SUSTAINABILITY
FUTURE GROWTH

VALE EXPLORATION PTY LTD

TENNANT CREEK PROJECT FLORA AND FAUNA DESKTOP STUDY REPORT

Tenements: EL27580, EL27712 & EL27992

June 2011

Rev 0

Revision	Author	Review	Approval	Date
Rev A Draft for internal review	Susanna Durack	Gay Bradley	John Miragliotta	26 May 2011
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SUSTAINABILITY
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1. INTRODUCTION

In May 2011, Sustainability Pty Ltd (Sustainability) was engaged by Vale Exploration Pty Ltd (Vale) to perform a flora and fauna desktop study of the Tennant Creek Project site (Tenements: EL27580, EL27712 and EL27992), in the Northern Territory (NT) (Figure 1). The purpose of the survey was to identify any species of conservation significance likely to be present in the project area to ensure that proposed exploration operations comply with relevant environmental legislation of the NT and subsequently minimise adverse impacts to the environment.

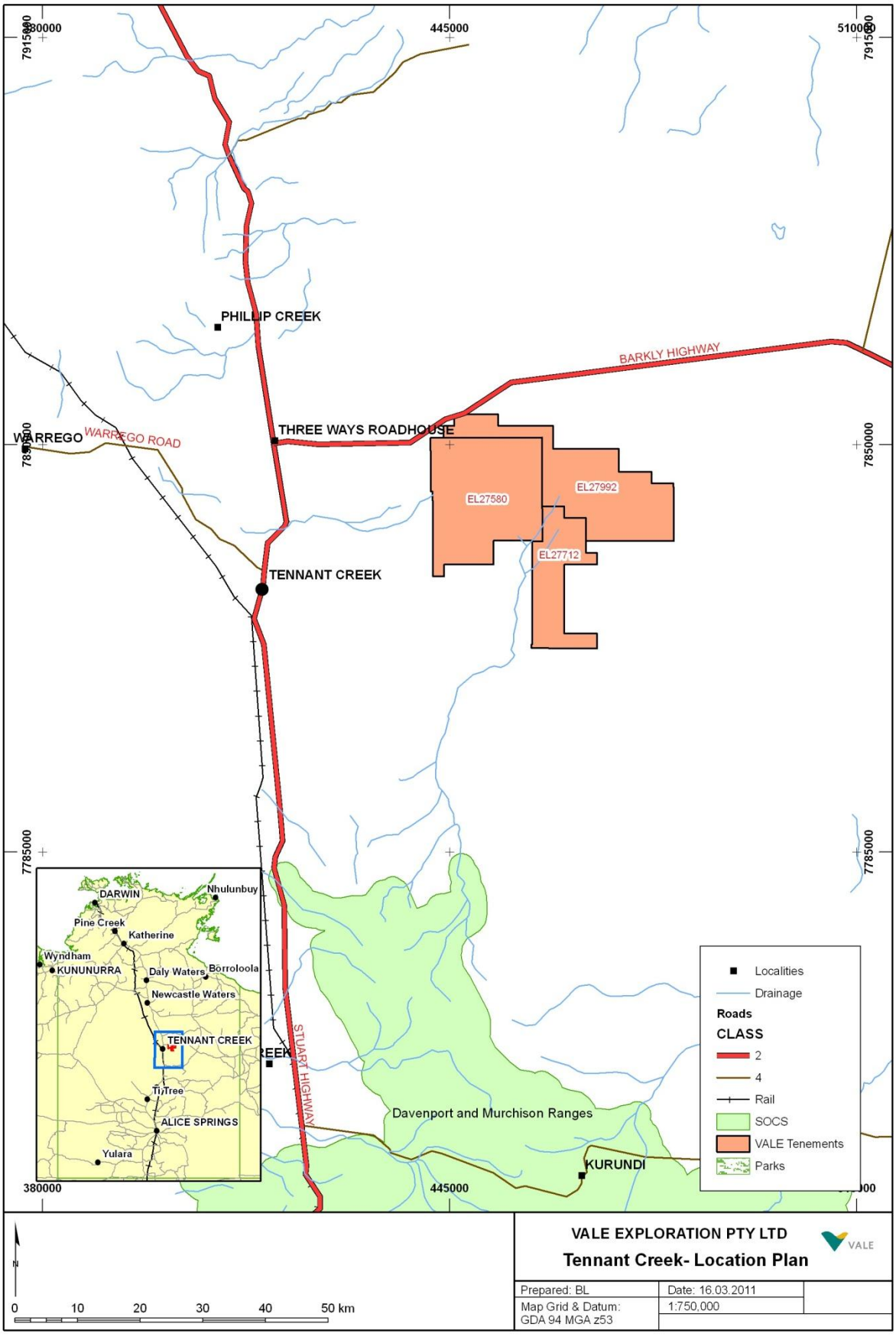

Figure 1: Tennant Creek Project Location

2. METHODOLOGY

The desktop flora and fauna assessment was conducted in three stages. The first stage consisted of a search of species listed under the Federal government database using the "Protected Matters Search Tool". This information provides general guidance on matters of national environmental significance and other matters protected by the *Environmental Protection and Biodiversity Conservation Act 1999* (*EPBC Act*). The Protected Matters Search Tool is managed by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) and is publically available online (DSEWPC, 2011).

The *EPBC Act* Protected Matters site requires the submission of geographical co-ordinates in the form of a polygon, to define an area of interest, to generate an EPBC Act Protected Matters flora and fauna species report. The entire Tennant Creek Project area was included in the *EPBC Act* database search, which was an area of 76,880 hectares, plus a one kilometre "buffer" around the border of each of the three tenements. A buffer between one and 10 kilometres must be selected in the search process. The minimum buffer size was chosen for the *EPBC Act* database search, because Vale will not be operating outside of the Exploration Tenements.

The geographical co-ordinates of each tenement can be found by first registering with, then accessing, the Northern Territory's Titles Information System (TIS) (TIS, 2011). By entering in each tenement title, a map of the tenement and surrounding titles is produced, and geographical location points and other information regarding the tenement can also be viewed. By clicking on any point related to the tenement location, geographical co-ordinates can be produced. In this study, the corner point locations of the tenement boundary were required (which formed a co-ordinate polygon) for the *EPBC Act* data search and similarly for the second stage of the methodology – searching the Northern Territory Government (NTG) flora and fauna database.

The NTG flora and fauna database is managed by the Northern Territory's Department of Natural Resources, Environment, The Arts and Sport (NRETAS). A request for data relating to a specific area in the Northern Territory can be made online with NRETAS (NRETAS, 2011a). The data request requires a form to be downloaded from the website and two geographic locations of the site are to be submitted for each tenement of interest: the top left and bottom right co-ordinates, allowing the mapping tool to create a rectangular or square search area. These co-ordinates can be found using the TIS website. As the tenements are usually irregularly shaped, the rectangular/square area generally encompasses a greater area than just the tenements of interest for the flora and fauna search. The data request usually takes several days to return the digital data files which must then be collated and analysed to determine several factors, such as which tenement each species is located on and the conservation status of species likely to be present.

Geographic Information Systems (GIS) specialists (CAD Resources) were engaged to assist in differentiating the tenement locations of the species within each tenement utilising specialist mapping programs.

The third stage of the flora and fauna desktop study involved researching various online resources to assist with describing the current conditions at the project site. This included:

- The Bureau of Meteorology for climatic data (BOM, 2011); and
- NRETAS resource documents that accompany the Northern Territory Parks and Conservation Masterplan, primarily the Bioregions Assessment of Key Biodiversity Values and Threats document (Baker *et al.,* 2005).

3. DESKTOP STUDY FINDINGS

3.1 CURRENT TENNANT CREEK PROJECT CONDITIONS

3.1.1 Landscape and Geology

The Tennant Creek Project covers Cambrian sediments of the Georgina basin. The project occurs within the Davenport Murchison Ranges (DMR) bioregion, which is described as the following:

DMR: Comprises low but rugged rocky hills formed from folded volcanics, sandstone, siltstone and conglomerates. Soils are generally shallow lithosols, but fine grained alluvial soils occur in the valleys and surrounding plains. Vegetation includes hummock grasslands and low open woodlands dominated by eucalypt and Acacia species (Baker *et al.*, 2005).

3.1.2 Climate and Hydrology

The Tennant Creek Project is semi-arid with annual rainfall of 452.9mm. The climate is characterized by distinct wet and dry seasons with the majority of rain falling between November and March. The predominant wind direction is from the east. Drainage in the project is dominated by the Gosse River which transects the project in a NE / SW direction (BOM, 2011).

Table 1: Climate Statistics – Tennant Creek Airport[1]

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean Max Temp ºC	36.7	35.7	34.4	31.7	27.6	24.5	24.6	27.5	31.6	34.7	36.4	37.2
Highest Temp ºC	44.0	44.5	40.7	38.4	36.4	33.6	34.7	35.7	38.9	41.6	43.4	45.4
Mean days ≥ 40 ºC	5.9	2.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.8	3.5	6.1
Mean Minimum Temp ºC	24.9	24.5	23.2	20.4	16.4	12.9	12.3	14.5	18.4	21.7	23.8	24.9
Lowest Temp ºC	17.2	17.2	14.6	11.6	6.7	5.3	4.5	6.0	7.4	11.6	10.7	15.7
Mean Rainfall (mm)	114.1	122.4	53.3	16.2	8.6	5.3	5.1	1.6	8.0	19.9	38.5	68.2

[1] All rainfall and temperature measurements from 1969 – 2010 (data from 41 years) (BOM, 2011).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean number of days of rain >1mm	10.0	9.2	5.9	1.9	1.6	0.8	0.7	0.7	1.9	3.9	5.7	7.5

Key: Red = Maximum value; Blue = Minimum value.

3.2 FLORA AND VEGETATION

The flora and vegetation desktop surveys were focused on the areas outlined in Figure 2. The results of the survey are summarised below.

3.2.1 Vegetation of Tennant Creek Project Area

On a regional scale, the project occurs within the DMR, bioregion which is described in Section 3.1.1.

The dominant vegetation community within the project area is *Corymbia* low open woodland. Small areas of Eucalypt low open woodland also occur within the project (see Figure 2) (Baker *et al*., 2005).

Tennant Creek Project tenements have been covered by regional vegetation mapping, but there has been limited flora sampling within the Tennant Creek Project area. *EPBC Act* Protected Matters searches have showed that no threatened ecological communities (TECs) (under the *EPBC Act*) occur within the tenements. A NRETAS database search revealed no endangered flora species are likely to occur on the site.

3.2.2 NRETAS Flora Database Search Results

A search of the NRETAS database found that there were no plant species of significant conservation status, pursuant to the *Territory Parks and Wildlife Conservation Act 2009* as listed by the NTG, found within the Tennant Creek Project area during the 2011 desktop survey.

Only one plant species has been recorded within the Tennant Creek Project Area in the NRETAS database, which was *Fimbristylis simulans* of the Cyperaceae family, recorded in 1993 on tenement EL27580. This plant is classified as being of Least Concern (NRETAS, 2011a).

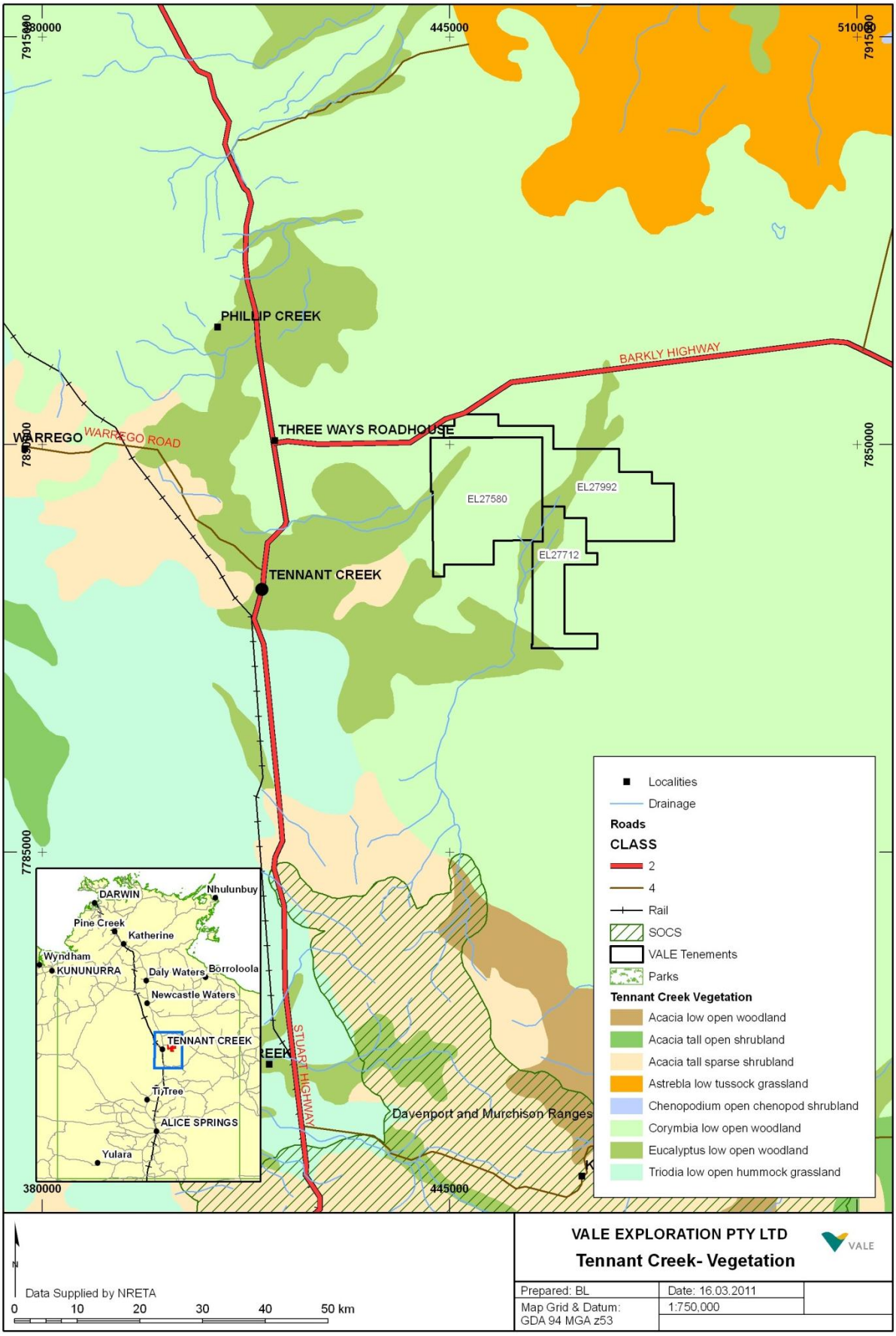

Figure 2: Tennant Creek Project Vegetation Type

3.2.3 *EPBC Act* Flora Database Search Results

The *EPBC Act* identifies 20 flora species as invasive species of national significance that pose a threat to biodiversity. The *EPBC Act* database search recorded two of those 20 invasive species, and these are presented in Table 2. The profiles of these two species are outlined in Appendix C. No other matters relevant to the *EPBC Act* were reported.

Table 2: Invasive Flora Species of National Significance

Species	Common Name (s)	Status	Tenement
Cenchrus cilias	Buffel-grass, Black Buffel-grass	Invasive	EL27580, EL27992, EL27712.
Parkinsonia aculeata	Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean	Invasive	EL27580.

3.2.4 Flora Data Discussion

There was only one species of recorded in the NRETAS database search, which was *Fimbristylis simulans* of the Cyperaceae family. This species is classified by NRETAS as being of Least Concern (NRETAS, 2011a). Since *Fimbristylis simulans* was the only plant recorded in the area, and the record is 18 years old, further field studies would be required to provide an update of what flora species are present in the Tennant Creek Project area.

3.3 FAUNA

A NRETAS database search and an *EPBC Act* Protected Matters search was also conducted for the fauna species at Tennant Creek Project. The search results are discussed at the end of this section.

3.3.1 NRETAS Fauna Database Search Results

The NRETAS database search returned six reported fauna records within the Tennant Creek Project tenements, none of which were classified as being of conservation significance pursuant to the *Territory Parks and Wildlife Conservation Act 2009* as listed by the NTG. These species are all classified as Least Concern, which are not of high conservation significance, but the data may be useful for site management requirements and comparison with future fauna survey reports to assist in determination of population trends, and environmental impact of exploration, if any.

It should be noted however, that there has not been an extensive or recent field study to contribute to this database. For example, only one of the three Tennant Creek Project tenements had been surveyed, and all surveys were some time ago (1980 and 1981), so further field studies to determine the current fauna information is recommended. Table 3 presents the categorised species reported in the NRETAS database search. The definitions of the NRETAS categories are presented in Appendix B.

Table 3: Summary of Fauna Species Recorded in NRETAS Database

Common Name	Scientific Name	NTG Conservation Status	Tenement sighted on	Number of Sightings	Date of Sighting
Black-faced Woodswallow	*Artamus cinereus*	Least Concern	EL27992	1	30/07/1981
Brown Falcon	*Falco berigora*	Least Concern	EL27992	1	30/07/1981
Nankeen Kestrel	*Falco cenchroides*	Least Concern	EL27992	1	30/07/1981
Black Falcon	*Falco subniger*	Least Concern	EL27992	1	30/07/1981
Zebra Finch	*Taeniopygia guttata*	Least Concern	EL27992	1	30/07/1981
Sand Goanna	*Vanarus gouldii*	Least Concern	EL27992	1	29/02/1980

3.3.2 *EPBC Act* Fauna Database Search Results

The Protected Matters search tool returned several fauna "species or species habitat that may occur within the area". These species are presented in the following tables and the *EPBC Act* Protected Matters Reports are included in Appendix A.

Table 4: Birds recorded in *EPBC Act* Search

Common Name	Scientific Name	Status	Tenements	Type of Presence
Australian Painted Snipe	*Rostratula australis*	Vulnerable	EL27580, EL27712, EL27992.	Species or species habitat may occur within the area

Table 5: Mammals recorded in *EPBC Act* Search

Common Name	Scientific Name	Status	Tenements	Type of Presence
Greater Bilby	*Macrotis lagotis*	Vulnerable	EL27580, EL27712, EL27992.	Species or species habitat likely to occur within the area

Table 6: Introduced Mammal Species recorded in *EPBC Act* Search

Common Name	Scientific Name	Status	Tenements	Type of Presence
Cat, House Cat, Domestic Cat	*Felis catus*	Invasive	EL27580, EL27712, EL27992.	Species or species habitat likely to occur within the area
Rabbit, European Rabbit	*Oryctolagus cuniculus*	Invasive	EL27580, EL27712, EL27992.	Species or species habitat likely to occur within the area
Red Fox, Fox	*Vulpes vulpes*	Invasive	EL27580, EL27712, EL27992.	Species or species habitat likely to occur within the area

There are also several listed Migratory and Marine Species that are potentially in the project area, according to the *EPBC Act* Protected Matters reports (Appendix A). These species may also occur within the tenements, but birds listed as migratory or marine are most likely to be located the vicinity of Lake Tarrabool or within Lake Sylvester and Corella Lake further north (NRETAS, 2011d).

Table 7: Marine and Migratory Bird Species recorded in *EPBC Act* Search

Terrestrial / Marine / Wetland	Common Name	Species Name	Tenement	Status	Type of Presence
Migratory Terrestrial Species	Rainbow Bee-eater	*Merops ornatus*	EL27580, EL27712, EL27992.	Listed overfly Marine area; Migratory: JAMBA.	Species or species habitat may occur within the area
Migratory Wetland & Marine Species	Great Egret, White Egret	*Ardea alba* (CAMBA & JAMBA as *Egretta alba)*	EL27580, EL27712, EL27992.	Listed overfly Marine area; Migratory: CAMBA, JAMBA.	Species or species habitat may occur within the area
Migratory Wetland & Marine Species	Cattle Egret	*Ardea ibis* (CAMBA as *Ardeola ibis,* JAMBA as *Bubulcus ibis)*	EL27580, EL27712, EL27992.	Listed overfly Marine area, Migratory: CAMBA, JAMBA.	Species or species habitat may occur within the area
Migratory Wetland Species	Oriental Plover, Oriental Dotterel	*Charadrius veredus*	EL27580, EL27712, EL27992.	Listed overfly Marine area, Migratory: BONN, JAMBA, ROKAMBA.	Species or species habitat may occur within the area
Migratory Wetland Species	Oriental Pratincole	*Glareola maldivarum*	EL27580, EL27712, EL27992.	Listed overfly Marine area, Migratory: CAMBA, JAMBA, ROKAMBA.	Species or species habitat may occur within the area
Migratory Wetland Species	Painted Snipe	*Rostratula australis / Rostratula benghalensis sp. lat.*	EL27580, EL27712, EL27992.	Listed overfly Marine area, Migratory: CAMBA.	Species or species habitat may occur within the area

Terrestrial / Marine / Wetland	Common Name	Species Name	Tenement	Status	Type of Presence
Migratory Marine Birds	Fork-tailed Swift	*Apus pacificus*	EL27580, EL27712, EL27992.	Listed overfly Marine area, Migratory: CAMBA, JAMBA, ROKAMBA.	Species or species habitat may occur within the area

3.3.3 Fauna Data Discussion

The NRETAS search returned six reported fauna sightings, which were all classified as Least Concern, under the *Territory Parks and Wildlife Conservation Act 2009*. The *EPBC Act* database search reported two species classified as Vulnerable under the *EPBC Act* (Australian Government, 2011) that may occur in the Tennant Creek area. These were the Australian Painted Snipe (*Rostulata australis*) and the Greater Bilby (*Macrotis lagotis*). The profiles of these two Threatened Fauna species are included in Appendix D. As these species or species habitat is only "likely to occur in the area", there is not a geographical co-ordinate to present on a map. Also, because there is only species of Least Concern recorded in the area (NRETAS, 2011a), there was no need to produce a map presenting the fauna for Tennant Creek Project.

Greater Bilbies are also classified as Vulnerable under the *Territory Parks and Wildlife Conservation Act 2009*. The preferred habitat of the Greater Bilby is characterised by sandy soils and hummock grasslands covered by spinifex (*Triodia*). An overstorey of low, shrub cover dominated by *Acacia* and *Melaleuca* is also often present. As this habitat does not occur in the project area, further field study would determine the actual presence of the Greater Bilby (NRETAS, 2011b).

The other conservation significant species reported to possibly occur in the Tennant Creek Project area, according to the *EPBC Act* database search, is the Australian Painted Snipe (*Rostratula australis*), which is classed as Vulnerable under the *EPBC Act* and by the NRETAS classification. It is likely that the Australian Painted Snipe uses the nearby Lake Sylvester System and Tarrabool lakes as breeding grounds, according to records. However, there are no NRETAS database sightings at the Tennant Creek Project tenements (NRETAS, 2011c).

Tarrabool Lake, which in exceptionally wet years enters the tenement area, is recognized as a Site of Conservation Significance by the NT Government as it supports internationally significant numbers of two significant waterbird species; the Australian Pelican (*Pelecanus conspicillatus*) and the Straw-necked Ibis (*Threskiornis spinicollis*) and one shorebird; the Black-winged Stilt (*Himantopus himantopus*) (Jaensch and Bellchambers 1997 as cited by

NRETAS, 2011d). Major waterbird breeding events typically occur after flooding, then receding waters provide habitat for migratory shorebirds. The birds listed as migratory or marine are most likely to be located the vicinity of Lake Tarrabool or within Lake Sylvester and Lake Corella further north (NRETAS, 2011d).

4. DISCUSSION

This report indicates that the exploration activities of the Tennant Creek Project are unlikely to have an impact upon any species of flora and fauna of conservation significance in the area. If exploration activity in the field intensifies, it is suggested that further field surveys at the project site would assist in the verification of the desktop surveys, and update the limited data.

The *EPBC Act* data shows only the *likelihood* of presence of a species; and the NRETAS data is limited in that the most only one flora species has been recorded in the Tennant Creek Project area and only six fauna species, which were all classified as Least Concern.

Planning for exploration should consider the fact that several weed species of concern have adapted to the area and appropriate weed management should be implemented to limit the further spread of weeds, such as Buffel Grass. A continuation of the Vale Exploration Weed Management Strategy that includes wash down of vehicles entering and leaving the project area, monitoring the access tracks and work areas at the start of, and at the end of, each wet season and spraying of any new weeds infestations with herbicide would be beneficial. A weed identification pamphlet produced from the information contained in Appendix C would be useful for onsite operators.

5. REFERENCES

Australian Government, (2011)
http://www.environment.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl?wanted=fauna#other_animals_vulnerable

BOM, (2011)
http://www.bom.gov.au/climate/averages/tables/cw_015135_All.shtml

Baker, B., Price, O., Woinarski, J., Gold, S., Connors, G., Fisher, A., Hempel, C. (2005) *Northern Territory Bioregions Assessment of Key Biodiversity Values and Threats. Department of Natural Resources, Environment and the Arts.*

DSEWPC, (2011)
http://www.environment.gov.au/arcgis-framework/apps/pmst/pmst-coordinate.jsf

NRETAS, (2011a)
http://www.nt.gov.au/nreta/wildlife/animals/requests.html

NRETAS, (2011b)
http://www.nt.gov.au/nreta/wildlife/animals/threatened/specieslist.html
http://www.nt.gov.au/nreta/wildlife/animals/threatened/pdf/mammals/greater_bilby_vu.pdf

NRETAS, (2011c)
http://www.nt.gov.au/nreta/wildlife/animals/threatened/pdf/birds/paintedsnipe_vu.pdf

NRETAS, (2011d), *Northern Territory Government Sites of Conservation Significance, Lake Sylvester System*. Department of Natural Resources, Environment, the Arts and Sport (NRETAS).
http://www.nt.gov.au/nreta/environment/conservation/pdf/42_lakesylvester.pdf
http://www.nt.gov.au/nreta/environment/conservation/pdf/41_tarrabool.pdf

TIS, (2011)
http://dmetis.nt.gov.au/tis/OLQ.ASP?WCI=HeaderPage&WCE=Login

6. ABBREVIATIONS

BONN
: Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).

BOM
: Bureau of Meteorology

CAMBA
: China-Australia Migratory Bird Agreement (CAMBA), 1986. Australian Treaty Series 1988 No 22. Department of Foreign Affairs and Trade, Canberra. Agreement between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment (Canberra, 20 October 1986), Entry into force: 1 September 1988.

DMR
: Davenport Murchison Ranges

DSEWPC
: Department of Sustainability, Environment, Water, Population and Communities

EPBC Act
: Environment Protection and Biodiversity Conservation Act

GIS
: Geographic Information System

JAMBA
: Japan-Australia Migratory Bird Agreement (JAMBA), 1974.
Australia Treaty Series 1981 No. 6. Agreement between the Government of Australia and the government of Japan for the Protection of Migratory Birds in danger of Extinction and their Environment. Tokyo, 6 February 1974. Entry into force: 30 April 1981

NRETAS
: Natural Resources, Environment, The Arts and Sport

NTG
: Northern Territory Government

ROKAMBA
: Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA), 2006.
Agreement Between the government of Australia and the Government of the Republic of Korea on the Protection of Migratory Birds and Exchange of Notes, Canberra, 6 December 2006. Entry into force, 13 July 2007.

TIS
: Titles Information System

APPENDIX A:

EPBC ACT PROTECTED MATTERS REPORTS FOR TENEMENTS: EL27580, EL27712 & EL27992

EPBC ACT PROTECTED MATTERS REPORTS FOR TENEMENTS:

EL27580

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

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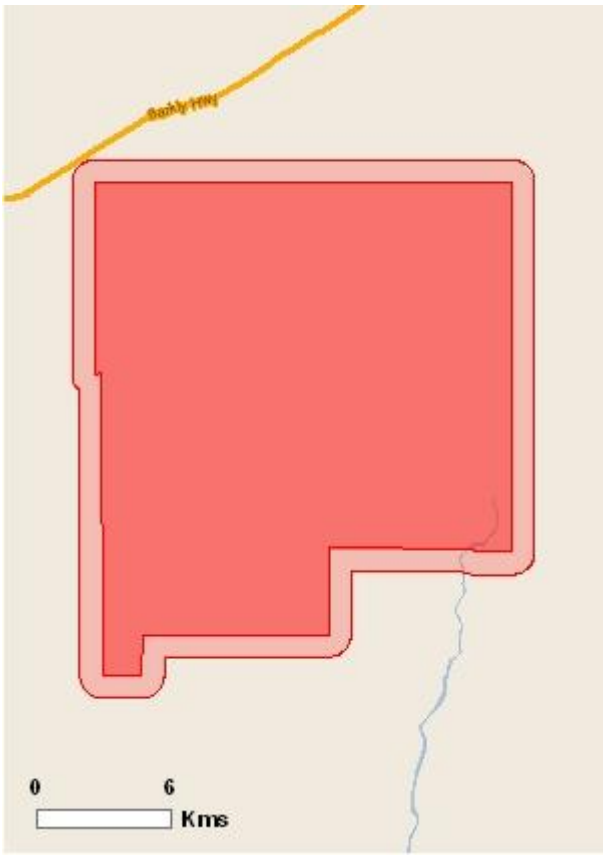

Coordinates
Buffer: 1.0Km

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 Communitites:	None
Threatened Species:	2
Migratory Species:	9

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:	7
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:	None
State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	5
Nationally Important Wetlands:	None

Details

Matters of National Environmental Significance

Threatened Species		**[Resource Information]**
Name	Status	Type of Presence
BIRDS		
Rostratula australis		
Australian Painted Snipe [77037]	Vulnerable	Species or species habitat may occur within area
MAMMALS		
Macrotis lagotis		
Greater Bilby [282]	Vulnerable	Species or species habitat likely to 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		
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may 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
Charadrius veredus		
Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area

Glareola maldivarum	
Oriental Pratincole [840]	Species or species habitat may occur within area
Rostratula benghalensis s. lat.	
Painted Snipe [889]	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Resource Information]

Name	Status	Type of Presence
Birds		
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
Charadrius veredus		
Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
Glareola maldivarum		
Oriental Pratincole [840]		Species or species habitat may occur within area
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may occur within area
Rostratula benghalensis s. lat.		
Painted Snipe [889]		Species or species habitat may occur within area

Extra Information

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 Resouces Audit, 2001.

Name	Status	Type of Presence
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 may occur within area
Vulpes vulpes		
Red Fox, Fox [18]		Species or species habitat may occur within area
Plants		
Cenchrus ciliaris		
Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Parkinsonia aculeata		
Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat may occur within area

Caveat

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-19.63333 134.45028,-19.51083 134.44972,-19.51111 134.44722,-19.43333 134.44722,-19.43333 134.61667,-19.58333 134.61667,-19.58333 134.60111,-19.58194 134.60111,-19.58167 134.5425,-19.61667 134.54222,-19.61694 134.46667,-19.63333 134.46639,-19.63333 134.45028

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EPBC ACT PROTECTED MATTERS REPORTS FOR TENEMENTS:

EL27712

Australian Government
Department of Sustainability, Environment, Water, Population and Communities

EPBC Act Protected Matters Report: Coordinates

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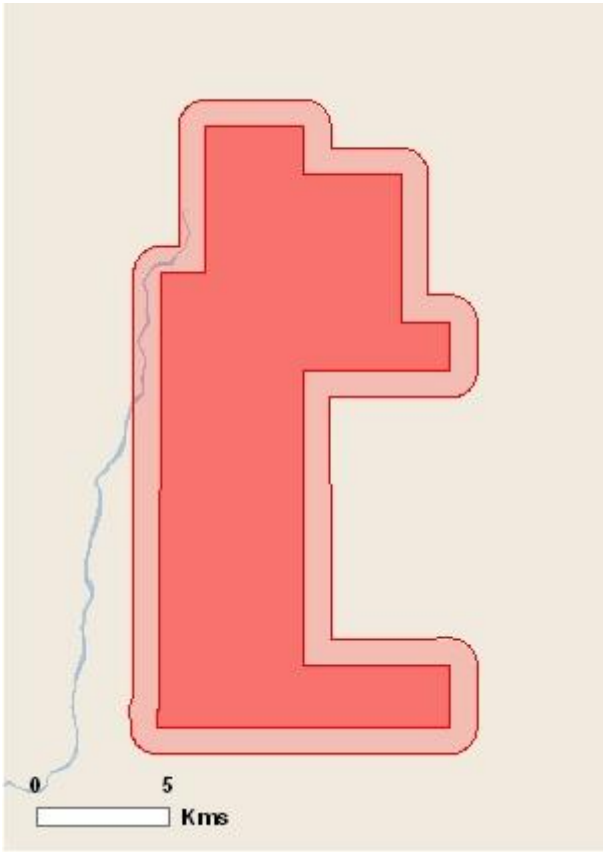

This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates
Buffer: 1.0Km

Summary

Matters of National Environmental Significance

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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 Communitites:	None
Threatened Species:	2
Migratory Species:	9

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Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	7
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:	None
State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	4
Nationally Important Wetlands:	None

Details

Matters of National Environmental Significance

Threatened Species		**[Resource Information]**
Name	Status	Type of Presence
BIRDS		
Rostratula australis		
Australian Painted Snipe [77037]	Vulnerable	Species or species habitat may occur within area
MAMMALS		
Macrotis lagotis		
Greater Bilby [282]	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		
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may 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
Charadrius veredus		
Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
Glareola maldivarum		

Oriental Pratincole [840]	Species or species habitat may occur within area
Rostratula benghalensis s. lat.	
Painted Snipe [889]	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

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Name	Status	Type of Presence
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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 Resouces Audit, 2001.

Name	Status	Type of Presence
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 may occur within area
Vulpes vulpes		
Red Fox, Fox [18]		Species or species habitat may occur within area
Plants		
Cenchrus ciliaris		
Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area

Caveat

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

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EPBC ACT PROTECTED MATTERS REPORTS FOR TENEMENTS:

EL27992

Australian Government
Department of Sustainability, Environment, Water, Population and Communities

EPBC Act Protected Matters Report: Coordinates

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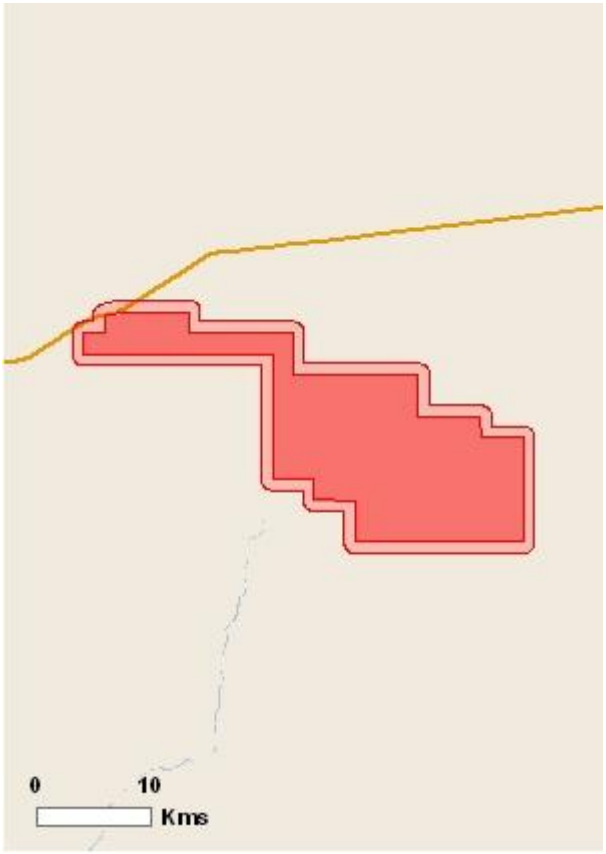

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Wetlands of International Significance (Ramsar Wetlands):	None
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APPENDIX B:

NRETAS CATEGORY DEFINITIONS LIST

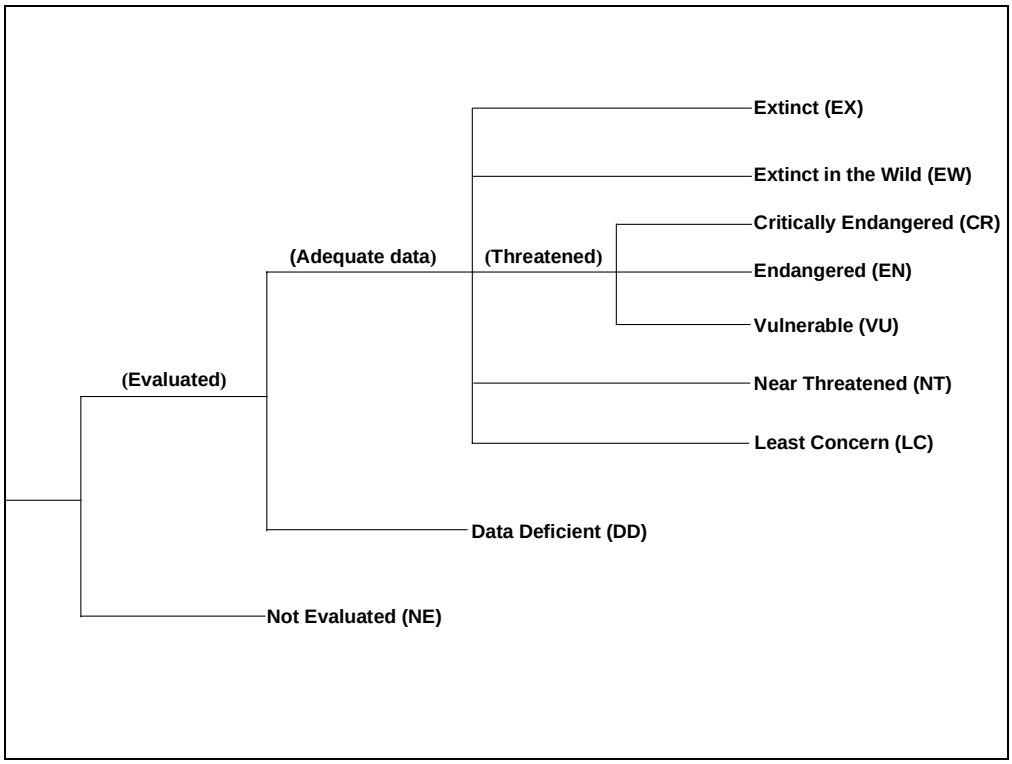


Figure 1. Structure of the categories.

3. Role of the different criteria

For listing as Critically Endangered, Endangered or Vulnerable there is a range of quantitative criteria; meeting any one of these criteria qualifies a taxon for listing at that level of threat. Each taxon should be evaluated against all the criteria. Even though some criteria will be inappropriate for certain taxa (some taxa will never qualify under these however close to extinction they come), there should be criteria appropriate for assessing threat levels for any taxon. The relevant factor is whether *any one* criterion is met, not whether all are appropriate or all are met. Because it will never be clear in advance which criteria are appropriate for a particular taxon, each taxon should be evaluated against all the criteria, and *all* criteria met at the highest threat category must be listed.

4. Derivation of quantitative criteria

The different criteria (A-E) are derived from a wide review aimed at detecting risk factors across the broad range of organisms and the diverse life histories they exhibit. The quantitative values presented in the various criteria associated with threatened categories were developed through wide consultation, and they are set at what are generally judged to be appropriate levels, even if no formal justification for these values exists. The levels for different criteria within categories were set independently but against a common standard. Broad consistency between them was sought.

5. Conservation actions in the listing process

The criteria for the threatened categories are to be applied to a taxon whatever the level of conservation action affecting it. It is important to emphasise here that a taxon may require conservation action even if it is not listed as threatened. Conservation actions which may benefit the taxon are included as part of the documentation requirements (see Annex 3).

6. Data quality and the importance of inference and projection

The criteria are clearly quantitative in nature. However, the absence of high-quality data should not deter attempts at applying the criteria, as methods involving estimation, inference and projection are emphasised as being acceptable throughout. Inference and projection may be based on extrapolation

IV. THE CATEGORIES [1]

A representation of the relationships between the categories is shown in Figure 1.

EXTINCT (EX)
A taxon is Extinct when there is no reasonable doubt that the last individual has died. A taxon is presumed Extinct when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.

EXTINCT IN THE WILD (EW)
A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range. A taxon is presumed Extinct in the Wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.

CRITICALLY ENDANGERED (CR)
A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered (see Section V), and it is therefore considered to be facing an extremely high risk of extinction in the wild.

ENDANGERED (EN)
A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered (see Section V), and it is therefore considered to be facing a very high risk of extinction in the wild.

VULNERABLE (VU)
A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable (see Section V), and it is therefore considered to be facing a high risk of extinction in the wild.

NEAR THREATENED (NT)
A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

LEAST CONCERN (LC)
A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.

DATA DEFICIENT (DD)
A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available. In many cases great care should be exercised in choosing between DD and a threatened status. If the range of a taxon is suspected to be relatively circumscribed, and a considerable period of time has elapsed since the last record of the taxon, threatened status may well

[1] *Note: As in previous IUCN categories, the abbreviation of each category (in parenthesis) follows the English denominations when translated into other languages (see Annex 2).*

be justified**.**

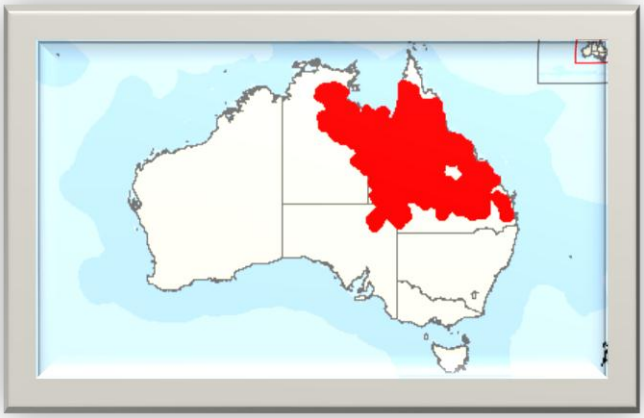
NOT EVALUATED (NE)
A taxon is Not Evaluated when it is has not yet been evaluated against the criteria.

APPENDIX C:
INVASIVE FLORA SPECIES PROFILES OF NATIONAL SIGNIFICANCE LIKELY TO BE IN THE TENNANT CREEK PROJECT AREA

Appendix c: Invasive Flora Species Profiles of National Significance Possibly Present at the Tennant Creek Project Area

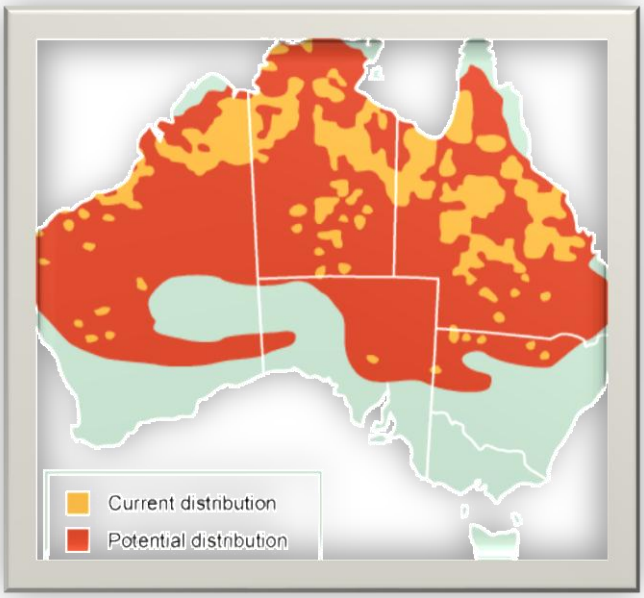
The following table portrays two of the 20 Invasive flora species as reported by the *Environmental Protection and Biodiversity Conservation Act 1999* (*EPBC Act*) Protected Matters database search, to be of national significance, as they pose a particularly significant threat to biodiversity, including those that may possibly occur in the Whistle Duck Project area.

Scientific Name	*Cenchrus cilias*
Common Name	Buffel-grass, Black Buffel-grass
Photograph	 *Cenchrus cilias* Photographer: Craig *et al*. (Florabase, 2011)

Distribution Map	 (Australian Government, 2011a)
Tenements where the species or species habitat may occur	EL2727580, EL27712, EL27992.
Key Points	• Shade and fire tolerant. • Adapted to frequent defoliation. • Capable of changing fire frequency and intensity. • Can begin producing seeds from approximately 3 months of age. • Rhizomatous cultivars can produce seeds, but produce fewer numbers. • Dormancy varies between climatic regions and can be broken by high temperatures. • Germination rates are highest on the soil surface and can be poor and unpredictable particularly in low rainfall regions. • Has developed resistance to some post-emergent herbicides.
Description	Perennial, caespitose grass.
Habit	Grass
How it spreads	Primarily wind and water, also mammals (on skin and fur), birds, vehicles.
Fire Response	Resprouts; Heat may kill seeds, however buried or protected seed may survive and readily germinate in the post-fire environment.
Flower colour	Purple between February and October.

Where it grows	White, red or brown sand, stony red loam, black cracking clay.
Origin	Africa, India and western Asia. Introduced for livestock forage, re-vegetation and erosion control (Florabase, 2011).

Scientific Name	*Parkinsonia aculeata*
Common Name	Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean
Photograph	 *Parkinsonia aculeata* Photographer: Wilson, C.G. Taken at : Rockhampton Downs, NT. (Australian Government, 2011b).

Distribution Map	 (Australian Government, 2011b)
Tenements where the species or species habitat may occur	EL27580.
Key Points	• Parkinsonia (*Parkinsonia aculeata*) is a fast grower and can flower as early as the summer of its second year of growth. • It is a threat to rangelands and wetlands • Use of chemicals produces less regrowth than if mechanical means are used • Control measures always need to be followed up as some trees may be missed during initial control and regrowth can occur from seeds and roots.

Description	Parkinsonia (*Parkinsonia aculeata*) is a spreading, much-branched shrub or tree to 8 or rarely 10 m tall. It has a deep taproot and extensive surface roots. Its stems are slender, drooping and tend to zig-zag, with thorns 5-20 mm long. Parkinsonia leaves consist of a flat, green leaf stalk up to 300 mm long and 2-3 mm wide with numerous small (4-10 mm) green oblong leaflets staggered along both sides. The leaf base is protected by sharp, recurved spines, 5-15 mm long, which persist in older branches. The fragrant flowers are up to 20 mm in diameter, with five petals, and predominantly yellow. The top petal either has orange spots or turns completely orange. Each flower grows on a long, slender, drooping stalk arising from leaf joints in groups of 8 to 12. The fruit is an elongate, almost straight pod about 3-13 cm long and 3.5-8 mm wide and narrows at both ends; it is somewhat flattened and usually has pronounced constrictions between each of the seeds and at maturity is a pale brown or yellow-brown. Seeds, of which there are usually just 2-4 per fruit pod, but sometimes up to 8, are oval or oblong in shape, 9-15 mm long, 3-4 mm wide, and are olive green to brown.
Distribution	In Australia most infestations occur in coastal, central and western Queensland, central and northern parts of the Northern Territory, and the Pilbara and Kimberley regions of Western Australia. Isolated populations have been recorded in South Australia and western New South Wales. It is been estimated that at least 800 000 hectares of land are infested with this species
Habit	Shrub, Tree
How it spreads	Parkinsonia produces abundant seed, a typically mature plant producing about 5 000 seeds per year and large specimens more than 13 000. They fall within the pods which can be widely dispersed in moving water. The pods are relatively unpalatable and so spread by animals feeding on them is probably a minor method of dispersal. Both seeds and pods can be dispersed on unclean machinery, for example, in mud.
Where it grows	Commonly on seasonally flooded sites but also around dams and bores, as well as stream banks and floodplains; on sand to clay soils. It inhabits pastures, roadsides, grasslands, open woodland and rangelands.
Flower colour	Yellow

Impacts	Parkinsonia is a Weed of National Significance. It is regarded as one of the worst weeds in Australia because of its invasiveness, potential for spread, and economic and environmental impacts. Parkinsonia has the potential to invade more than three quarters of mainland Australia. Plants can form dense impenetrable thickets on rangelands and wetlands, making areas of land inaccessible for people and animals. Seed pods float and are easily spread by water. Thickets can be up to several kilometres across. Cattle are difficult to muster in paddocks where Parkinsonia infestations are thick. Access to watering points is impaired by the thickets which also shade out valuable pastures and displaces native vegetation when left untreated. Parkinsonia can dam watercourses, cause erosion, and lower water tables. A very hardy plant that can withstand long dry spells. Seeds remain viable for many years. Parkinsonia infestations provide refuges for feral animals especially pigs
Origin	Parkinsonia is native to tropical regions of the Americas, from the southern regions of the United States to northern South America (e.g. Colombia, Costa Rica, Guatemala, Panama and Peru). It has been introduced to some South American countries (including mainland Ecuador and El Salvador) and many other regions, including tropical Africa, the Middle East, Italy, Cyprus, India, Pakistan, Thailand, Cambodia, Vietnam, Indonesia, many Pacific islands (e.g. Hawaii, Tahiti) and Australia. Parkinsonia is believed to have been introduced into Australia in the 1890s and early 1900s for use as an ornamental in towns and (perhaps subsequently) as a shade tree around homesteads and bores in northern Australia (Australian Government, 2011b).

References

Florabase, (2011)

http://florabase.calm.wa.gov.au/browse/profile/258

Australian Government, (2011a)

http://www.weeds.gov.au/cgi-bin/weeddetails.pl?taxon_id=20213

Australian Government, (2011b)

http://www.weeds.gov.au/cgi-bin/weeddetails.pl?taxon_id=19566

APPENDIX D:

PROFILES OF THE THREATENED FAUNA SPECIES THAT ARE POSSIBLY PRESENT AT THE TENNANT CREEK PROJECT AREA

Appendix D: Profiles of the Threatened Fauna Species that are Possibly Present at the Tennant Creek Project Area

This appendix provides the profiles of Threatened Fauna species with the potential to occur in the Tennant Creek Project area, as determined by a desktop search in April 2011.

- Two different database searches were conducted to produce these results: A search of species listed under the federal government database using the "Protected Matters Search Tool". This information provides general guidance on matters of national environmental significance and other matters protected by the *Environmental Protection and Biodiversity Conservation Act 1999* (*EPBC Act*). The Protected Matters Search Tool is managed by the Department of Sustainability, Environment, Water, Population and Communities and is publically available online (DSEWPA, 2011).
- A search of the Northern Territory's Department of Natural Resources, Environment,

  The Arts and Sport (NRETAS) database, pursuant to the Northern Territory Government's *Territory Parks and Wildlife Conservation Act 2009*.

The cause of decline is not always know in these animals, however, it is likely that the processes of environmental degradation and habitat homogenization that have occurred throughout arid Australia following European settlement have also negatively affected its populations. Changes in fire regimes, grazing by introduced herbivores including cattle and rabbits, and predation by introduced predators are all likely threatening processes.

Australian Painted Snipe (*Rostratula australis*)

Conservation Status: **Australia:** Vulnerable; **Northern Territory:** Vulnerable.

(NRETAS, 2011).

Description

The Australian Painted Snipe is a wader of around 220-250mm in length. The head, neck and upper breast is chestnut-bronze. The back and wings are dark olive-green, finely barred black and are ornamented with bright chestnut spots and black bars. The back has a conspicuous buff coloured V. A broad white band separates the neck and wings. There is a broad white horizontal band through the eye. The male is a smaller, less colourful bird, lacking the rufous on the hindneck. This species is generally inconspicuous, and occurs solitarily or in only small parties.

Distribution

Until recently, the Australian Painted Snipe was generally considered part of a more widespread species that extended throughout Indonesia, Asia and Africa and on many Pacific Islands. As redefined, the species is now considered restricted to Australia. Australian Painted Snipe are most frequently recorded in south eastern Australia. In the Northern Territory it was recorded breeding at Tarrabool Lake on Eva Downs on the Barkly Tablelands in 1993, with non-breeding records from Lake Woods in 1993 and an un-named swamp on Sturt Plateau in 2001. It is likely that the species could occur on any shallow ephemeral wetlands in central or southern Northern Territory. It is also possible that the species could occur in northern areas of the NT.

Habitat

Australian Painted Snipe occur in shallow, vegetated, freshwater swamps, claypans or inundated grassland (including temporary wetlands).

Diet

Australian Painted Snipe Feed at the water's edge and on mudflats, taking seeds and probing for invertebrates.

Behaviour

It is unknown whether the Australian Painted Snipe is resident. They may well be nomadic. Its occurrence appears to be unpredictable. It is unobtrusive during the day, feeding primarily at night (NRETAS, 2011).

Greater Bilby (*Macrotis lagotis*)

Conservation Status: **Australia:** Vulnerable. **Northern Territory:** Vulnerable.

(NRETAS, 2011a).

Description

The Greater Bilby is a large bandicoot (body mass males, 800-2500 g; females, 600-1100 g) with soft silky fur. The fur is ash grey over most of the body, whereas on the belly it is pure white to cream. The basal 20 percent of the tail is the same colour as the upper-body, the central 40 percent is black and the distal 40 percent, pure white. The forelimbs are robust and equipped with three stoutly clawed toes (and two unclawed toes) giving the animal a formidable burrowing capacity. The slender hind limbs are long and resemble those of macropods. The snout is long and delicate and the ears are large and rabbit-like.

Distribution

Within the Northern Territory, it occurs in the central and western parts of the Tanami bioregion, the southern Sturt Plateau bioregion and the northern Great Sandy Desert bioregion. The distribution is highly fragmented within this area. Historically, the Greater Bilby occupied a vast area of arid and semi-arid Australia. Its distribution declined dramatically in the years following European settlement and it now occupies about 20% of its former range. The species occurs in two separate geographic areas; one extending from the western deserts region of the Northern Territory and Western Australia north to the Pilbara and Kimberley regions, the second in the Channel Country of south-west Queensland.

Habitat

Habitat of the Greater Bilby in the Northern Territory is characterised by sandy soils dominated by hummock grasslands covered predominantly by three species of spinifex, *Triodia basedowii*, *T. pungens* and *T. schinzii*. An overstorey of low shrub cover dominated

by *Acacia* and *Melaleuca* species grows over much of this country. This predominantly sandy landscape also includes rocky outcrops, laterite rises and low lying drainage systems.

Diet

The Greater Bilby is omnivorous and major foods vary across seasons. Important plant foods include seed from various grasses and sedges including Button Grass (*Dactyloctenium radulans*), Desert Flinders Grass (*Yakirra australiensis*) and Parakeelya (*Calandrinia* spp.) and bulbs from Bush Onion or Yalka (C*yperus bulbosus*) and *Wurmbea deserticola*, many of which are most abundant soon after fires. At a site in central Australia, fruiting bodies of underground fungi were the major dietary component. Major invertebrate prey includes termites, ants, beetles, insect larvae and siders. Most of the food of the Greater Bilby is excavated from the soil and holes may attain 25cm in depth.

Breeding

Litters, comprising one to three young, can be produced at any time of year. Young remain in the pouch for approximately 75 days, before being cached and suckled in maternal burrows for a further two weeks prior to independence. Under ideal conditions, there is the potential to produce four litters every year. Captive animals live up to 10 years.

Behaviour

Bilbies dig burrows up to two metres deep and an individual may have over a dozen regularly used burrows within its home-range. Bilbies forage at night. Movements of 5 km during one night have been recorded for male bilbies. Males, females and juveniles may occupy overlapping home ranges. Densities of 12–16 individuals/km^2 are reached in optimal habitat. However; a density of 1-2/km^2 is more typical (NRETAS, 2011a).

References

NRETAS, (2011)

http://www.nt.gov.au/nreta/wildlife/animals/threatened/pdf/birds/paintedsnipe_vu.pdf

NRETAS, (2011a)

http://www.nt.gov.au/nreta/wildlife/animals/threatened/specieslist.html

http://www.nt.gov.au/nreta/wildlife/animals/threatened/pdf/mammals/greater_bilby_vu.pdf