

Beneficial considerations

The establishment of watering points during post-European settlement has resulted in a huge increase in the kangaroo population, with consequent strong pasture competition with domestic livestock.

Though it is widely accepted that sheep production is near impossible in the presence of dingoes, many cattle producers will tolerate dingoes because of their believed suppression of kangaroo numbers.

Research has shown that not only does the dingo have the potential to mitigate population growth of native species during abundant seasons, it could also be an important limiting factor for many feral animal populations (e.g. feral pigs and goats).



Destruction of the dingo could cause increases in other pests to the grazing industry and result in widespread degradation of environmentally sensitive areas. However, this has not been proven.

Further information

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Fact sheets are available from Department of Employment, Economic Development and Innovation (DEEDI) service centres and our Business Information Centre (telephone 13 25 23). Check our website at www.biosecurity.qld.gov.au to ensure you have the latest version of this fact sheet. The control methods referred to in this fact sheet should be used in accordance with the restrictions (federal and state legislation, and local government laws) directly or indirectly related to each control method. These restrictions may prevent the use of one or more of the methods referred to, depending on individual circumstances. While every care is taken to ensure the accuracy of this information, DEEDI does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.

Wild dogs

Canis familiaris



The term wild dog refers collectively to purebred dingoes, dingo hybrids and domestic dogs that have escaped or been deliberately released.

Early management strategies focused on eradication of wild dogs. The effectiveness of control campaigns was usually based on circumstantial evidence.

The development of radio-tracking technology provided the opportunity to study wild dog movement and allowed better assessment of the effectiveness of control operations.

Wild dog control methods include trapping, shooting, fencing, poisoning and the use of guard dogs to protect valuable stock. A planned strategy using a combination of these methods that also considers wild dog behaviour will enable effective management of the population.

Declaration details

Wild dogs are declared animals under the *Land Protection (Pest and Stock Route Management) Act 2002*. As such, all land owners in Queensland are required to reduce the number of wild dogs on their properties.

Control

Shooting

Shooting is an opportunistic method, mostly used for control of small populations or individual problem animals.

Trapping

Trapping is time-consuming and labour-intensive. The success of trapping (using leg hold traps and snares) depends on the skill of the operator. Trapping is predominantly used in areas with low populations and to control 'problem' wild dogs.

Trapping by inexperienced operators may prove detrimental if a wild dog is exposed to a carelessly prepared and presented trap, and subsequently escapes. Such animals may become 'trap shy', or maimed to such a degree that they can prey only on more easily caught domestic stock.

For humane reasons and to prevent escape, poisoning traps with strychnine is recommended to quickly kill captured animals.

A mixture of dog faeces and urine is a popular lure used by trappers. Attractiveness of lures varies with seasons and locations. No single lure has yet been found that is consistently attractive to wild dogs.

Traps are best placed on the wild dog boundary pad. Here the wild dog is most likely to find and investigate the decoy/odour.

Wild dog scent posts can be found by walking with a domestic dog on a lead along a known pad. Trap placement in relation to the scent post can be optimised by observing the dog's behaviour as it approaches. Factors to consider are:

- where on the bush it smells
- placement of feet while urinating/defecating
- how it approaches and where it scratches in relation to the pad and scent post.

Traps are not target-specific and should therefore be set in situations that are less likely to catch other animals. Avoid setting traps close to waterholes.

Padded jaw traps are recommended—these are more humane than steel leg-hold traps.



Queensland Government

Fencing

Fencing suitable to exclude wild dogs is expensive to build and requires continual maintenance to repair damage caused by fallen timber, floods and animals. However, a properly maintained fence can restrict movement back into an area where wild dogs have been controlled.

Electric fences suitable for wild dogs have been developed. Electrifying a fence creates a fear of the fence itself and deters wild dogs from approaching.

For fencing to be successful, it must be possible to eliminate wild dogs from within the fence. The fence must be maintained in good order and occasional mopping-up measures employed to remove intruding animals.

Livestock guardian dogs

Livestock guardian dogs have been used to protect livestock from predators in Europe, Asia and America. Some producers in Queensland's south-east have decreased predation on sheep and goats using this method. However, it is less successful on larger holdings where stock are more widely scattered. The use of trapping and poisoning in conjunction with guardian dogs is not recommended.

Poisoning

Baits poisoned with 1080 are the most economic, efficient, humane and effective method of controlling wild dogs, especially in inaccessible or extensive areas. Baits can be laid quickly in large numbers by hand, from vehicles and from aircraft.

Currently there are two poisons legally available for wild dog control. These are 1080 (sodium monofluoroacetate) and strychnine.

A Queensland Health permit is necessary to purchase strychnine. The 1080 poison can be obtained only through licensed Biosecurity Queensland officers and local government operators.

The use of poison baits will control the majority of wild dogs. Problem animals that avoid baits can then be trapped, shot or fenced-out to provide additional control.

Baits may be selectively positioned to avoid killing non-target species, as wild dogs' keen sense of smell enables them to find baits intentionally buried in sand or otherwise hidden. Baits may also be tied to prevent their loss to non-target species.

These bait placement techniques help to:

- reduce the risk of poisoning non-target species
- minimise bait removal by non-target scavengers
- keep the bait moist (longer palatability)
- deter ants (ant-covered baits are believed to be less attractive to dingoes).

Allow a full month for the major effects of baiting to be realised. Heavy rain within two weeks of baiting can leach 1080 from the bait.

Management strategies

It is generally accepted that wild dogs are in fewer numbers statewide due to the use of 1080 over the past three decades.

To increase baiting effectiveness and the duration of low wild dog numbers, it is essential that baiting programs be coordinated among adjoining properties. Baiting individual properties may result in reduced wild dog numbers in the short term, but the benefits of this will be short-lived due to rapid re-invasion.

Research has shown that recolonising wild dog populations are more prone to attack livestock than uncontrolled wild dog populations. Thus, livestock producers should aim to create a wild dog-free buffer of 10–15 km around grazing areas by regular baiting.

The principal source of re-colonising populations comes from immigration, not increased birth rate of remaining wild dogs.

The timing of control should consider seasonal variations in the availability of water (where water is restricted) and then target watering points. The phase of the biological cycle could also influence the likelihood of wild dogs coming into contact with baits and should be considered. Many graziers bait twice a year to target adults during peaks in activity associated with breeding (April/May) and then again in August/September to target pups and juveniles.

A suggested practice is to lay baits in the cooler months when birds and goannas are less active and wild dogs more active.

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The rabbit and its control

Oryctolagus cuniculus



Declaration details

The rabbit is a declared Class 2 animal under the *Land Protection (Pest and Stock Route Management Act) 2002*.

Description and general information

Rabbits are one of Australia's major agricultural and environmental animal pests, costing the country between \$600 million and \$1 billion annually. They compete with native animals, destroy the landscape and are a primary cause of soil erosion by preventing regeneration of native vegetation.

Pet rabbits

Introducing and selling rabbits in Queensland is not permitted (max. penalty \$40 000). Limited numbers of permits for domestic rabbits are only available from Biosecurity Queensland for research purposes, public display, magic acts or circuses. Before a permit is granted, a number of guidelines need to be fulfilled.

Habitat

Rabbits are adaptable and sometimes live in close association with people. They live in built environments such as:

- in and under buildings
- old machinery and storage containers
- in old dumps.

In rural environments rabbits frequently live in:

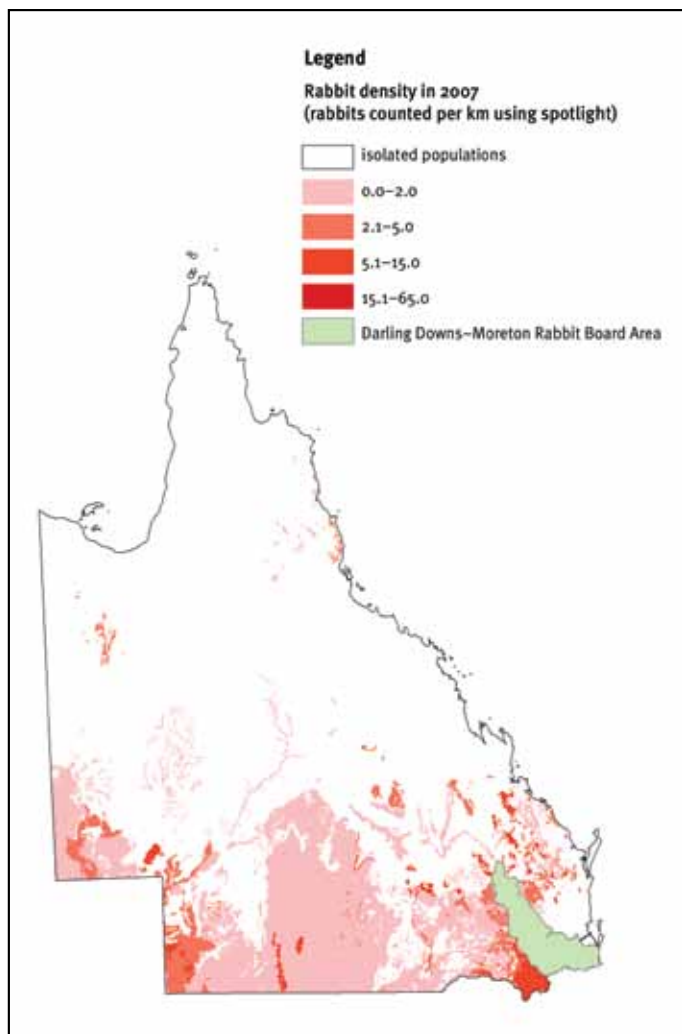
- felled timber and associated windrows
- tussock grasses and rocky areas
- warrens (if soils are easy to dig).

Rabbit warrens

Rabbits prefer to live in warrens as protection against predators and extremes in temperature. However, they will survive in above-ground harbours such as logs, windrows and dense thickets of scrub (e.g. blackberry and lantana) or under built harbour, old sheds and machinery etc. In newly colonised areas without warrens, rabbits tend to live in 'scrapes' (or 'squats').



Queensland Government



Number of rabbits likely to be seen with a spotlight at night. Darker areas indicate more suitable rabbit habitat

Breeding

Does (females) are pregnant for 28–30 days, but are able to mate within hours of giving birth. The average litter is 3–4 kittens but varies from two in a young doe, up to eight or more in a mature doe, and depends on the amount and quality of food available. Five to six litters are possible in a good season.

Young does can breed at four months of age if conditions are suitable.

Where to start control

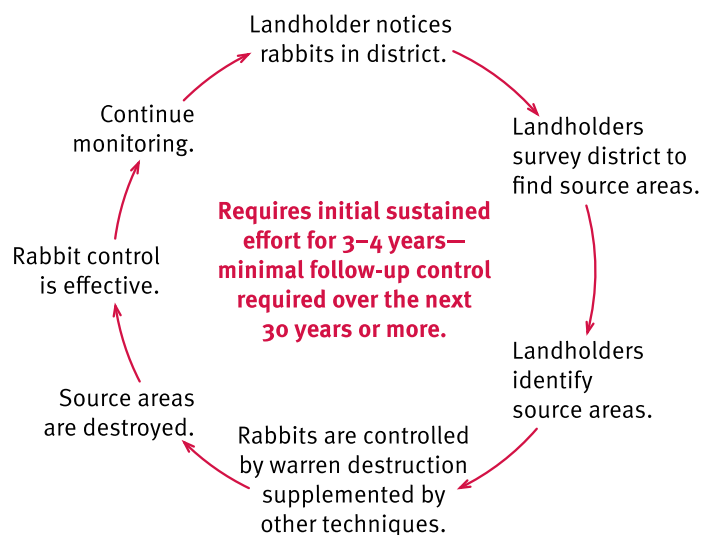
For effective long-term rabbit control, concentrate on destroying source areas. Source areas will all have well-established warrens or ready-made structures that are cool and provide protection from predators. A source area must also have a good supply of green feed during the cooler seasons.



Rabbits on a warren

Coordinating control

Rabbit control is best done as a joint exercise involving all land managers in the district. Cost-effective, long-term results can be achieved in rabbit control by following the methods outlined below.



Effective rabbit control cycle

Control

Integrated control

Landholders should adopt an integrated control approach, incorporating appropriate strategies from those listed below. Landholders must understand that biological control agents such as myxomatosis and rabbit hemorrhagic disease virus (RHDV) are not a complete solution to rabbit problems. It is essential to incorporate them into a management strategy with other control techniques.

RHDV offers landholders a major opportunity to reduce rabbit numbers; however, failure to combine RHDV with other control strategies could cause rabbit immunity to develop (as occurred with myxomatosis).

Destroying a rabbit's home (e.g. warren) is the most effective method for long-term control.

Conventional control methods, such as fumigating, ripping warrens and harbour destruction, are essential for the continued long-term reduction of rabbit numbers.

Warren ripping

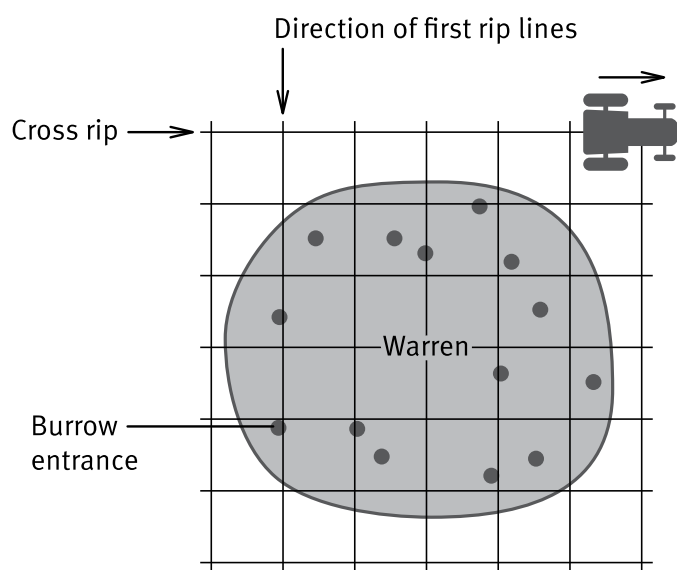
In areas where rabbits live in warrens, ripping is the most effective method of long-term control. Ripping is so successful because warrens can rarely be reopened and rabbits are unable to recolonise these areas.



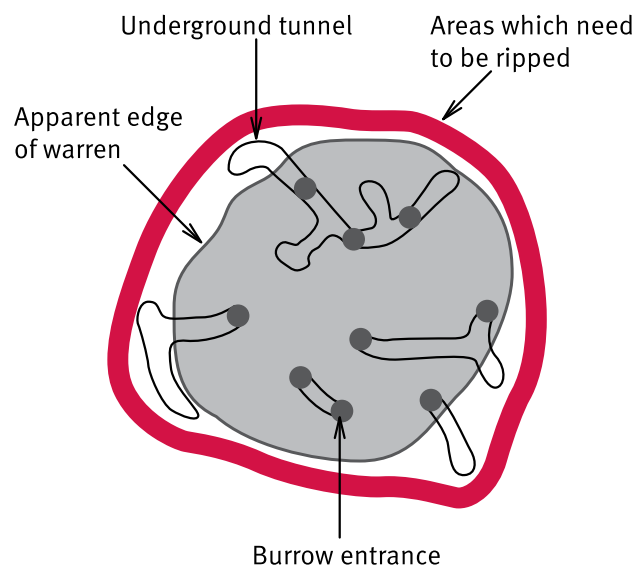
Tyne for ripping warrens (photo courtesy Mark Ridge)

To get the best results it is important to chase as many of the rabbits inside the warren as possible. Dogs can be used to drive rabbits into the warren before ripping starts.

The aim of ripping is to completely destroy the warren. It involves using a tractor with a tynd (sharp-pronged) implement—one tyne or many—that rips through the warren and collapses it. Larger tractors and dozers are more appropriate for properties with many warrens as they are able to move faster and rip wider.



Direction to rip warrens (illustration courtesy Will Dobbie)



Extent to rip warrens (illustration courtesy Will Dobbie)

Obviously, ripping is not suitable for warrens located underneath buildings or on steep rocky country. In such cases, other methods (poison baiting, releasing virus or fumigating burrows) should instead be used to reduce rabbit numbers. Warrens should then be either filled in or covered to stop rabbits from re-establishing. Burrows can be blocked with small boulders or rocks (see photo below).



Rock blocking rabbit hole

Harbour destruction

Where there is abundant surface harbour, a high proportion of rabbits may live above ground rather than in underground warrens. Rabbits can make their homes in windrows, dense thickets of shrubs (such as blackberries and lantana) and even in old machinery.

To eliminate these above-ground breeding areas, it may be necessary to:

- burn windrows and log piles
- remove noxious weeds through chemical and physical control
- remove movable objects (such as old machinery) from paddocks.

Sometimes removing harbour can expose warrens underneath. If this happens, the warrens need to be ripped.

Poison baiting

Baiting is not effective as a sole control method and will not eradicate an entire rabbit population. Numbers will quickly increase again, and you will have to continue baiting year after year with no permanent overall change in the rabbit population.

Rabbits can also become 'bait shy' and this method becomes less and less effective over time. Ideally, baiting is best used either before ripping/fumigation to reduce a population, or after ripping/fumigation as a 'mop-up'.

Baiting works best when rabbits are not breeding. During breeding season the majority of the population feeds over a larger-than-normal area, and it is the young rabbits that are most likely to take baits. While numbers will be reduced, animals of breeding age are not likely to be affected.

1080—sodium fluoroacetate

Pre-feeding is required when using 1080 because rabbits will not readily take new feed. The poison-free bait should be laid at least three times over a one-week period before the poisoned bait is laid. (1080-impregnated carrot baits are the most common form of bait used.) The practice helps to ensure that, when the poisoned bait is laid, it will be eaten by most of the rabbit population.

1080 can only be supplied through persons authorised under the Health Act. Your local Biosecurity officer or your local government office should be able to assist you.

Pindone

Pindone is an anticoagulant registered for rabbit control. This poison works by preventing blood from clotting. In Queensland, it is not recommended for broadacre use and is mainly used in urban areas and near farm buildings.

Pindone works best when given as a series of small doses/feeds over a period of three days. Although pre-feeding is not essential, it does enhance the bait uptake by shy rabbits as they get used to the feed prior to any poison bait being laid. To be effective, pindone requires multiple feeds so that the poison can build up to fatal levels in the rabbit's body. Feeding over a number of nights provides plenty of opportunity for most of the rabbit population to consume the required lethal dose. Rabbits poisoned with pindone will usually die within 10–20 days.

Pindone baiting does not work well when there is a lot of green pick around for rabbits.

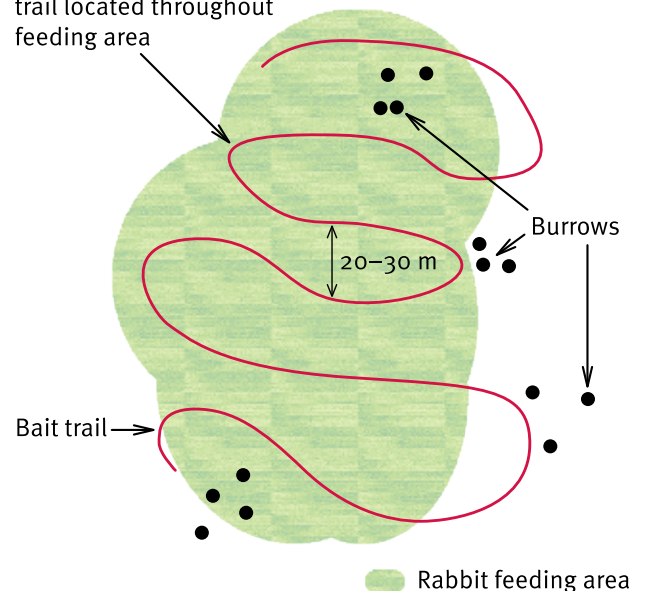
Poison bait trails

It is important that bait trails are laid properly to ensure the best results. 'Baitlayers' make it easier to put out bait trails at the correct rate, and they can be towed behind most 4WD vehicles, quad bikes and tractors.

When scratching and laying a trail, consider the following:

- Rabbits like freshly scratched/disturbed soil—this may be because rabbits are territorial and inspect newly disturbed soil, and/or the disturbed vegetation smell attracts them.
- Lay trails around warrens and in the areas where rabbits most often feed.
- Laying trails on slopes and hills requires care—it can cause erosion in some soils types (e.g. granite and traprock). Trails are best laid in a zigzag pattern in steep terrain to minimise erosion.
- A trail that has been scratched for the first feed is easy to follow for the rest of the baiting program.
- The soil should be turned only enough to scratch the surface—don't plough the ground.
- A trail that has been scratched too deep will spook the rabbits because they will not have full sight of their predators.
- Where vegetation is thick, or it is difficult to find the main feeding areas, lay bait trails in a grid pattern across the site.
- As a general rule, avoid crossing the bait trail—it can cause confusion when you try to follow the same trail on subsequent occasions.

Free-feed and poison feed trail located throughout feeding area



Method for laying a bait trail (illustration courtesy Animal Control Technologies)

Bait trails will be most effective if you follow these guidelines:

- Use good quality, non-contaminated bait material. (Simple rule: if you wouldn't eat it, the rabbit won't either.)
- Use enough feed to bait all the rabbits in the area. (The pre-feed will give an indication of the potential bait take.)

- Expect a greater uptake of pre-feed and bait material when vegetation is scarce, dried off or soured.
- Ensure that all the preparation equipment is clean and free of any chemical residues or smells—rabbits can be very shy of unusual odours.
- When there are kittens in a warren, lay the bait trail close to the warrens.

Fumigation

Fumigation is labour intensive and time consuming, and is not usually an effective method if used alone. However, as a ‘mop-up’ technique or control method for use in areas where ripping is not practical (e.g. steep and rocky terrain), it may be a good alternative.

Because this technique relies on directly affecting the rabbits, and does not affect the structure of the warren, it is crucial that as many rabbits as possible are underground when fumigation is carried out. Rabbits usually take refuge in their burrows from mid-morning to mid-afternoon and during hot weather so these are the best times to fumigate. Dogs can also be used to drive rabbits into their warrens.

For best results, fumigation should be carried out in two stages—initially, before the breeding season starts (as this reduces the breeding stock), and then again during the breeding season.

There are two types of warren fumigation—static and pressure. In Queensland, static fumigants are a more popular and safer option for controlling rabbits and will be explained below.

Static fumigation

This method is easy to use, and time- and cost-effective. Static fumigation comes in the form of aluminium phosphide (phosphine) tablets, which can be purchased from most agricultural suppliers. These tablets are small and round (about the size of a marble), and weigh 3 g. Trade names for phosphine include Pestex®, Quickphos® and Gastion®. General directions for the use of phosphine tablets appear below, but always refer to the manufacturer’s specific recommendations for use.

To fumigate warrens using phosphine tablets:

1. Find all warren entrances—both active and inactive.
2. Cut back the warren entrance at right angles using a shovel.
3. Separately wrap two tablets in moistened absorbent paper (toilet paper/paper towels).
4. Insert the tablets as far down into the entrance as possible. (Polypipe and a push rod can be used to help push the tablets down.)
5. Push some scrunched-up newspaper down the hole to block the entrance and then cover it up with soil and, if possible, a rock.

6. Treat all entrances to the warren (active and inactive) the same way.
7. Check warrens about a week after fumigation and re-fumigate any reopened entrances.

Once in the warren, the moistened tablets react with air to release a toxic gas, which spreads quickly throughout the warren. The phosphine gas itself is invisible and odourless but leakages from the warren can be detected by the smell of ammonia. (This is a safety mechanism that is built into the tablet.) Any leakages need to be blocked immediately.

Biological controls

Rabbit hemorrhagic disease virus (also known as rabbit calicivirus disease)

RHDV is a virus specific to rabbits which works by infecting the lining of the throat, lungs, gut and liver.

RHDV relies primarily on direct rabbit-to-rabbit contact in order to spread. High rabbit numbers are therefore needed before this control method will be effective.

After RHDV has infected an area, it is important to use another method for follow-up control to increase the likelihood that the population is eradicated before it is able to develop resistance and increase its numbers again.

Resistance to RHDV depends primarily on the age of the rabbit. Therefore, it is better for RHDV to go through a rabbit population after rabbits have bred and the young are old enough to be affected by the virus. Rabbits that survive RHDV develop antibodies against the virus. Breeding females can also pass these antibodies on to the young (through antibodies in their milk), conferring temporary protection on rabbits up to 12 weeks old.

Myxomatosis

Myxomatosis is no longer produced as a laboratory strain but field strains are still known to recur and affect rabbit populations.

Trapping

Trapping is an extremely labour-intensive control method and requires a skilled operator to set the traps to successfully capture rabbits.

If you do plan to trap rabbits on your property, common sense and respect for animal welfare are essential. While there are currently no strict guidelines for the use of traps in Queensland, it is an area of growing concern for animal welfare advocates.

Cage trap

A cage trap has a lever that closes the cage when a rabbit steps on it. The rabbits are lured into the cage with bait—usually diced carrot. Traps need to be disabled and left open for two or three nights with bait leading into the cage. This entices rabbits to enter. A trap can be set once a rabbit has consumed a trail of bait all the way into that

trap. Traps should be checked and emptied regularly—usually a couple of times a night.

This effective and humane technique is most useful for removing any remaining rabbits from places like hay sheds and after the shed has been fenced to prevent additional rabbits from entering and leaving. Free-feed then trap, and keep the shed rabbit-proof to prevent rabbits recolonising.

Barrel trap

A barrel trap is designed specifically for rabbits. It is cylindrical, made of light mesh, and is about 1 m long and 15 cm in diameter. The trap has one open end with two hinged trap doors along its side. The open end is placed in the burrow, and the hinged gates close and trap the rabbit after it enters from the burrow.

The trap can be left in the burrow entrance for a number of days. However, it must be checked at least daily so that if a rabbit has been caught it does not suffer and animal welfare responsibilities are met.



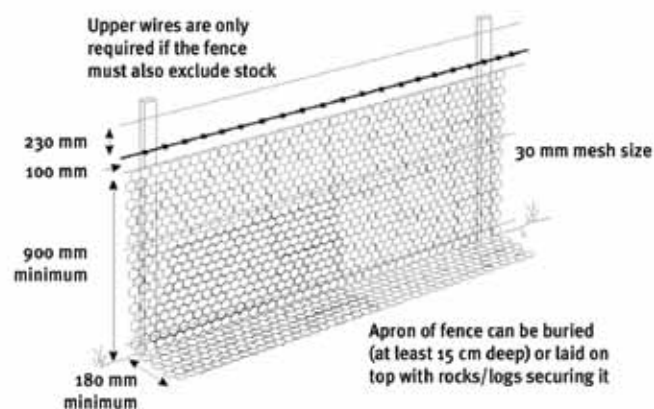
Barrel rabbit trap in hole

Exclusion fencing

Rabbit exclusion fences are built with the aim of keeping rabbits out of a particular area. It is appropriate for small, high-value areas that require protection. A fully fenced area will only remain rabbit-free in the long term if all rabbits are removed from the enclosed area after fencing and the fence is regularly maintained and checked for holes.

A rabbit-proof fence should be made of wire mesh netting (40 mm or smaller) and needs to be at least 900 mm high. The netting should also be buried to depth of at least 150 mm. Gates into the fenced area need to be rabbit-proof as well.

Electric fencing is a cheaper alternative, but it is not a complete physical barrier and is also prone to damage from other pest animals and stock.



Exclusion fence for rabbits (illustration courtesy DEWHA)

Shooting

Shooting is most useful when used to 'mop up' after other control methods (such as ripping). To get the best results, shoot at the time of day when rabbits are active. This is usually in the early morning, late afternoon or at night. The best and most economical firearm to use is a .22 calibre rifle.

If your property is within an urban area, you will need to comply with local government regulations and the *Police Powers and Responsibilities Act 2000*, which restrict the use of firearms.

Further information

For further detailed reading information on specific rabbit control techniques or costing your rabbit control please refer to Rabbit control in Queensland; a guide for land managers. Download from the Biosecurity Queensland website at www.biosecurity.qld.gov.au

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Feral cat ecology and control



A descendant of the African wild cat (*Felis silvestris lybica*), the common 'house' cat (*Felis catus*) has now been domesticated for about 4000 years. Although the domestic cat has a long history of association with humans, it retains a strong hunting instinct and can easily revert to a wild (feral) state when abandoned or having strayed from a domestic situation.

Semi-feral cats live around dump sites, alleys or abandoned buildings, relying on humans by scavenging rubbish scraps and sheltering in abandoned structures. The true feral cat does not rely on humans at all, obtaining its food and shelter from the natural environment.

Declaration details

The feral cat is declared as a Class 2 species under the *Land Protection (Pest and Stock Route Management) Act 2002*. Declared species represent a threat to primary industries and natural resources, and have a social impact on other human activities.

Legislation describes a feral cat as one that is not fed and kept by someone. The word 'kept' specifically means that the cat is housed in a domestic situation.



Description and general information

The feral cat differs little in appearance from its domestic counterpart; however, when in good condition, the feral cat displays increased overall muscle development, especially noticeable around the head, neck and shoulders, which gives the animal a more robust appearance. The average body weight of male feral cats is 3–6 kg, while females weigh 2–4 kg. Body weights vary with condition, with some extremely large specimens documented.

Australian feral cats are predominantly short-haired, with coat colours that range between ginger, tabby, tortoiseshell, grey and black. White markings may be present on the feet, belly, chest and throat; completely white feral cats are extremely rare. In established populations, coat colours are the result of a natural, genetically selective process. Terrain, predators and the ability to capture prey limit coat colours to those that provide the most suitable camouflage and cause a predominance of these colours in subsequent offspring. Ginger cats are more likely to be found in the semi-arid and desert areas, while grey and black specimens generally predominate in scrub and more heavily timbered habitats.

The feral cat is most active at night, with peak hunting activity occurring soon after sunset and in the early hours before sunrise. At night the cat displays a distinctive green eyeshine under spotlight, making it easily distinguishable from other animals. During the day it will rest in any number of den sites, which may include hollow logs, dense clumps of grass, piles of debris, rabbit burrows, and even the hollow limbs of standing trees.

The most obvious and characteristic field signs of feral cats are their scats (droppings). Unlike the domestic cat, the feral cat does not bury its scats, but leaves them exposed at prominent sites to warn other cats of its territorial boundary.



History of introduction and dispersal

There is some evidence to suggest that the cat was present in Australia long before European settlement. This may have occurred as a result of Dutch shipwrecks and regular visits to northern Australia by early South-East Asian vessels as long as 500 years ago.

Post-settlement dispersal resulted from cats straying from areas of early colonisation. In the late 19th and early 20th centuries, large numbers of cats were purposely released in many rural areas to combat plague numbers of rabbits. Unwanted cats continue to be released into urban and rural areas by irresponsible pet owners.

The feral cat is now present Australia-wide, thriving under all climatic extremes and in vastly different types of terrain.

Population dynamics

Male cats attain sexual maturity at about 12 months, whereas females are capable of reproduction at approximately seven months. Annually, and under ideal conditions, an adult female can produce up to three litters—each of usually four kittens, but varying from two to seven.

As the breeding instinct is triggered by the increasing length of daylight, litters are less frequent in winter. Most reproduction occurs during the spring and summer months, and is generally limited to two litters per year. Birth follows a gestation period of 65 days, and kittens may be reared in a single den site or may be frequently shifted to other sites within the female's home range. Family and litter bonding begin to break down when the kittens are approximately seven months old. The female's ability to bear litters does not decrease with age, so reproduction continues for the course of her life.

Social organisation and behaviour

Feral cats maintain stable home ranges, the sizes of which depend upon the relative abundance of food and the availability of suitable den sites. Dominant male cats may have territories of up to 8 km², while the territories of females are smaller and may even be halved while kittens are being reared.

Scent glands are present on the chin, at the corners of the mouth, and in the anal region. Territorial boundaries are maintained by scent marking with the cheek glands, pole-clawing, urinating and leaving exposed faecal deposits.

Although feral cats are often thought of as being solitary animals, studies show this behaviour is generally limited to hunting activities. At other times feral cats display a degree of social interaction that peaks during the breeding season. Group behaviour has been observed in semi-feral populations, and it has been suggested that such behaviour is exhibited also in feral populations.

Groups usually comprise several related adult females, their young of both sexes, and an adult male—whose range may include other groups of females. Young females usually remain in a group, while young males either leave or are driven from the group as they reach sexual maturity.



Effects on wildlife

The energy expended by an adult male cat requires it to consume 5–8% of its body weight in prey per day, while females raising kittens require 20%. Based on these figures, one study concluded that 375 feral cats on Macquarie Island would consume 56 000 rabbits and 58 000 sea birds per year. Where present on the mainland, rabbits may comprise up to 40% of a feral cat's diet. Cats are successful as a control mechanism only when rabbit densities are low. At other times cat predation does little to halt the build-up or spread of rabbit populations; rabbits merely help to support a larger number of cats. When seasonal shortages of rabbits occur there is a corresponding rise in the number of native animals taken by cats.

The feral cat is an opportunistic predator, and dietary studies have shown that small mammals, birds, reptiles, amphibians, insects and even fish can be taken as prey. Cat predation is particularly harmful in island situations, and a number of species have become extinct due to the introduction of cats by early sealers and lighthouse keepers. On the mainland, native animals—which already suffer due to the destruction of their habitats by man and other introduced animals—may be endangered further by cat predation. Actual competition for prey can cause a decline in the numbers of native predatory species such as quolls, eagles, hawks and reptiles.

Not only do native animals bear the brunt of predation, but they also suffer the effects of a parasite that reproduces only in the intestine of the cat. This disease (toxoplasmosis) is particularly harmful to marsupials, which may develop blindness, respiratory disorders, paralysis, and suffer the loss of offspring through abortion and stillbirths.

Exotic disease—rabies

Due to their widespread distribution, feral cats may prove to be a major vector for this fatal viral disease if it ever enters Australia. Overseas studies have revealed that wounds inflicted by rabid cats are more dangerous than those caused by rabid dogs. While the bites of rabid dog are generally inflicted on the arms and legs, the cat attacks the head of its victim, biting and clawing viciously. These head and facial bites reduce the time taken for the virus to enter the central nervous system, lessening the chance of success from subsequent remedial treatment.

Control

Exclusion

Fencing is the only feasible method of control when special areas need protection from cats. Feral cats have been successfully prevented from climbing over netted fences that use an electrified wire mounted 15 cm from the top and 10 cm outward from the fence. Non-electrified fencing should incorporate a netted ceiling, or a curved overhang, which prevents the cat from climbing straight up and over the fence.

Shooting

Night shooting is assisted by the cat's distinctive, green eyeshine. Cats have been successfully attracted by the use of a fox whistle.

Poisoning

Registration of the vertebrate pesticide sodium fluoroacetate (1080) is currently being sought for the control of feral cats where conditions for its use are suitable.

Audible recorded lures for feral cats and other predators are available through a number of sources. These recordings mimic the distress call of a small animal and can be used to draw a predator to a bait or trap site.

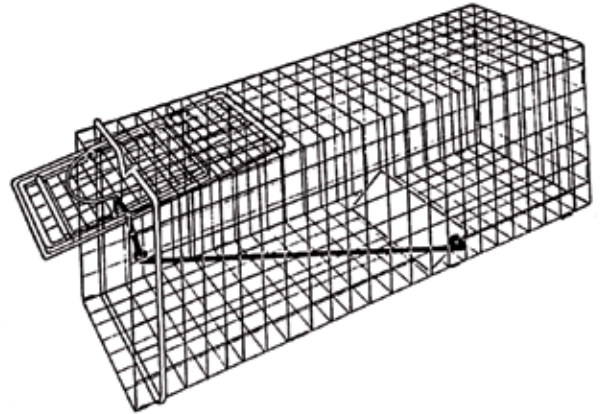
Trapping

Rubber-jawed, leg-hold traps (see below) can be laid in the same manner as they are laid for dingoes and foxes. Leg-hold traps can work well with true feral cats, which would normally avoid the live-capture box traps.

Ideal sites are those where territorial markers, such as faecal deposits and pole-clawing, are noticed. Tuna fish oil has shown some success as an attractant; however, feral cats seem more readily attracted to a site by some visual stimulus such as a bunch of bird feathers hung from a bush or stick.

Cats are easily trapped in wire 'treadle-type' box traps (see diagram at right). This method is most practical for semi-feral urban cats. Attractants/lures may be of meat or fish and should be placed so that they cannot be reached through the wire and be retrieved by clawing.

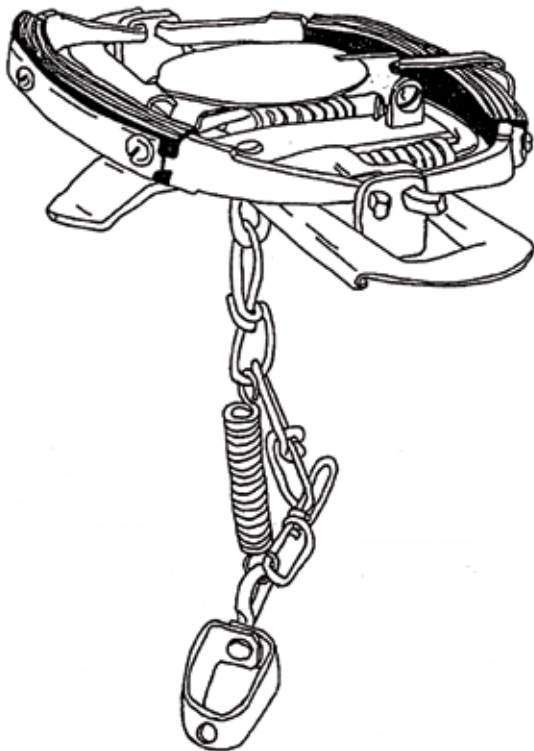
A number of local governments lend cat traps for the purpose of removing stray and feral cats in urban situations.



Treadle box trap

Further information

Further information is available from your local government office, or by contacting Biosecurity Queensland (call 13 25 23 or visit our website at www.biosecurity.qld.gov.au).



Rubber-jawed leg-hold trap

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Fireweed

Senecio madagascariensis



Fireweed is an introduced weed that competes strongly with pasture species and is toxic to livestock. It is responsible for illness, slow growth and poor conditioning of cattle, and can result in death.

Heavy infestations of fireweed often result from neglect of steadily increasing fireweed infestations in previous years, and lack of good ground cover caused by overgrazing, drought, fire or slashing.

Declaration details

Fireweed is a declared Class 2 plant under the *Land Protection (Pest and Stock Route Management) Act 2002*. A Class 2 pest is one that has already spread over substantial areas of Queensland, but its impact is so serious that we need to try and control it and avoid further spread onto properties that are still free of the pest. By law, all landholders must try to keep their land free of Class 2 pests and it is an offence to keep or sell these pests without a permit. A local government may serve a notice upon a landholder requiring control of declared pests.



Queensland Government

Description and general information

Fireweed is an annual or a short-lived perennial. It is a daisy-like herb that can vary greatly in size and shape depending on environmental conditions. In dry, harsh conditions it may be less than 20 cm tall with narrow leaves, no branching and few flowers. In ideal conditions fireweed will grow to 50 cm tall with multiple branches, long wide leaves (6 cm × 2 cm) and about 100 flowers.

The leaves are alternate, dark green with serrated margins, and are usually 2–6 cm long. The flowers are bright yellow, daisy-like with a diameter of approximately 2 cm, and produce up to 100 seeds each. It is very similar to a range of native *Senecio* species.

Seeds are small, cylindrical in shape, and 2–3 mm long. Each seed has rows of very fine short hairs and a silky pappus (parachute). Flowers and seeds are produced continuously over the growing season. An average plant can produce over 10 000 seeds during this time.

Fireweed has a shallow branched taproot with many fibrous roots. The shallow roots often allow plants to fall over in windy conditions. When this happens the stem will sprout roots wherever it touches the ground.

Life cycle

Fireweed can be an annual but many plants do survive through the summer, so plants of all ages can be present at the same time.

Seeds germinate in mild, warm conditions (15–27 °C) in the presence of light and moisture. Most seedlings appear between March and June then grow quickly to produce their first flowers in 6–10 weeks.

Fireweed usually begins to die back in spring. The top growth dies, leaving the base and roots that can last through the summer and re-grow in the following autumn. Depending on rainfall, some plants continue to grow and produce flowers, and seed through summer.

A dry summer followed by autumn or winter rains leads to heavy fireweed infestations.

Poisoning

Unless fireweed poisoning is severe it can be difficult to detect, because the symptoms (such as reduced weight gain and/or low milk production) can have a variety of causes.

Symptoms of more severe poisoning are loss of appetite, aimless wandering, loss of coordination, sensitivity to sunlight, jaundice and abdominal straining with rectal eversion. Severe poisoning will result in death, and an autopsy will reveal chronic liver sclerosis.

All growth stages contain pyrrolizidine alkaloids that damage the liver. Fireweed is toxic when green or dry, therefore contaminated hay or silage may be toxic.

Fireweed is generally unpalatable to cattle, so poisoning is most likely to occur when fireweed plants are dense and stock can not feed selectively, or when there is a shortage of pasture and hungry stock are less selective about food.

Sheep and goats are less susceptible to fireweed poisoning and can graze in fireweed-infested paddocks for at least one season. Toxins found in fireweed are able to taint the milk of goats that graze this plant. Goats for milk production should not be allowed to graze in fireweed-infested paddocks.

Habitat and distribution

Fireweed is native to Madagascar and southern Africa, and was first recorded in Australia in the Hunter Valley in 1918. It is not known how it was introduced, but it could have been brought in privately as a garden plant. It spread slowly at first, but in the last 30 years it has rapidly increased its range, most likely aided by modern transport and rural practices.

Fireweed is a weed of beef and dairy pasture east of the Great Dividing Range, and is currently established along the entire New South Wales coast and north to Brisbane.

Isolated infestations have been found near Caboolture, Cooroy, Belli Park, Maleny, Yandina, Pelican Waters and as far north as Gympie.

Fireweed is spreading northward and has the potential to infest extensive areas of valuable pasture north of Brisbane. A prediction based on climate and land use suggests that fireweed has the potential to be a serious pest as far north as Rockhampton.

Even light infestations of fireweed can produce 1 million seeds per hectare. Seeds are light and have a pappus that enables them to be carried by the wind. The seeds also have rows of short hairs that can loosely cling to animals. Fireweed can be spread short distances by wind and stock. However, it is spread over greater distances in pasture seed, hay, turf, mulch and with stock transport. Fireweed seed can also be spread as a contaminant in transported materials such as hydromulch and grass seed.

Control

Management strategies

The best approach to fireweed control is to prevent it establishing by ensuring that there is a dense cover of pasture in autumn and winter. Waiting until autumn to begin pasture improvement will worsen the fireweed problem because fireweed (which germinates in autumn) will be promoted ahead of the pasture by fertilising and direct drilling of winter pasture species.

When small infestations of fireweed are identified, act immediately to prevent the situation from becoming worse and to increase the likelihood of eradication.

The best control for fireweed incorporates integrated management strategies, including herbicides and mechanical methods in addition to vigorous permanent pastures that can compete strongly with fireweed seedlings.

Biological control

A number of organisms can be found attacking fireweed, but any effect they have is temporary and isolated. An orange rust (*Puccinia lagenophorae*) is common and often affects fireweed, particularly in lower country. The blue stem borer moth (*Patagoniodes farinari*) is also common, but the larvae usually develop too slowly to have an impact. Two moths imported from Madagascar were host tested. In controlled tests they were found to feed on important non-target plants so no releases were made and all these insects were destroyed.

Other potential biological control agents have been identified, but rigorous testing is needed to ensure that they do not feed on closely related Australian native plants. No new agents are expected to be released in the near future.

Mechanical control

Chip out, bag and burn any isolated plants or dispose of them at council-approved landfill tips. You should not burn any toxic plants in household wood-burning stoves or heaters. Remove chipped-out plants from paddocks because they may still set seed and poison stock.

Slashing is usually not effective as it may lead to increased stock poisoning. Slashing tends to give a good visual effect because it removes the flowers, but at best it delays flowering and seeding and at worst damages the pasture, making conditions more favourable for fireweed.

Fireweed remains toxic after being cut and becomes more attractive to stock and thus more likely to cause poisoning.

Herbicide control

Herbicides are most effective if sprayed before plants reach maturity. However, application during flowering will be effective if higher recommended rates of herbicide are applied.

Research is ongoing at the Alan Fletcher Research Station for herbicide controls against fireweed, including residual control methods. Trials have shown herbicide application in the autumn period during April provides good control. Before undertaking such programs landholders are advised to determine the infestation levels.

An effective application method in an open pasture situation is a boom spray. Follow this up by spot spraying, or pulling and bagging any regrowth or missed plants.

Boom spraying is also suitable for follow-up treatments, as it allows destruction of immature plants, which may otherwise grow to re-seed the area before they can be noticed.

Bromoxynil (trade names Bromicide 200, Brominil 200 and Buctril 200) is suitable for use in pastures containing clovers, medics and lucerne, and it will not affect grass.

Bromoxynil is effective if used on seedlings, which usually appear in autumn and early winter but may appear later following rain. Twice as much bromoxynil is needed if it is applied to plants that are just beginning to flower. Bromoxynil is less effective on mature plants, as it is a contact herbicide only. Mature plants will only be killed off where the bromoxynil comes into contact with the plant, allowing recovery of the plant from lower, untouched portions.

Unfortunately, fireweed control is often not considered until the highly visible flowers appear and it is too late for effective control with herbicide.

Table 1 (overleaf) lists herbicides registered for fireweed control. Before using any herbicide always read the label carefully. All herbicides must be applied strictly in accordance with the directions on the label.

Further information

Further information is available from your local government office, or by contacting Biosecurity Queensland (call 13 25 23 or visit our website at www.biosecurity.qld.gov.au).

Table 1 Herbicides registered for the control of fireweed

Situation	Herbicide	Rate	Registration status	Comments
Agricultural non-crop land, bushland, forests, wetlands, coastal and adjacent areas	2,4-D (625 g/L)	300 ml/100 L water or 3 L/ha	PERMIT 11463	Spot spray only.
Agricultural non-crop land, commercial and industrial land, forests, pastures and right-of-way areas	Aminopyralid (10 g/L) + fluroxypyr (333 g/L)	500 ml/100 L water	Registered	Apply as a high-volume or spot spray to flowering plants up to 30 cm tall.
Agricultural non-crop land, commercial and industrial land, forests, pastures and right-of-way areas	Triclopyr (300 g/L) + picloram (100 g/L) + aminopyralid (10 g/L)	350 ml/100 L water	Registered	Apply as a high-volume or spot spray when the plant is flowering.
Agricultural non-crop land and pastures	2,4-D (300 g/L)	700 ml/100 L water	Registered	Apply as a high-volume spray when the plant is actively growing.
Pastures and improved pastures (containing clover and/or lucerne)	Bromoxynil (200 g/L)	1.4 L/ha seedling control, 2.8 L/ha for early flowering plants	Registered	Apply during the autumn–winter period when plants are young and actively growing. Not effective on mature plants.
Improved pastures (containing clover and/or lucerne)	Bromoxynil (250 g/L) + diflufenican (25 g/L)	500 ml/ha	Registered	Seedling control up to the four leaf stage
Improved pastures (containing clover)	MCPA (250 g/L) + diflufenican (25 g/L)	1 L/ha	Registered	Seedling control up to the four leaf stage

It is a requirement of a permit that all persons using the products covered by the off-label permit PER11463 comply with the details and conditions listed in the permit. In addition, read the herbicide label carefully before use and always use the herbicide in accordance with label directions. The above permit can be used by pest control operators, members of environmental groups such as Bushcare, Catchment Care, Coast Care, and people employed as or working under supervision of local and state government officers.

Fact sheets are available from Department of Employment, Economic Development and Innovation (DEEDI) service centres and our Customer Service Centre (telephone 13 25 23). Check our website at www.biosecurity.qld.gov.au to ensure you have the latest version of this fact sheet. The control methods referred to in this fact sheet should be used in accordance with the restrictions (federal and state legislation, and local government laws) directly or indirectly related to each control method. These restrictions may prevent the use of one or more of the methods referred to, depending on individual circumstances. While every care is taken to ensure the accuracy of this information, DEEDI does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.

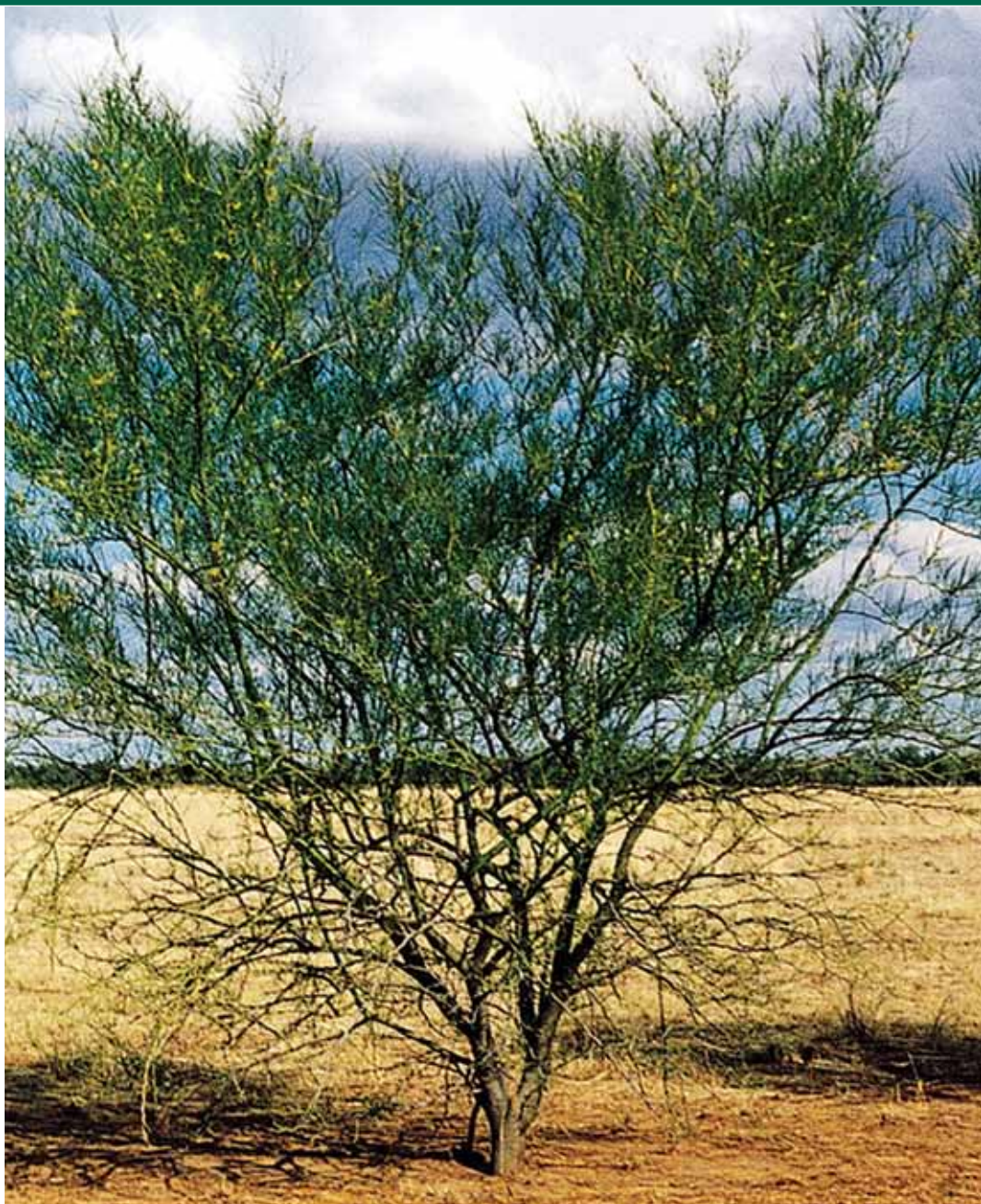
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PR11–5583

Parkinsonia

Jerusalem thorn or jelly bean tree

Parkinsonia aculeata



Parkinsonia is thought to be native to tropical America but has spread throughout the world as an ornamental and shade tree. It has been recognised in Australia as a Weed of National Significance.

Declaration details

Parkinsonia is a declared Class 2 plant under *Land Protection (Pest and Stock Route Management) Act 2002*. Declaration requires landholders to control declared pests on the land and waters under their control. A local government may serve a notice upon a landholder requiring control of declared pests.



Queensland Government



Description and general information

Size and appearance

A hairless shrub or small tree that rarely grows any more than 10 m high, Parkinsonia has slender green photosynthetic zigzag branches armed with sharp spines.

Leaves

Its leaves have a short, spine-tipped stalk, with leaf branches 20–40 cm long, flattened with small, oblong leaflets along each edge.

Flowers

Parkinsonia flowers are yellow, fragrant, five petalled, each on a long, slender drooping stalk. Seeds are oval and hard, about 15 mm long, and borne in pencil-like pods 5–10 cm long, constricted between the seeds.

Lifecycle

Parkinsonia is fast growing and may flower in early summer of its second or third year of growth. Once established, flowering can occur opportunistically to exploit variable seasonal conditions. Pods mature in late summer, float on water and hence are readily dispersed by flood waters.

Under favourable warm and wet field conditions, most seeds germinate within 2 years. However, a small proportion of seed may remain dormant for longer periods if it's under heavy pasture cover, buried deeper in the soil profile, when inundated or when insufficient rain has fallen.

Habitat and distribution

As parkinsonia is adapted to an extremely wide range of soil types, there is little doubt that it will continue to spread through watercourses and adjoining areas throughout the sub-humid and semi-arid environments of Queensland.

The most vulnerable areas are the lower Gulf of Carpentaria region, Lake Eyre catchment especially the Channel country, Central Highlands and Cape York.

Control

Biological control

Three species of insects have been introduced into Australia as biological control agents against parkinsonia.

Parkinsonia seed beetles *Penthobruchus germani* and *Mimosetes ulkei*.

Both *Penthobruchus germani* and *Mimosetes ulkei* are seed beetles that attack only parkinsonia and whose larvae destroy mature parkinsonia seeds.

Penthobruchus germani is a small (5 mm – 6 mm long) brown beetle from Argentina. It was first released in 1995 and has established much more readily than *Mimosetes*. It has established readily at all release sites and spreads rapidly.

Penthobruchus can exert heavy pressure on parkinsonia seeds in some areas. In the field its presence is indicated by white eggs against a darker background of the pods. Round holes in the pods indicate that beetles have emerged.

Mimosetes ulkei is a small (about 5 mm long) two-tone grey beetle from the USA. While it is established at several sites, it does not establish as readily as *Penthobruchus*. It has potential to contribute to the destruction of parkinsonia seeds. In the field, round emergence holes are the only external indication of its presence.

Parkinsonia leaf bug *Rhinacloa callicrates* *Rhinacloa callicrates* is a small green bug (about 3 mm long) imported from the USA. It feeds on leaves and shoots of parkinsonia resulting in tiny round white spots where it destroys photosynthetic tissue. It is well established in Queensland but it has no significant impact on parkinsonia.

Further biological control studies

Research has continued in recent years to survey the native range of parkinsonia for potential new agents. Several prospective insects have been identified and will be subject to host-testing studies prior to release.

Dieback research

Naturally occurring fungal pathogens have been identified as causing dieback within many infestations of parkinsonia across Northern Australia. Studies are continuing regarding the use of these pathogens as biological control tools.

Mechanical control

Initial clearing by stick raking, blade ploughing or ripping is effective, however:

- it is restricted to reasonably level areas away from watercourses
- clearing will hasten seed germination, necessitating follow-up control either mechanically or chemically.

Establishing improved pasture will aid in managing parkinsonia by competition.

Fire

Fire may be a useful tool for the management of parkinsonia infestations. Kill rates may vary from 30% to 90% with best results obtained from slow moving fires.

Fire will destroy seedlings if sufficient fuel load is present, but mature plants will usually survive.

Herbicide control

Herbicides registered for the control of parkinsonia are listed in Table 1.

Aerial application

Aerial application is undertaken by purpose-built applicators by helicopter. This is useful for dense, strategic infestations although it may be expensive on a broad scale.

Foliar (overall) spray

This is an effective control method for seedlings up to 1.5 m tall. Spray leaf and stems to point of runoff. A wetting agent must be used.

Basal bark spray

For stems up to 15 cm diameter, carefully spray around the base of the plant to a height of 30 cm above ground level. Larger trees may be controlled by spraying to a greater height, up to 100 cm above ground level.

Plants should be actively growing and preferably flowering. Field experience has shown that good soil moisture is essential for effective control.

Because parkinsonia infested areas are often subject to flooding, care is needed to ensure mud and flood debris does not prevent spray penetration to the bark. The trunk may need to be cleared before spraying. Addition of petrol or A-1 jet fuel will aid penetration.



Cut stump treatment

Cut stump treatment may be performed at any time of the year. Cut stems off horizontally as close to the ground as possible. Immediately (within 15 seconds) swab or spray the cut surface and associated stem with herbicide mixture.

Soil application

Use one dose of herbicide per metre of tree height. Place doses close to tree trunk, either with spot gun on clear bare ground, or underground with ground injector. Rain or sufficient soil moisture is required before herbicide is taken up by the plant.

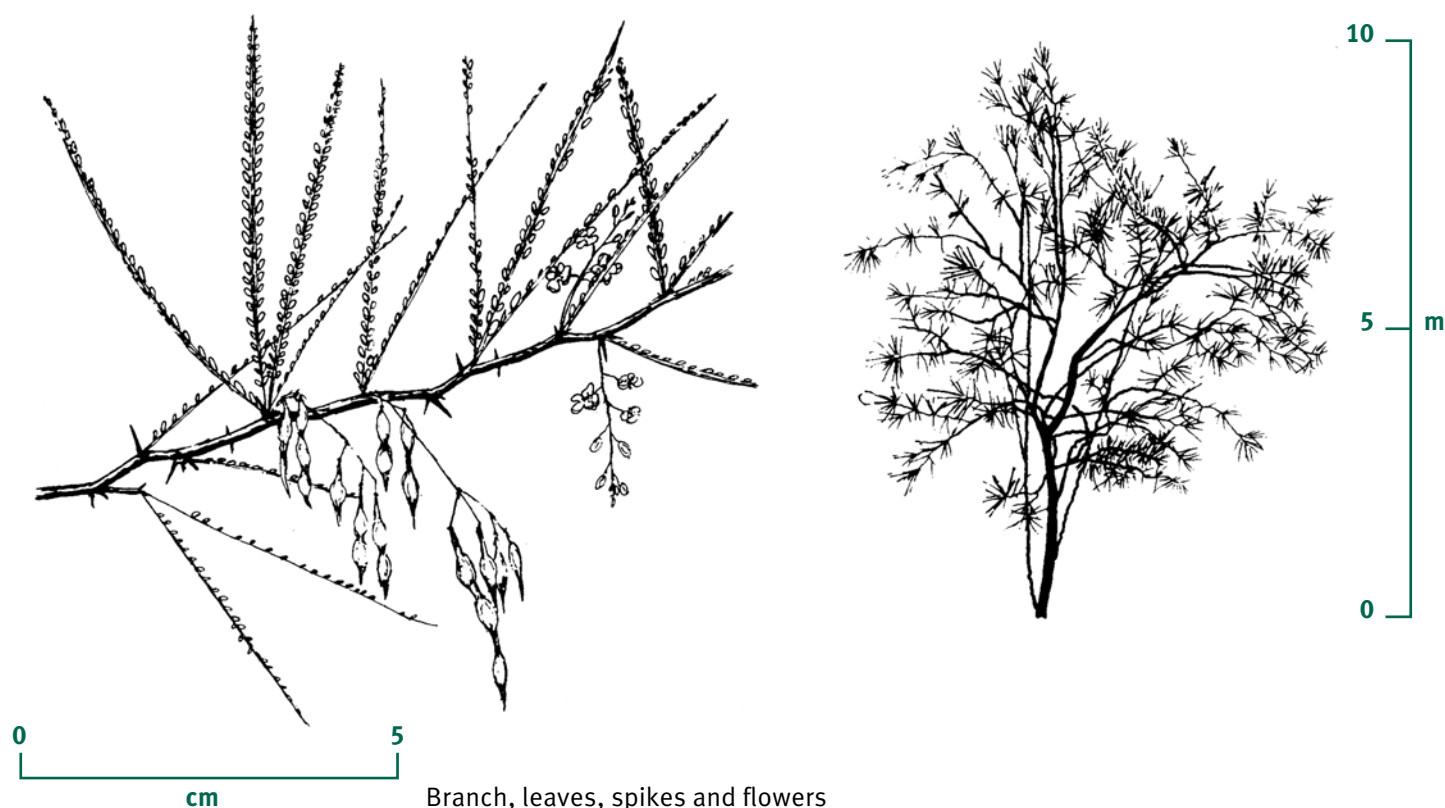
Do not use near watercourses or within a distance equal to at least twice the height of desirable trees.

Further information

Further information is available from your local government office, or by contacting Biosecurity Queensland (call 13 25 23 or visit our website at www.biosecurity.qld.gov.au).

Table 1 Herbicides registered for the control of parkinsonia.

Situation	Herbicide	Rate	Optimum stage and time	Comments
Aerial application	Aminopyralid, picloram and tricopyr e.g. Grazon Extra DS®	3 L/ha	Seedlings 1–2 m tall, or 12–24 months old	Application by helicopter only. Addition of 1 L/ha of Uptake® wetting agent
Foliar (overall spray)	Aminopyralid, picloram and tricopyr e.g. Grazon Extra DS®	0.35 L/100 L water	Seedlings less than 2 m tall and actively growing	Wet plant thoroughly. Use wetting agent
Basal bark spray	Triclopyr and picloram e.g. Access®	1 L/60 L diesel	As above. Stems up to 5 cm diameter	Do not treat wet stems
Cut stump	Triclopyr and picloram e.g. Access®	1 L/60 L diesel	Any time of year	Cut close to ground level and treat immediately
Soil application	Hexazinone e.g. Velpar L® (via spotgun)	4 ml per spot—1 spot for each shrub/tree	Any time, but needs moisture to activate chemical	Shrubs/trees up to 5 m tall
	Tebuthiuron e.g. Grazon Extra DS®	1 to 1.5 g/m ²	Any time, but needs moisture to activate chemical	Refer to label for critical comments



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Parthenium weed

Parthenium hysterophorus



Parthenium costs the beef industry a total of \$16.5 million per year and cropping industries several million dollars per year.

Declaration details

In Queensland, Parthenium is a Class 2 declared plant.

Under the *Land Protection (Pest and Stock Route Management) Act 2002*, Class 2 declaration requires landholders to control pests on the land and waters under their control. A local government may serve a notice upon a landholder requiring control of declared pests.



Queensland Government

Description and general information

Size

Parthenium weed is an annual herb with a deep tap root and an erect stem that becomes woody with age. As it matures, the plant develops many branches in its top half and may eventually reach a height of two metres.

Leaves

Its leaves are pale green, deeply lobed and covered with fine soft hairs.

Flowers

Small creamy white flowers occur on the tips of the numerous stems. Each flower contains four to five black seeds that are wedge-shaped, two millimetres long with two thin, white scales.

Lifecycle

Parthenium weed normally germinates in spring and early summer, produces flowers and seed throughout its life and dies around late autumn. However, with suitable conditions (rain, available moisture, mild temperatures), parthenium weed can grow and produce flowers at any time of the year. In summer, plants can flower and set seed within four weeks of germination, particularly if stressed.

Potential damage

Parthenium weed is a vigorous species that colonises weak pastures with sparse ground cover. It will readily colonise disturbed, bare areas along roadsides and heavily stocked areas around yards and watering points. Parthenium weed can also colonise brigalow, gidgee and softwood scrub soils. Its presence reduces the reliability of improved pasture establishment and reduces pasture production potential.

Parthenium weed is also a health problem as contact with the plant or the pollen can cause serious allergic reactions such as dermatitis and hay fever.

Habitat and distribution

Parthenium weed is capable of growing in most soil types but becomes most dominant in alkaline, clay loam soils.

The plant is well established in Central Queensland and present in isolated infestations west to Longreach and in northern and southern Queensland.

Infestations have also been found in northern and central parts of New South Wales and it is capable of growing in most states of Australia.

Control

Prevention and weed seed spread

As with most weeds, prevention is much cheaper and easier than cure. Pastures maintained in good condition, with high levels of grass crown cover, will

limit parthenium weed colonisation. Drought, and the subsequent reduced pasture cover, creates the ideal window of opportunity for parthenium weed colonisation when good conditions return.

Parthenium seeds can spread via water, vehicles, machinery, stock, feral and native animals and in feed and seed. Drought conditions aid the spread of seed with increased movements of stock fodder and transports.

Vehicles and implements passing through parthenium weed infested areas should be washed down with water. Wash down facilities are located in Alpha, Biloela, Charters Towers, Emerald, Gracemere, Injune, Monto, Moura, Rolleston, Springsure and Taroom. Particular care should be taken with earthmoving machinery and harvesting equipment. The wash down procedure should be confined to one area, so that plants that establish from dislodged seed can be destroyed before they set seed.

Extreme caution should be taken when moving cattle from infested to clean areas. Avoid movement during wet periods as cattle readily transport seed in muddy soil. On arrival, cattle should be held in yards or small paddocks until seed has dropped from their coats and tails prior to their release into large paddocks. Infestations around yards can be easily spotted and controlled whereas infestations can develop unnoticed in large paddocks.

Particular care should be taken when purchasing seed, hay and other fodder materials. Always keep a close watch on areas where hay has been fed out for the emergence of parthenium or other weeds.

Property hygiene is important. Owners of clean properties should ensure that visitors from infested areas do not drive through their properties. If your property has parthenium weed on it, ensure that it is not spread beyond the boundary or further within the property.

Pasture management

Grazing management is the most useful method of controlling large-scale parthenium weed infestations. Maintain pastures in good condition with high levels of ground and grass crown cover. This may require rehabilitation of poor pastures, followed by a sound grazing maintenance program.

Sown pasture establishment—Poor establishment of sown pastures can allow parthenium weed colonisation. pasture agronomist Aerial seeding prior to scrub pulling is normally beneficial.

Overgrazing—High grazing pressure caused by drought or high stock numbers decreases the vigour and competitiveness of pastures and allows the entry and spread of parthenium weed. Maintenance of correct stock numbers is most important in controlling parthenium weed. pasture agronomist

Pastures spelling—In situations of serious infestation, pasture spelling is essential for rehabilitation. Total spelling is much more effective than simply reducing the

stocking rate. However, overgrazing of the remainder of the property must be avoided.

The most appropriate time for pasture spelling is the spring–summer growing period, with the first 6–8 weeks being particularly important. If the condition of perennial grasses (native or sown) is low, spelling for the entire growing season may be required or introduced grasses may need to be re-sown. Herbicide treatment can hasten the rehabilitation process by removing a generation of parthenium seedlings and allowing grass seedlings to establish without competition. In the presence of parthenium weed, grass establishment is poor.

Grazing during winter should not increase the parthenium weed risk. Most tropical grasses are dormant and can tolerate moderate grazing during this period. However, parthenium weed may germinate and grow at this time.

Fencing—One of the main problems in controlling parthenium weed is the large paddock size and the variability of country within paddocks. The resulting uneven grazing pressures encourage parthenium weed to colonise the heavily grazed country. Ideally, similar land types should be fenced as single units. Fencing can be used to great effect to break up large paddocks, allowing more flexible management such as pasture spelling or herbicide application, options not available previously.

Burning—Burning is not promoted as a control strategy for parthenium weed. However, research suggests that burning for pasture management (e.g. woody weed control) should not result in an increased infestation if the pasture is allowed to recover prior to the resumption of grazing. Stocking of recently burnt areas known or suspected to contain parthenium decreases pasture competition and favours parthenium, ultimately creating a more serious infestation.

Herbicide control

Non-crop areas—Parthenium weed should be sprayed early before it can set seed. A close watch should be kept on treated areas for at least two years.

Small and/or isolated infestations should be treated immediately. Herbicide control will involve a knockdown herbicide to kill plants that are present and a residual herbicide to control future germinations. Repeated spraying may be required even within the one growing season to prevent further seed production.

Extensive infestations will require herbicide treatment in conjunction with pasture management. Timing of spraying is critical so that parthenium weed is removed when plants are small and before seeding has occurred. Grasses should be actively growing and seeding so that they can recolonise the infested area.

Table 1 shows the herbicides registered for parthenium weed control and application rates. Before using any herbicide always read the label carefully. All herbicides must be applied strictly in accordance with the directions on the label.

Cropping areas—Controlling parthenium weed in cropland requires selective herbicide use and/or crop rotations. For further information on parthenium weed control in crops consult your local biosecurity officer.

Biological control

The combined effects of biological control agents reduced the density and vigour of parthenium weed and increased grass production.

There are currently a number of insect species and two rust pathogens that have been introduced to control parthenium weed—a selection of these are outlined below.

Epiblema strenuana is a moth introduced from Mexico established in all parthenium weed areas. The moth's larvae feed inside the stem, forming galls that stunt the plant's growth, reduce competitiveness and seed production.

Listronotus setosipennis is a stem-boring weevil from Argentina but is of limited success in reducing parthenium weed infestations.

Zygogramma bicolorata is a defoliating beetle from Mexico which is highly effective where present. It emerges in late spring and is active until autumn.

Smicronyx lutulentus (Mexico) lays eggs in the flower buds where the larvae feed on the seed heads.

Conotrachelus albocinereus (stem-galling weevil from Argentina) produces small galls and is still becoming established in Queensland.

Bucculatrix parthenica (leaf mining moth from Mexico) larvae feed on leaves, leaving clear windows in the leaf.

Carmentia ithacae is a stem boring moth from Mexico which is becoming established at favourable sites in the northern Central Highlands.

Puccinia abrupta is a winter rust from Mexico that infects and damages leaves and stems. It is currently established over a wide area from Clermont south. It requires a night temperature of less than 16 degrees and 5–6 hours of leaf wetness (dew). Sporadic outbreaks occur where weather conditions are suitable.

Puccinia melampodii is a summer rust from Mexico that weakens the plant by damaging the leaves over the summer growing season. It is currently established and spreading at a number of sites from north of Charters Towers to Injune in the south.

Manual control

Hand pulling of small areas is not recommended. There is a health hazard from allergic reactions and a danger that mature seeds will drop off and increase the area of infestation.

Further information

Further information is available from your local government office, or by contacting Biosecurity Queensland (call 13 25 23 or visit our website at www.biosecurity.qld.gov.au).

Table 1 Herbicides registered for parthenium weed.

Herbicide	Rate	Situation	Comments
2,4-D amine 500 g/L	0.4 L/100 L	Land—industrial, pastures; rights-of-way	Spot spray
atrazine 500 g/L max 3 kg/ha/yr	3.6–6 L/ha	Fields and fallow	Boom spray
	6 L/ha	Land—industrial, commercial, non-agricultural, roadside, right-of-way	Boom spray
atrazine 900 g/kg max 3 kg/ha/yr	2–3.3 kg/ha	Fields and fallow	Boom spray
	3.3 kg/ha	Land—non-agricultural, commercial, industrial	Boom spray
2,4-D + picloram (Tordon 75-D)	125 ml/100 L	Land—commercial, industrial, pastures, right-of-way	Spot spray
	3 L/ha	Land—commercial, industrial, pastures, right-of-way	Boom spray
2,4-D ester ¹	.025 L/10 L	Land—non-agricultural, pastures	Rosette stage
glyphosate (450 g/L)	0.8–1.2 L/ha	Fields and fallow	Spot spray
metsulfuron methyl	5–7 g/ha	Fields and fallow	Seedlings only
	5 g/100 L	Land—commercial, industrial, pastures, rights-of-way	Spot spray
hexazinone	3.5 L/ha or 7 L/10 L/20 m ²	Land—commercial, industrial, pastures, rights-of-way	Boom spray or spot spray
dicamba (200 g/L) (500 g/L) (700 g/kg)	0.7–2.8 L/ha or 0.1–0.19 L/100L	Grass pastures	Boom spray or spot spray
	0.28–1.1 L/ha or 0.40–0.76 L/100L	Grass pastures	Boom spray or spot spray
	200–800 g/ha or 30–60 g/100 L	Grass pastures	Boom spray or spot spray

¹Use restricted in some areas of Central Queensland

Notes The registered rates are for non-crop uses. Consult label for in-crop recommendations.
For power hand spray or knapsack use, spray plants to the point of runoff.

Fact sheets are available from Department of Employment, Economic Development and Innovation (DEEDI) service centres and our Customer Service Centre (telephone 13 25 23). Check our website at www.biosecurity.qld.gov.au to ensure you have the latest version of this fact sheet. The control methods referred to in this fact sheet should be used in accordance with the restrictions (federal and state legislation, and local government laws) directly or indirectly related to each control method. These restrictions may prevent the use of one or more of the methods referred to, depending on individual circumstances. While every care is taken to ensure the accuracy of this information, DEEDI does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.

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CS0564

Appendix H AnaBat Analysis Results



Anabat echolocation data interpretation summary

Client: AARC (Dominique Taylor/Joel Stibbard)

Balance Job no.: AARC1111

Project name/location: Taraborah (30km west of Emerald) - 12-14/9/2011 & 28-30/9/2011

Data summary table

Numbers in columns refer to number of calls attributed to a species for a given night/site. Please note that these **numbers do not imply relative abundance** of the various species recorded. They may, however, be construed to represent relative differences in activity levels between the species.

Survey Date:	12-Sep	13-Sep	28-Sep	29-Sep
No. sequence files submitted:	2	181	674	980
Species positively identified				
<i>Chalinolobus gouldii</i>		74	8	79
<i>Chalinolobus morio</i>		1	18	2
<i>Chalinolobus picatus</i>		4	96	4
<i>Nyctophilus species</i>			2	1
<i>Scotorepens balstoni</i>			1	25
<i>Scotorepens greyii</i> or <i>S. sanborni</i>		7	137	131
<i>Vespadelus baverstocki</i>	1	3	34	31
<i>Miniopterus orianae oceanensis</i>		2		
<i>Chaerephon jobensis</i>		6	4	19
<i>Mormopterus beccarii</i>			3	17
<i>Saccolaimus flaviventris</i>			3	599
Calls NOT positively identified				
<i>C. gouldii</i> or <i>Mormopterus ridei</i>		80	20	46
<i>C. gouldii</i> or <i>S. balstoni</i>			2	9
<i>S. balstoni</i> or <i>M. ridei</i>			9	1
<i>Scotorepens</i> spp or <i>Chalinolobus nigrogriseus</i>		4	9	32
<i>V. baverstocki</i> or <i>M. o. oceanensis</i>			14	1
Unidentified calls		8	335	204

Species nomenclature:

Species names used in this summary follow Churchill (2008); except *Mormopterus eleryi* (after Reardon *et al.* 2008).

Call identification & reporting standard:

No bat call identification guide or key exists for the region from which these data were collected.

Call identification was based on published call descriptions for southern Qld (Reinhold *et al* 2001) and New South Wales (Pennay *et al.* 2004); and on reference calls collected from various locations in Queensland.

Determination of species' identification was further refined by considering probability of occurrence based on distributional information presented in Churchill (2008) and van Dyck & Strahan (2008).

The format and content of this report complies with nationally accepted standards for the interpretation and reporting of Anabat data (Reardon 2003); latest version available from the Australasian Bat Society on-line at <http://www.ausbats.org.au/>.

Anabat echolocation data interpretation summary

Client: AARC (Dominique Taylor/Joel Stibbard)

Balance Job no.: AARC1111

Project name/location: Taraborah (30km west of Emerald) - 12-14/9/2011 & 28-30/9/2011

Notes on species/calls not reliably identified:

Nyctophilus species

Nyctophilus species (long-eared bats) generally produce distinctive calls, but the species within the genus cannot be reliably differentiated from call data. At least two species may occur in the study area: *N. geoffroyi* and *N. gouldi*. It is also possible that the threatened species *N. corbeni* (= *N. timoriensis*) may be present in the area.

Scotorepens greyii and *S. sanborni*

These species' calls cannot be differentiated, and both may occur in the study area. Their calls also have similar pulse shape and frequency characteristics to those of *C. nigrogriseus*, *C. picatus* and *Mormopterus eleryi* (see discussion below).

Chalinolobus gouldii, *Scotorepens balstoni* and *Mormopterus ridei*

C. gouldii (Fc=28-34kHz) has steep and curved pulses that usually alternate in frequency by 2-3kHz.

S. balstoni produces pulses of similar shape that overlap in frequency (Fc=30-35kHz), but without alternation.

Both sometimes produce flatter, non-alternating pulses when cruising in open space.

Mormopterus ridei (Fc=28-34kHz) pulses are generally quite flat; however, curved pulses are also produced and these can be confused with the flatter pulse types of *C. gouldii* and *S. balstoni*.

Numerous calls were positively attributed to both *C. gouldii* and *S. balstoni*; however, none were definitely identifiable as *M. ridei*.

Numerous messy calls (multiple individuals and/or background noise) with steeper pulses could have been either *C. gouldii* or *S. balstoni*.

A number of brief and/or poorer quality recordings with flatter pulses around 30-32 could not be reliably differentiated between *C. gouldii* and *M. ridei*. Similarly, several calls around 34-35kHz could have been either *M. ridei* or *S. balstoni*.

Scotorepens spp or *Chalinolobus nigrogriseus*

Calls overlap in frequency (37-40kHz) and can be difficult to differentiate. Many calls were attributed to *Scotorepens* spp based on pulses with relatively short duration characteristic section and no tail or up-curved tail. A few calls, however, had more angular pulse shape with longer duration characteristic section. These could have been either *Scotorepens* spp or *C. nigrogriseus*.

V. baverstocki or *M. o. oceanensis*

These species have overlapping characteristic frequencies in the range 43-46kHz, but can usually be differentiated on pulse shape and duration (longer duration with flatter characteristic section in *M. o. oceanensis*). A couple of calls typical of *M. o. oceanensis* were identified for 13/9, but no clear evidence of this species was seen for other nights. Several calls on 28/9 & 29/9 had characteristic frequencies above 45kHz (at the limits of *V. baverstocki* range), but pulse shapes were variable and could have been from either species.

Unidentified calls

These calls were too weak and/or too brief to allow reliable identification. All were within frequency ranges of species/groups otherwise listed in the table and none are likely to represent additional species.

References:

Churchill, S. (2008). *Australian Bats*. Jacana Books, Allen & Unwin; Sydney.

Pennay, M., Law, B. and Reinhold, L. (2004). *Bat Calls of New South Wales*. Department of Environment and Conservation, Hurstville.

Reardon, T. (2003). Standards in bat detector based surveys. *Australasian Bat Society Newsletter* 20, 41-43.

Reardon, T., Adams, M., McKenzie, N. and Jenkins, P. (2008). A new species of Australian freetail bat *Mormopterus eleryi* sp. nov. (Chiroptera: Molossidae) and a taxonomic reappraisal of *M. norfolkensis* (Gray). *Zootaxa* 1875: 1-31.

Reinhold, L., Law, B., Ford, G. and Pennay, M. (2001). *Key to the bat calls of south-east Queensland and north-east New South Wales*. Department of Natural Resources and Mines, Brisbane.

van Dyck, S. and Strahan, R. (ed.) (2008). *The Mammals of Australia* (Third Edition); New Holland; Sydney.

Anabat Data Analysis Summary

Client: AARC (Dominique Taylor/Joel Stibbard)

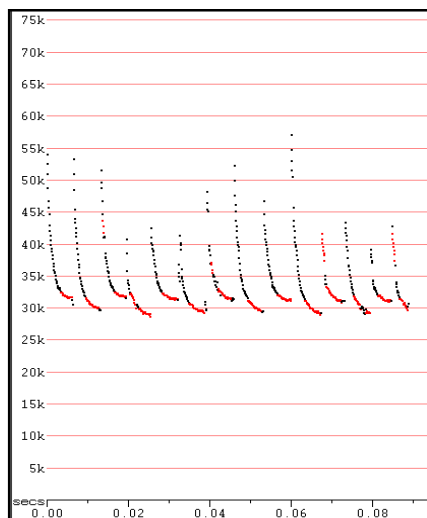
Balance Job no.: AARC1111

Project name/location: Taraborah (30km west of Emerald) - 12-13/9/2011 & 28-30/9/2011

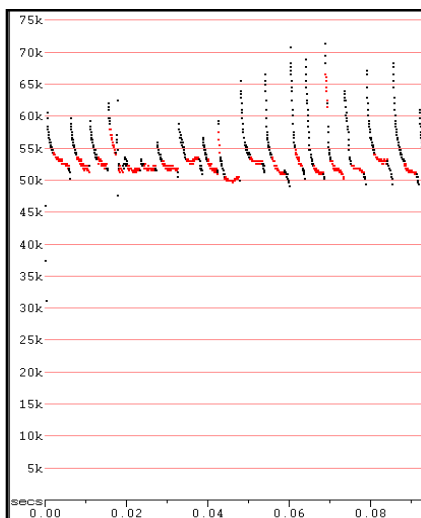
Sample calls extracted from the survey data.

Scale: 10 msec per tick; time between pulses removed
(AnalogW F7 compressed mode)

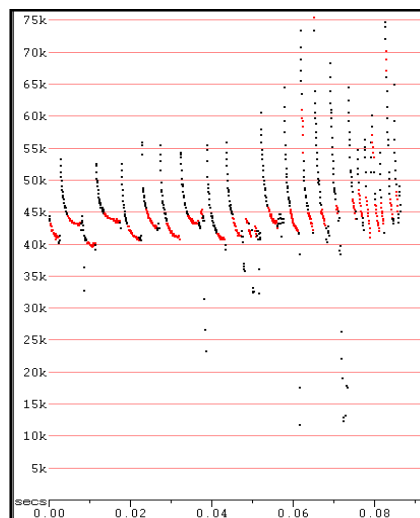
Species positively identified



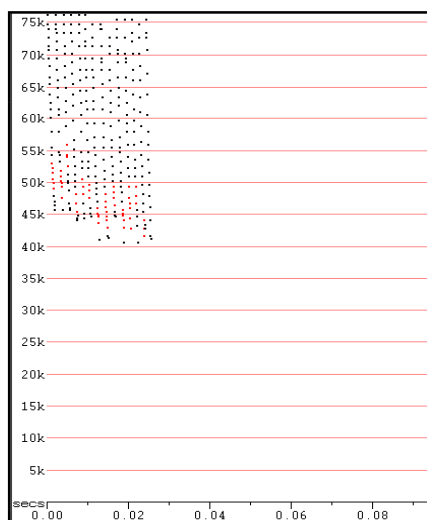
Chalinolobus gouldii



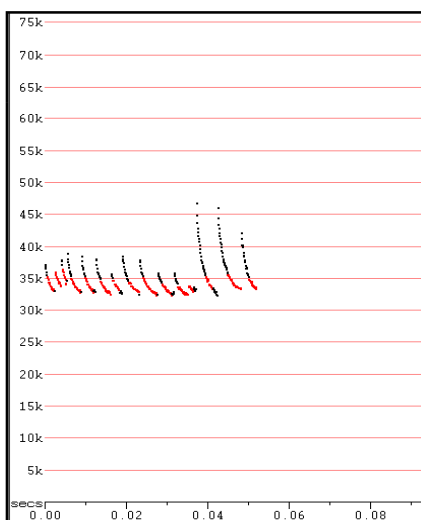
Chalinolobus morio



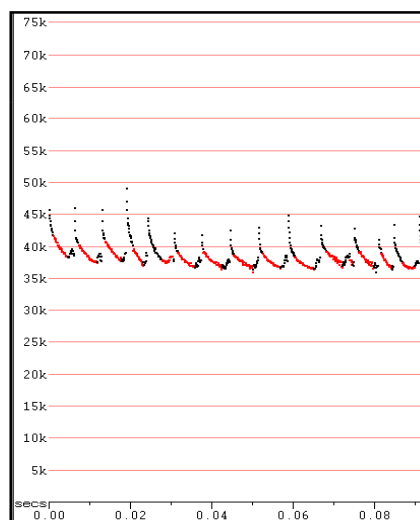
Chalinolobus picatus



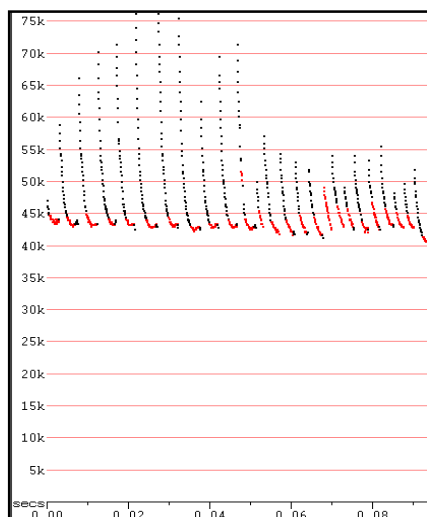
Nyctophilus species



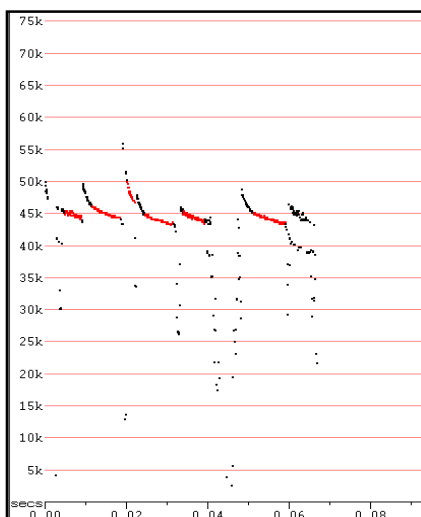
Scotorepens balstoni



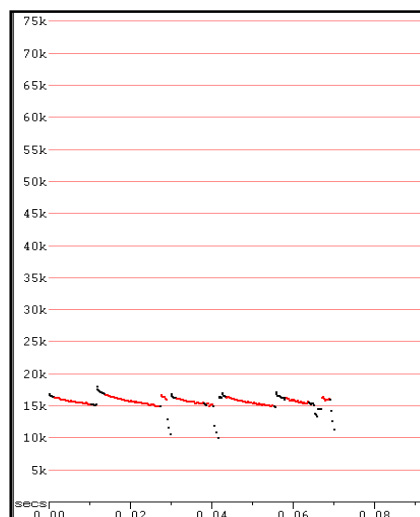
Scotorepens greyii / S. sanborni



Vespadelus baverstocki



Miniopterus orianae oceanensis



Chaerephon jobensis

Anabat Data Analysis Summary

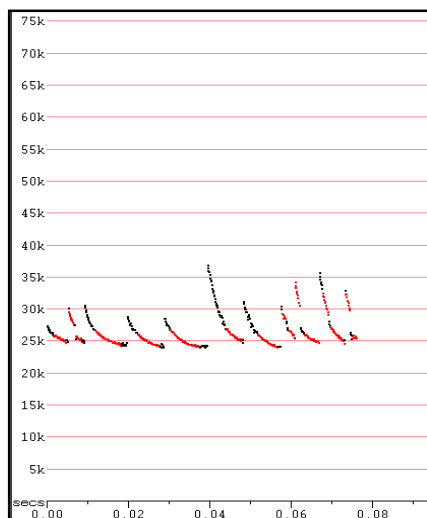
Client: AARC (Dominique Taylor/Joel Stibbard)

Balance Job no.: AARC1111

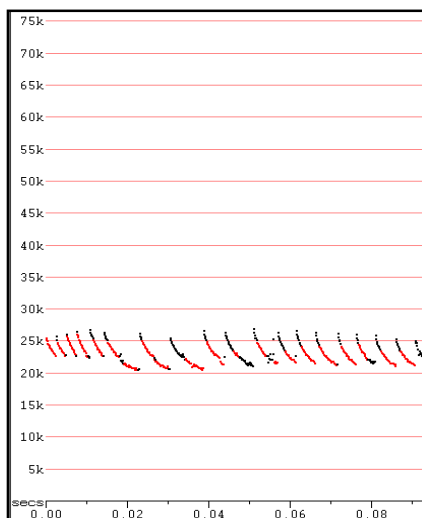
Project name/location: Taraborah (30km west of Emerald) - 12-13/9/2011 & 28-30/9/2011

Sample calls extracted from the survey data.

Scale: 10 msec per tick; time between pulses removed
(AnalogW F7 compressed mode)

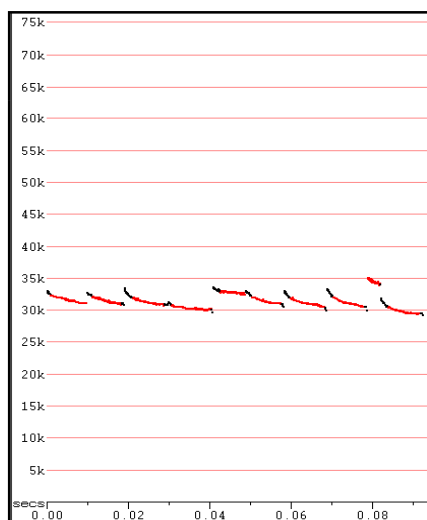


Mormopterus beccarii

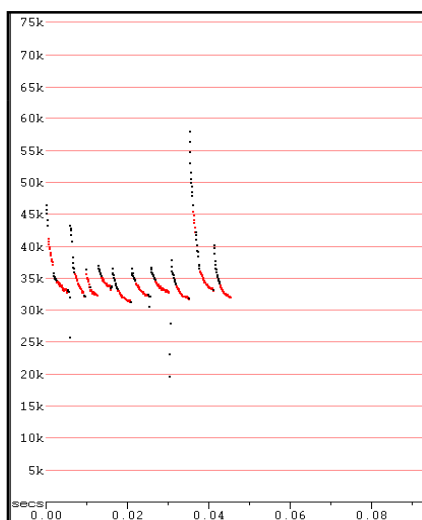


Saccolaimus flaviventris

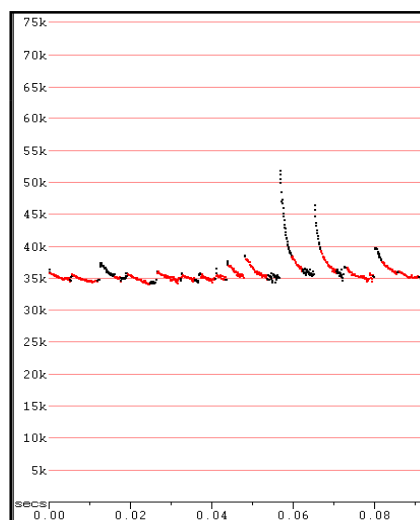
Calls NOT positively identified



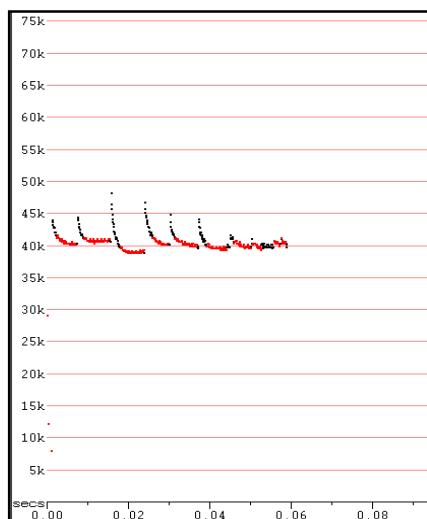
C. gouldii or *Mormopterus ridei*



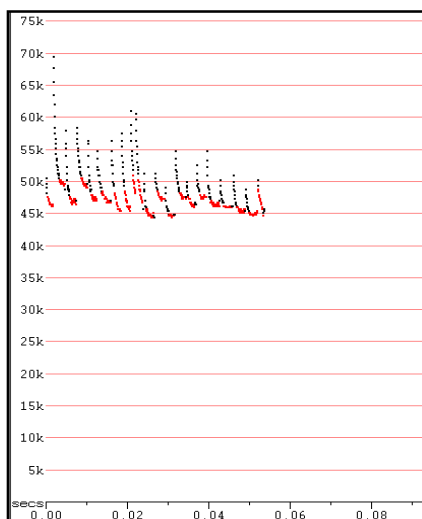
C. gouldii or *S. balstoni*



S. balstoni or *M. ridei*



Scotorepens spp or *C. nigrogriseus*



V. baverstocki or *M. o. oceanensis*



Microbat Call Interpretation Report

Prepared for ("Client"):	AustralAsian Resource Consultants
Survey location/project name:	Shenhuo Taraborah
Survey dates:	28 th February 2012
Client project reference:	
Job no.:	AARC1202
Report date:	1 May 2012

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Methods

Data receipt and processing

Bat calls were recorded using Anabat detectors (Titley Scientific, Brisbane). Some 3400 sequence files were submitted to Balance Environmental for analysis.

Information provided with the data indicates eight nights of bat detector survey (28th February to 6th March, 2012); however the data received for analysis contained only Anabat files recorded on the first night (28/2/12). Based on discussions with the client (AARC) about the missing data, it is assumed that detector failure resulted in no further bat call recordings for the remainder of the survey.

Time stamps recorded in the sequence files indicate that detection session on 28th February commenced around dusk and ceased at dawn the following morning.

Zero-crossing analysis

The Anabat sequence files were analysed using *AnalookW* (Corben 2009), with species identification achieved manually by viewing all calls and comparing them with reference calls collected from various locations in Queensland and/or with published call descriptions (Reinhold et al 2001; Pennay et al. 2004).

Determination of species' identity was refined by considering probability of occurrence based on distributional information presented in Churchill (2008) and van Dyck & Strahan (2008). Point records obtained from the WildNet database (DERM 2012) and/or Queensland Museum database (QM 2008) was also reviewed in an attempt to narrow down occurrence probabilities for some species.

Reporting standard

The format and content of this report follows Australasian Bat Society standards for the interpretation and reporting of bat call data (Reardon 2003), available on-line at <http://www.ausbats.org.au/>.

Species nomenclature follows Churchill (2008).

Results

Data quality and quantity

Despite the high detector trigger rate yielding more than 3000 Anabat sequence files over the night of 28th February, only 579 identifiable bat calls were found within the data set. The remaining sequence files contained only background noise and or very poor quality bat calls (weak, brief, fragmented) that were of no use for identification purposes.

Species recorded

At least eight species were recorded during this survey (see Table 1), with another two to three species possibly also recorded but not reliably identified because poor call quality precluded diagnostic resolution of inter-species call similarities (see Discussion section for further explanation).

Table 1. Microbat species recorded during the Shenhua Taraborah 2012 summer survey.

- ◆ = species positively identified from call data
- = species possibly present, but not reliably identified

Date:	28-Feb
No. sequence files:	3397
Total no. of calls:	579
No. of unidentifiable calls:	21
SPECIES	
<i>Chalinolobus gouldii</i>	◆
<i>Chalinolobus morio</i>	◆
<i>Chalinolobus picatus</i>	□
<i>Scotorepens balstoni</i>	◆
<i>Scotorepens greyii</i>	◆
<i>Vespadelus baverstocki</i>	□
<i>Vespadelus vulturnus</i>	□
<i>Mormopterus beccarii</i>	◆
<i>Mormopterus ridei</i>	◆
<i>Saccolaimus flaviventris</i>	◆
<i>Taphozous troughoni</i>	□

Discussion

Poor data quality in many sequence files hindered the call identification process. A number of factors may have contributed to the low recording quality, including (but not limited to): poor detector placement (e.g. too close to overhead foliage); low battery power; and poor atmospheric conditions (e.g. wind, rain, high humidity).

Most calls were of high enough quality (i.e. long duration sequences with clearly-defined pulse structure) to be reliably attributed to known species. Some calls, however, had mixed pulse characteristics and/or poorly-defined pulse structure. Such calls were attributable only to a species group based on characteristic frequency and known similarities in pulse structure (see below). Species shown as “possibly present” in Table 1 were identified only to group level; and all species within a group are shown as possible unless one or more calls were positively attributable to any of the group members.

Chalinolobus picatus/Scotorepens greyii/Vespadelus baverstocki (39-42 kHz)

These species are typified by a steep, broad-band FM sweep, terminating in a short, curved body, with upward-sweeping tail or no tail. *C. picatus* calls generally exhibit frequency alternation; whereas the other two species have uniform frequency across most pulses.

A few uniform calls around 38-39 kHz were reliably attributed to *S. greyii*, but most calls in the frequency range were of poor quality and/or had mixed pulse characteristics, with those at 39-40 kHz attributed to *C. picatus/S. greyii* and those above 41 kHz labelled as *C. picatus/V. baverstocki*.

Vespadelus baverstocki / V. vulturnus (43-47 kHz)

Calls from these two species have steep, broad-band FM sweep, terminating in a short, curved body, with upward-sweeping tail. They can sometimes be differentiated on frequency (*V. baverstocki* <43 kHz cf. *V. vulturnus* >46 kHz); however, the calls from this study were all around 45 kHz and could have been from either species.

Mormopterus beccarii / Taphozous troughtoni (23-25 kHz)

M. beccarii was positively identified from several calls with curved, non-uniform pulses around 24 kHz. Several calls at similar frequency had much flatter and more even pulses. It is likely that these were "cruise-phase" calls from *M. beccarii*, but *T. troughtoni* also produces flat-pulsed calls around this frequency. The likelihood of the latter species being present in the study area would be dependent on proximity to caves or similar roosting habitat.

References

- Churchill, S. (2008). *Australian Bats*. Jacana Books, Allen & Unwin; Sydney.
- Corben, C. (2009). *AnaLookW* Version 3.7w. Software for bat call analysis using ZCA data.
- DERM (2012). WildNet database extract: *Vespadelus baverstocki* & *Vespadelus vulturnus*. Department of Environment and Resource Management, Mackay. Extracted May 2012.
- QM (2008). Queensland Museum specimen register database extract: Vespertilionidae. Queensland Museum, South Bank, Brisbane. Extracted January 2008.
- Pennay, M., Law, B. and Reinhold, L. (2004). *Bat Calls of New South Wales*. Department of Environment and Conservation, Hurstville.
- Reardon, T. (2003). Standards in bat detector based surveys. *Australasian Bat Society Newsletter* **20**, 41-43.
- Reinhold, L., Law, B., Ford, G. and Pennay, M. (2001). *Key to the bat calls of south-east Queensland and north-east New South Wales*. Department of Natural Resources and Mines, Brisbane.
- van Dyck, S. and Strahan, R. (ed.) (2008). *The Mammals of Australia* (Third Edition). New Holland; Sydney.

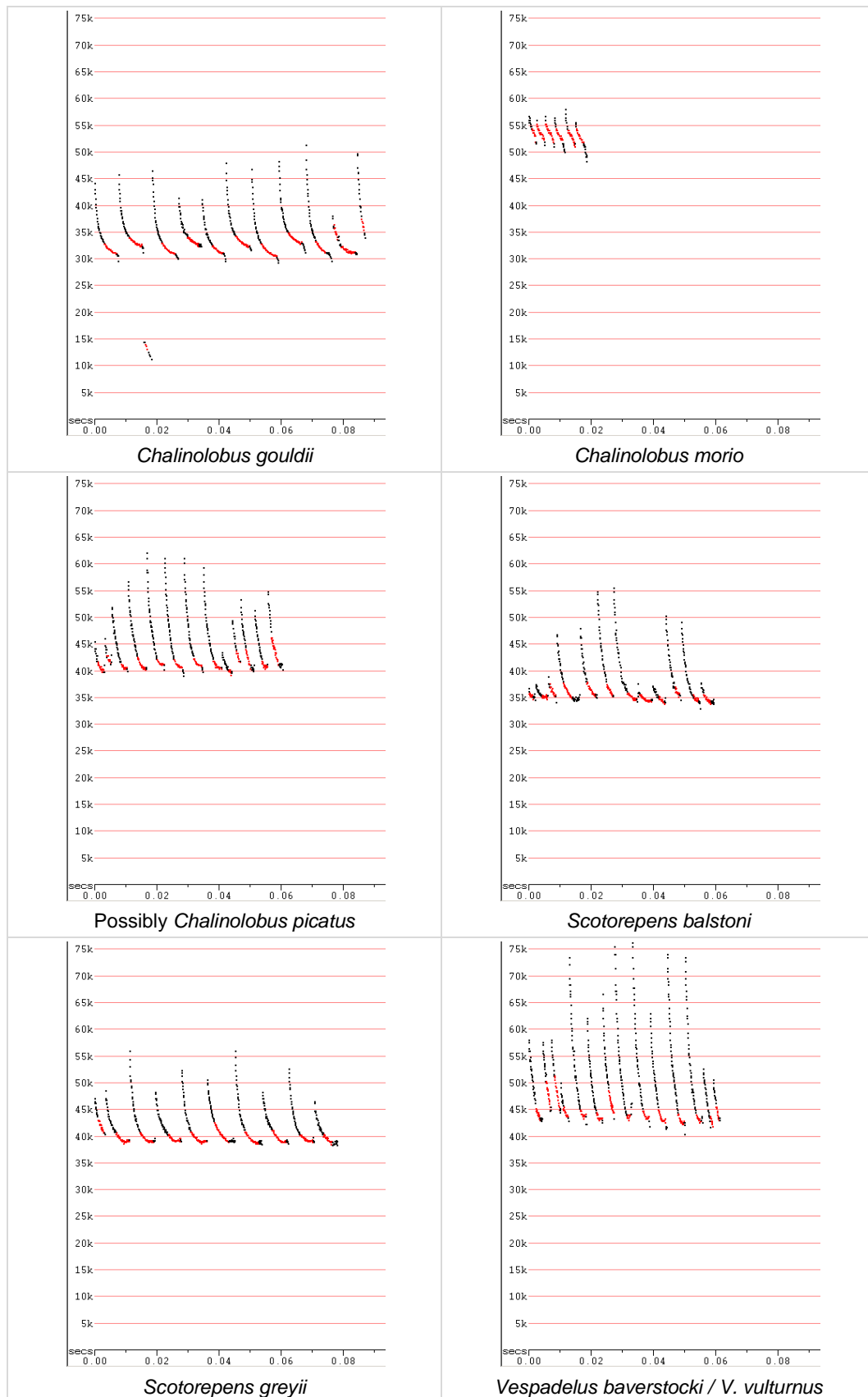


Figure 1 Representative call sequences from the Taraborah summer survey.
(Scale: 10msec per tick; time between pulses removed)

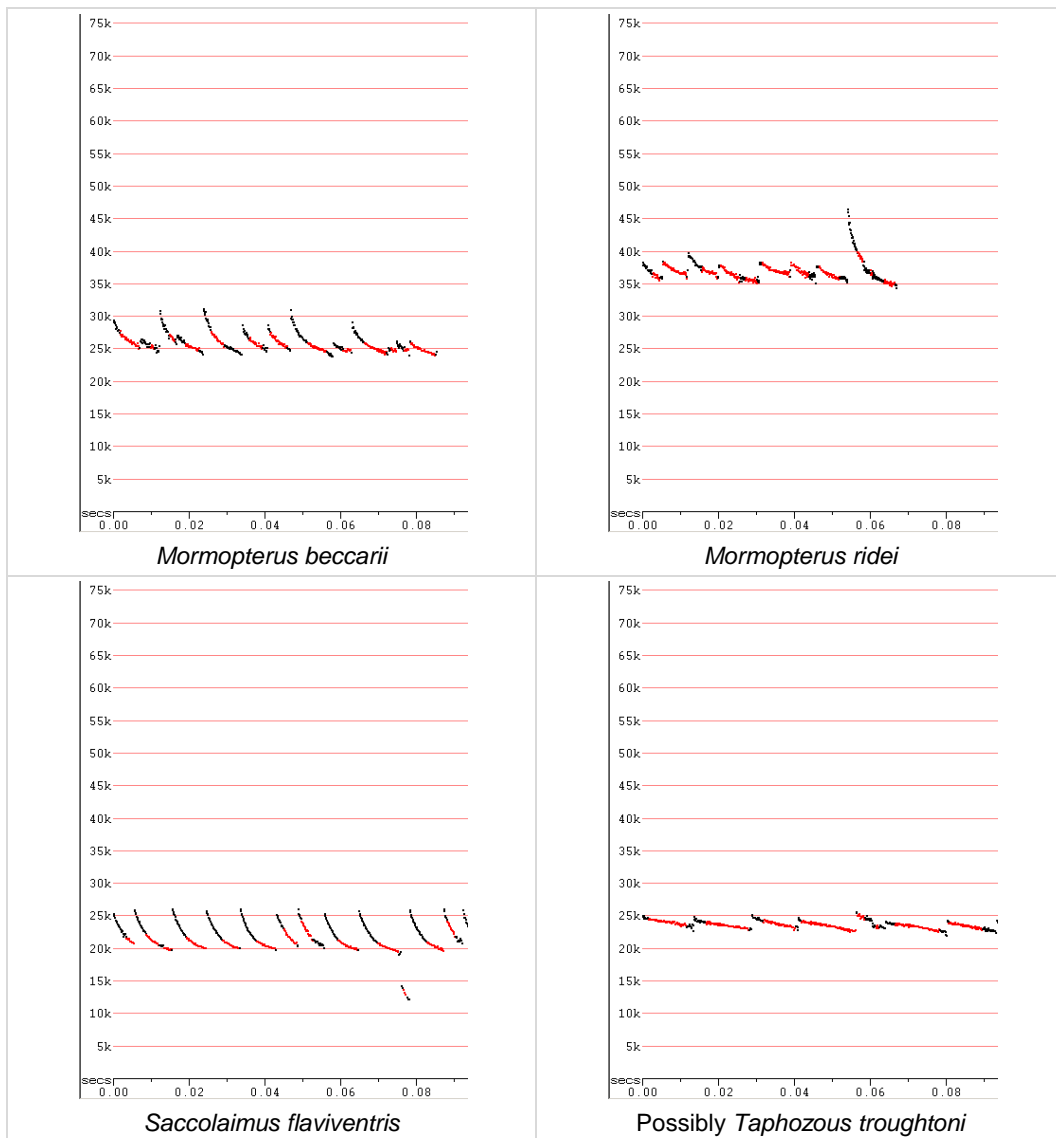


Figure 1 (cont.) Representative call sequences from the Taraborah summer survey.
(Scale: 10msec per tick; time between pulses removed)



Microbat Call Interpretation Report

Prepared for ("Client"):	AustralAsian Resource Consultants
Survey location/project name:	Shenhuo Taraborah
Survey dates:	7 th – 8 th August 2012
Client project reference:	
Job no.:	AARC1208
Report date:	14 August 2012

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Methods

Data receipt and processing

Bat calls were recorded using Anabat detectors (Titley Scientific, Brisbane). Survey data were downloaded from the Anabat CF cards using *CFCread* (Corben 2011) to produce Anabat sequence files (zero-crossing analysis format). Some 680 sequence files were submitted to Balance Environmental for analysis.

Field datasheets submitted with the data show two nights of detector survey - 7th and 8th August 2012; with three detectors deployed at separate sites on the 7th August and two detectors deployed simultaneously at a single site on the 8th August.

Time stamps recorded in the sequence files indicate that detection sessions commenced around dusk and ceased at dawn for all detector-nights.

Zero-crossing analysis

The Anabat sequence files were analysed using *AnalookW* (Corben 2009), with species identification achieved manually by viewing all calls and comparing them with reference calls collected from various locations in Queensland and/or with published call descriptions (Reinhold et al 2001; Pennay et al. 2004).

Determination of species' identity was refined by considering probability of occurrence based on distributional information presented in Churchill (2008) and van Dyck & Strahan (2008). Point records obtained from the WildNet database (DERM 2012) and/or Queensland Museum database (QM 2008) was also reviewed in an attempt to narrow down occurrence probabilities for some species.

Reporting standard

The format and content of this report follows Australasian Bat Society standards for the interpretation and reporting of bat call data (Reardon 2003), available on-line at <http://www.ausbats.org.au/>.

Species nomenclature follows Churchill (2008).

Results

Data quality and quantity

Data quality was variable, with many calls being brief and/or fragmented, resulting in low reliability of call diagnosis. The number of calls recorded over all nights was relatively low (mean calls per detector per night <150).

Species recorded

At least ten species were recorded during this survey (see Table 1), with another three to four species possibly also recorded but not reliably identified because poor call quality precluded diagnostic resolution of inter-species call similarities (see Discussion section for further explanation).

Table 1. Microbat species recorded during the Shenhua Taraborah 2012 winter survey.

- ◆ = species positively identified from call data
- = species possibly present, but not reliably identified
- = species not recorded at site

Date:	7-Aug	7-Aug	7-Aug	8-Aug	8-Aug
Detector:	Anabat 1	Anabat 2	Anabat 3	Anabat 5	Anabat 6
No. sequence files:	76	201	286	45	71
Total no. of calls:	67	192	301	42	70
No. of unidentifiable calls:	12	17	48	20	34
SPECIES					
<i>Chalinolobus gouldii</i>	◆	◆	◆	□	◆
<i>Chalinolobus morio</i>	□	-	◆	□	◆
<i>Chalinolobus picatus</i>	□	◆	◆	□	□
<i>Nyctophilus species</i>	◆	-	-	-	-
<i>Scotorepens balstoni</i>	-	□	□	-	-
<i>Scotorepens greyii</i>	◆	◆	◆	□	□
<i>Vespadelus baverstocki</i>	□	-	□	□	□
<i>Vespadelus troughtoni</i>	□	-	-	□	□
<i>Miniopterus orianae oceanensis</i>	◆	◆	◆	◆	-
<i>Austronomus australis</i>	◆	-	-	-	◆
<i>Chaerephon jobensis</i>	-	-	◆	□	□
<i>Mormopterus ridei</i>	◆	□	◆	□	◆
<i>Saccolaimus flaviventris</i>	-	◆	◆	◆	□

Discussion

The low number of calls recorded was probably due to survey timing rather than of a lack of bats in the survey area, since bat activity is inherently low during the winter months.

Poor data quality in many sequence files hindered the call identification process. A number of factors may have contributed to the low recording quality, including (but not limited to): poor detector placement (e.g. too close to overhead foliage); low battery power; and poor atmospheric conditions (e.g. wind, rain, high humidity).

Some calls were of high enough quality (i.e. long duration sequences with clearly-defined pulse structure) to be reliably attributed to known species. Many calls, however, had mixed pulse characteristics and/or poorly-defined pulse structure. Such calls were attributable only to a species group based on characteristic frequency and known similarities in pulse structure (see below). Species shown as “possibly present” in Table 1 were identified only to group level; and all species within a group are shown as possible unless one or more calls were positively attributable to any of the group members.

Chalinolobus gouldii/*Scotorepens balstoni*/*Mormopterus* species (29-33 kHz)

C. gouldii calls ($F_c=27-33$ kHz) generally have steep, high band-width, curved pulses with almost flat base, often with frequency alternating between pulses. *S. balstoni* ($F_c=30-35$ kHz) has similar pulse shapes but lack the frequency alternation. *Mormopterus ridei* calls are generally flat to gently-curved, with low band-width, usually at uniform frequency.

Some calls in the frequency range were reliably identified as *C. gouldii*, based on these characteristics; however, many had mixed pulse shapes and lacked clear evidence of frequency alternation. Most of these indeterminate calls were attributed to *C. gouldii*/*M. ridei*, but a few with steeper pulses could have been either *C. gouldii* or *S. balstoni*.

Chalinolobus morio/*Vespadelus troughtoni* (49-53 kHz)

A few calls had pulses with distinctive downward-sweeping tails and were positively identified as belonging to *C. morio*; however, most calls in the frequency range were of low quality and could not be reliably distinguished to either species.

Chalinolobus picatus/*Scotorepens greyii*/*Vespadelus baverstocki* (39-42 kHz)

These species are typified by a steep, broad-band FM sweep, terminating in a short, curved body, with upward-sweeping tail or no tail. *C. picatus* calls generally exhibit frequency alternation; whereas the other two species have uniform frequency across most pulses.

A few calls were reliably attributed to *C. picatus* based on frequency alternation; and a number of uniform calls around 38-39 kHz were attributed to *S. greyii*. The majority of calls in the frequency range were of poor quality and/or had mixed pulse characteristics, with those at 39-40 kHz attributed to *C. picatus*/*S. greyii* and those above 41 kHz labelled as *C. picatus*/*V. baverstocki*.

Nyctophilus species

These bats produce calls with steep, linear pulses that are generally easy to distinguish from other bat calls; however, the species in the genus cannot be differentiated. Two species probably occur in the study area: *N. geoffroyi* and *N. gouldii*.

Chaerephon jobensis/*Saccolaimus flaviventris* (15-20 kHz)

Calls with flat pulses and characteristic frequency <15 kHz were positively attributed to *C. jobensis* and those with uniform, curved pulses >17 kHz were identified to *S. flaviventris*. Many calls in the frequency range were very brief and/or had poorly defined pulse structure and could have been from either species.

References

- Churchill, S. (2008). *Australian Bats*. Jacana Books, Allen & Unwin; Sydney.
- Corben, C. (2009). *AnalookW* Version 3.7w. Software for bat call analysis using ZCA data.
- Corben, C. (2011). *CFCread Storage ZCAIM interface* Version 4.3s.
- DERM (2012). WildNet database extract: *Vespadelus baverstocki* & *Vespadelus vulturnus*. Department of Environment and Resource Management, Mackay. Extracted May 2012.
- QM (2008). Queensland Museum specimen register database extract: Vespertilionidae. Queensland Museum, South Bank, Brisbane. Extracted January 2008.
- Pennay, M., Law, B. and Reinhold, L. (2004). *Bat Calls of New South Wales*. Department of Environment and Conservation, Hurstville.
- Reardon, T. (2003). Standards in bat detector based surveys. *Australasian Bat Society Newsletter* **20**, 41-43.
- Reinhold, L., Law, B., Ford, G. and Pennay, M. (2001). *Key to the bat calls of south-east Queensland and north-east New South Wales*. Department of Natural Resources and Mines, Brisbane.
- van Dyck, S. and Strahan, R. (ed.) (2008). *The Mammals of Australia* (Third Edition). New Holland; Sydney.

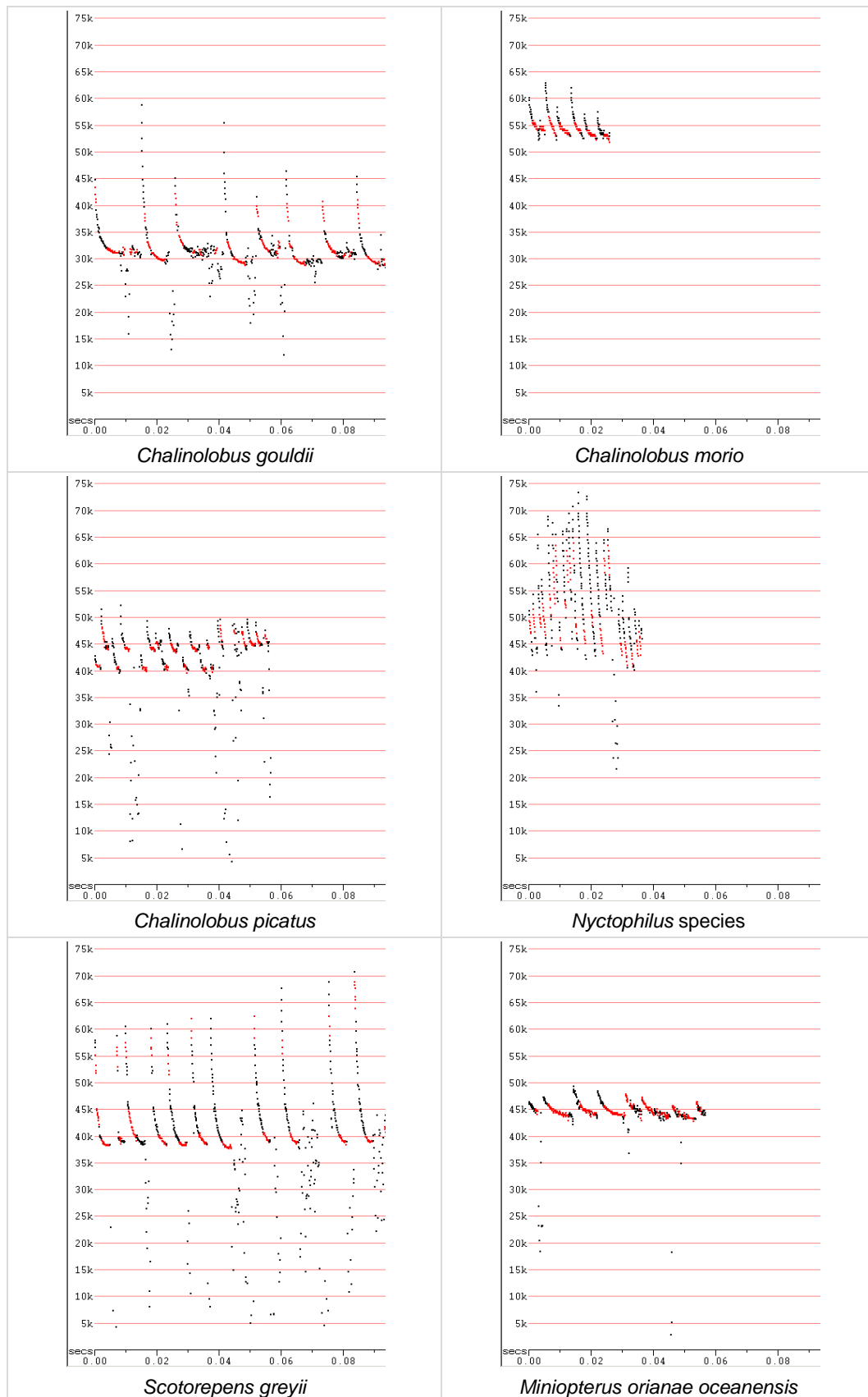


Figure 1 Representative call sequences from species recorded in the Taraborah winter survey. (Scale: 10msec per tick; time between pulses removed)

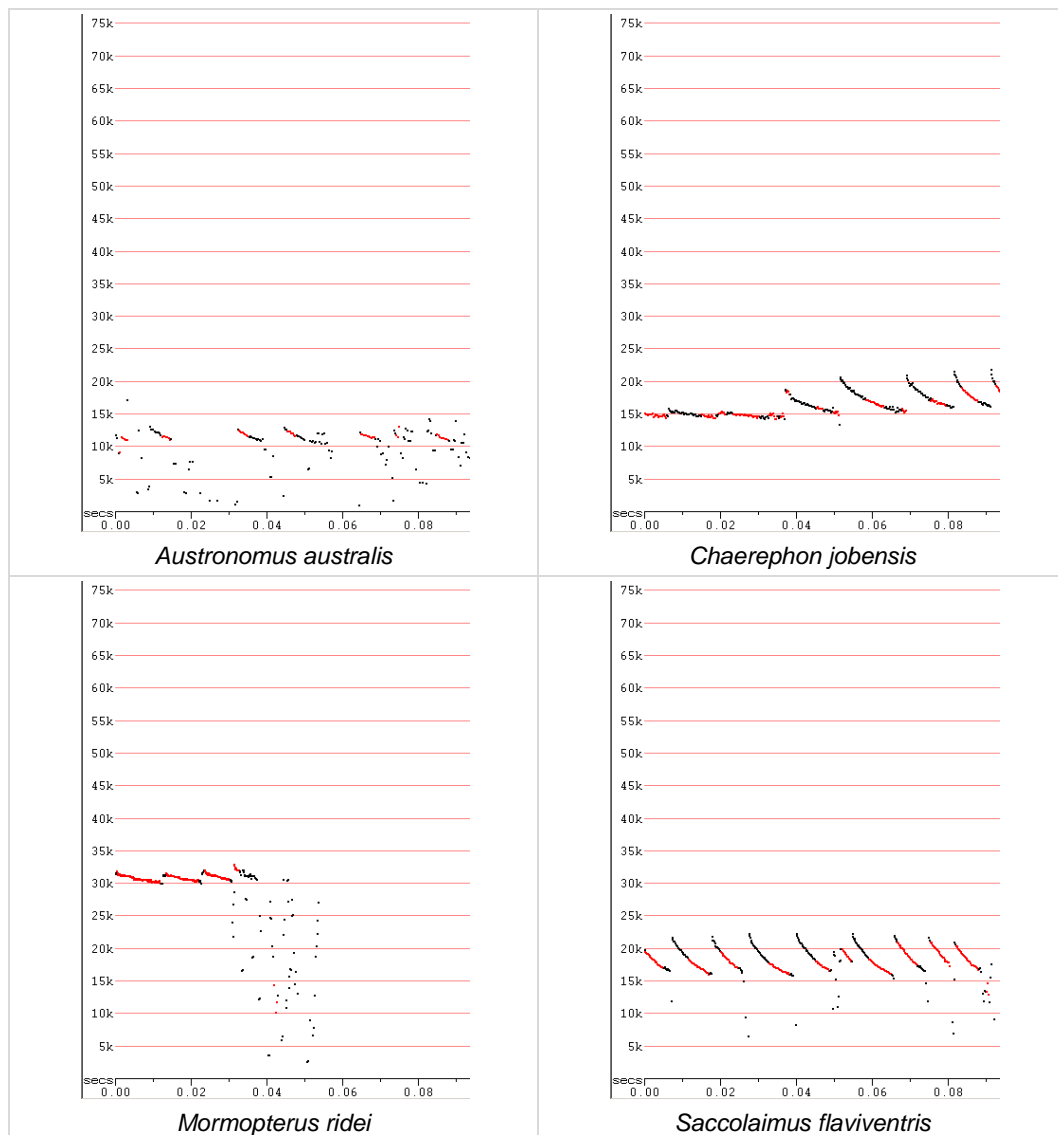


Figure 1 (cont.) Representative call sequences from species recorded in the Taraborah winter survey.
(Scale: 10msec per tick; time between pulses removed)