EPURON
POWER FOR PORTFOLIOS

Proposed development of the Silverton Wind Farm, western New South Wales:

Stage 2 and powerline route

(Broken Hill to Red Cliffs)

Biodiversity Constraints Technical Report

ngh environmental

April 2008

Acknowledgements

nghenvironmental acknowledges the assistance and contribution of the following people in the preparation of this report:

- John Benson
- Ian Sluiter
- Steven Sass
- Shane Priddle

nghenvironmental

Suite1 216 Carp Street (PO Box 470) Bega NSW 2550

phone (02) 6494 7771 fax (02) 6494 7773 email ngh@nghenvironmental.com.au

a division of Nicholas Graham Higgs Pty Ltd abn 38 711 349 561

Document Verification

ngh environmental
planning • assessment • ems • auditing

Job title: Biodiversity Constraints Technical Report
Silverton Stage 2-3 and power line route

File Name		Tech report - stage 2,3 and powerline.doc					
Revision	Date	Prepared by		Checked by		Approved by	
Draft	January 2008	name	Kelly Simpson (Project Officer) and Brooke Marshall (Project Officer)	name	Nick Graham-Higgs	name	Nick Graham-Higgs
Final	April 2008		Brooke Marshall (Project Officer)				

Table of Contents

List of Tables

1. INTRODUCTION

This *Biodiversity Constraints Report* has been prepared for Silverton Wind Farm Pty Ltd JV in order to identify the key flora and fauna constraints of the proposed Silverton Wind Farm. This report concerns areas that would be affected by Stage 2 of the proposal, including the power line from Broken Hill to Red Cliffs. Stage 1 of the proposed wind farm has been considered in more detail in a separate *Biodiversity Assessment Report* (**ngh**environmental, March 2008).

This is a technical report based largely on desktop assessment however, the results of the comprehensive investigation of the Stage 1 area have been extrapolated to achieve a better understanding of the Stage 2 area. No evaluation of potential impact is undertaken in this report, rather key flora and fauna constraints are described and mapped to assist the delineation of vegetation communities and fauna habitat of conservation significance under NSW *Threatened Species Conservation Act* 1995 and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. A summary of key constraints is presented in Section 5. Recommendations are provided to assist in avoiding or minimising impact on areas of high constraint.

Impact assessment is addressed in the Part 3A Environmental Assessment Report.

2. THE PROPOSAL

The Silverton wind farm, proposed for the Barrier Ranges north of Silverton, NSW would at completion generate approximately 1000 MW of electricity. Due to the scale of the project, it would be assessed and constructed in stages. This report deals only with the Stage 2 turbine envelope and the power line duplication between Broken Hill and Red Cliffs, which would also be developed as part of Stage 2.

2.1. Stage 2: turbine envelope

Stage 2 would see the installation of up to 478 turbines, additional to those constructed during Stage 1. The turbine envelope (the indicative area in which turbines would be positioned) for all stages of the proposed Silverton wind farm is approximately 30,000 hectares in area. Stage 2, located adjacent to Stage 1, represents approximately 75% of this area. The Stage 2 area is delineated on the accompanying constraints maps, Appendix A.

It is understood that tracks, turbine footings and hardstand areas will be required within discrete locations of the turbine envelope.

2.2. Power line route: Broken Hill to Red Cliffs

The proposed power line, that will duplicate an existing high voltage power line, would be approximately 300 kilometres long, from Broken Hill to Red Cliffs. The majority of the route is within New South Wales however, 1.3 kilometres is within Victoria (Mildura to Red Cliffs).

The power line would require pole footings to be excavated at discrete intervals of approximately 250-500m. It is understood that the line voltage of the power line would require that an easement of approximately 50m be created and maintained adjacent to the existing easement. Clearing would be required where trees occur prior to line raising. Maintenance would be required consistent with Transgrid procedures. It may be feasible to overlap the easement required for the new powerline with the existing easement. Furthermore, it may be feasible to retain native vegetation beneath the lines where line clearance permits, thereby minimising clearing.

3. APPROACH

3.1. Vegetation assessment

3.1.1. Stage 2: turbine envelope

For Stage 2, desktop vegetation mapping was undertaken using high resolution aerial photography. Vegetation communities and habitat types equivalent to those occurring in the Stage 1 area were identified and mapped using high resolution orthophotos and ArcView GIS.

An assumption of this approach is that key vegetation communities at Stage 2 will be similar to those recorded in Stage 1. This approach was formulated after initial site visits to Mount Robe, located within the Stage 2 turbine envelope. This vantage provided an indication of the on-ground resources within Stage 2 which appeared similar to the Stage 1 area.

Vegetation communities have been identified using the classification developed by Benson *et al*. (2006) for the NSW western plains. The assessment of conservation significance and status of vegetation communities is based on estimates of original extent, current extent and reservation identified in Benson *et al*. (2006).

3.1.2. Power line route

Vegetation mapping of the proposed power line easement involved a field assessment carried out between the 27th and 29th November 2007 by botanists Kelly Simpson and Ian Sluiter. The survey area comprised a 300 km long power line easement between Broken Hill (NSW) and Red Cliffs (VIC). The field survey was undertaken by driving the entire length of the existing power line and recording the vegetation communities within a 100m corridor either side of the existing easement. The total survey area amounts to approximately 6000 ha. The spatial extent of each vegetation community was recorded using a hand-held Global Positioning System (GPS). All eastings and northings recorded are in GDA. Changes in the vegetation communities were recorded at a scale of 10-50m. Subtle vegetation changes occurring within a distance of less than 10m were not recorded.

The location, condition and approximate spatial extent within the easement corridor of any species and communities of conservation significance, and noxious or invasive weeds present were also recorded. No targeted vegetation surveys were conducted along the easement for threatened flora however, incidental sightings of threatened species were recorded.

Vegetation communities and conservation significance and status within NSW have been identified after Benson *et al*. (2006). Vegetation communities within Victoria have been classified according to the Ecological Vegetation Classes (EVCs) as defined by the Department of Sustainability and Environment (DSE) in Victoria. The EVCs are typically considered in terms of the bioregion in which they occur. The combination of EVC and bioregion is used to determine the bioregional conservation status (BCS) of an EVC (VIC DSE website 2008).

The general condition of the vegetation within the study area was determined through several factors. These include:

- Disturbance by grazing and/or logging practices;
- The cover/abundance of native and exotic understorey; and
- The age and structural integrity of the vegetation community.

One of five condition scores (poor, moderate, good, very good and excellent) was used to rank each area of vegetation in the study area. Vegetation condition scores were adapted after Ogyris P/L © (2007):

Table 3-1Criteria for assessment of remnant vegetation in the Murray-Darling depression IBRA and Victorian mallee.

The classification allocates a condition rating from excellent to poor quality.

Condition Rating	Description
Excellent	**Vegetation structurally and floristically intact or almost so; weed invasions minimal or weeds absent; disturbance minimal or absent.**
Very Good	**Vegetation structurally and floristically substantially intact; low levels of weed invasion; low levels of disturbance.**
Good	**Vegetation partially intact structurally and/or floristically; moderate levels of weed invasion and disturbance.**
Moderate	**Vegetation comprised of less than 50% cover of indigenous species and/or with much reduced species richness; in the case of woody vegetation the upper strata may provide moderate to high cover but the field layer is substantially exotic; high levels of disturbance.**
Poor	**Vegetation grossly modified with scattered to rare dominants of upper strata only persisting; very high cover of weeds; current or former levels of disturbance high or very high.**

3.2. Fauna habitat attributes

3.2.1. Stage 2 : turbine envelope

Key habitat features were identified, extrapolating from information obtained in the comprehensive biodiversity assessment of Stage 1, located adjacent to the Stage 2 envelope. An assumption of this approach is that key habitat features at Stage 2 will be similar to those recorded in Stage 1. This approach was formulated after initial site visits to Mount Robe (September 2007, November 2007), located within the Stage 2 turbine envelope. This vantage provided an indication of the on-ground resources within Stage 2 which appeared similar to the Stage 1 area.

3.2.2. Power line route

No targeted fauna surveys were conducted along the easement for threatened fauna however, incidental sightings of fauna and quality habitat resources were recorded.

3.3. Threatened species

Species listed under the NSW *Threatened Species Conservation Act* 1995 and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* have been collated for the proposed works areas within NSW. The NSW DECC Wildlife Atlas, Bionet and Commonwealth EPBC Matters of National Significance databases were searched to identify threatened species within the area of the turbine envelope and power line route that may potentially be affected by the proposal. The *Flora and Fauna Guarantee Act 1988* (*FFG Act)* is the key piece of Victorian legislation for the conservation of threatened species and communities.

The potential impact upon these species has not been thoroughly assessed in this report. This report undertakes only to identify key species that may require further investigation.

4. RESULTS

4.1. Vegetation

4.1.1. Stage 2: turbine envelope

Based on aerial photo interpretation and site visits to the Stage 2 area, it has been determined that the vegetation communities present within the Stage 1 turbine envelope are generally present within the broader area of Stage 2. These are discussed briefly below.

Mulga – dead finish on stony hills

This tall open shrubland is dominated by Mulga (*Acacia aneura*) and Dead Finish (*Acacia tetrogonophylla*) with Belah (*Casuarina pauper*) also present. It occurs on skeletal or shallow, stony soils on steep slopes, hillcrests, midslopes and terraced flats of elevated landscapes. This vegetation community is predicted to become a threatened community if the regeneration of key species does not occur (Benson *et al.* 2006).

Prickly wattle open shrubland of drainage lines

This shrubland is found in both stony hills and ranges and the low hills of the Barrier Range Complex Bioregion along ephemeral drainage lines. The dominant shrub in this community is Prickly wattle (*Acacia victoriae*) while the understorey of chenopod shrubs includes black bluebush (*Maireana pyramidata*) and Thorny saltbush (*Rhagodia spinescens*).

Bluebush shrubland on stony rises and downs of the arid zone

This chenopod shrubland community comprises of numerous bluebush species; Black bluebush (*Maireana pyramidata*), Pearl bluebush (*M. sedifolia*), copperburrs (*Sclerolaena* spp) and Ruby saltbush (*Enchylaena tomentosa*) form a major component of this community. It has been identified in the area where red or brown clays or red loams occur. Benson *et al.* (2006) suggests that without total active management of all pastoral leases across western NSW of grazing and feral herbivore control, bluebush shrubland could become threatened over the long term.

Bladder saltbush shrubland on stony plains and downs of the arid zone

This vegetation community is dominated by Bladder saltbush (*Atriplex versicaria*) with many other chenopod species also present such as copperburs and bluebush. While this community is regarded as threatened by heavy grazing, particularly in the east portion of western NSW, the presence of bladder saltbush suggests that current grazing management across many areas of the study site is sympathetic to its current ecological integrity.

River red gum open woodland

This open woodland community occurs on sandy or loamy soils in sandy creeks and is dominated by River red gum (*Eucalyptus camaldulensis* subsp. *obtusa*). This community is regarded as of 'least conservation concern' as it is relatively common and undisturbed in the landscape.

River red gum woodland of rocky creeks

While this vegetation community is also dominated by River red gum (*Eucalyptus camaldulensis* subsp. *obtusa*), the presence of species such as Mulga (*Acacia aneura*) and Dead finish (*Acacia stenophylla*) typically associated with rocky hills,

indicate the landscape position of this community which is confined to gravelly creeks on hillsides or rocky gorges. Sticky hopbush (*Dodonea viscosa* subsp. *angustissima)* and Cough bush (*Cassinia laevis*) provide a very sparse shrub layer in places. Grasses such as Kanagroo grass (*Themeda australis*) and *Digitaria brownii* contribute to a very sparse ground layer of vegetation, typical of this community. This community is of 'least conservation concern' as it is relatively common and undisturbed in the landscape.

Porcupine grass – red mallee – gum coolibah hummock grassland / low sparse woodland

This community is presently undescribed as per Benson *et al.* (2006) and has not been identified elsewhere in NSW. So far it has been identified by field surveys only within the Stage 1 envelope but aerial photos indicated it also occurs within the Stage 2 envelope. This community is dominated by Red Mallee (*Eucalyptus socialis*) and Gum Coolibah (*Eucalyptus intertexta*). A description of this vegetation community is currently being written by John Benson which provides the following information.

Black bluebush low open shrubland of the alluvial plains and SAND PLAINS of the arid and semi-arid zones

This vegetation community is found on the Mundi Mundi Plain on the Barrier Range Alluvial Fans and is generally dominated by black bluebush (*Marieana pyramidata*) and other chenopods such as copperburrs and occurs primarily on deep, sandy-loam soils of drainage depressions.

Sand plain Mulga

This tall open shrubland is dominated by Mulga (*Acacia aneura*) with other shrub species such as Belah (*Casuarina pauper*), Turpentine bush (*Eremophilia sturtii*) and Punty Bush (*Senna* form taxon '*filifolia*'). In the area, it occurs in the small patches near ephemeral drainage lines and on sandy areas in the eastern portion of the study area. Benson *et al.* (2006) predict that the community may be threatened in the future if heavy grazing pressures continue in some areas inhibiting the regeneration of key species.

Black oak woodland

This low open woodland is dominated by Black Oak (*Casuarina pauper*) and Western Rosewood (*Alectryon oleifolius*). It occurs locally on rocky hills.

Additional vegetation communities may occur. A field assessment will be required to identify additional vegetation communities on site.

4.1.2. Power line route

A total of 23 described vegetation communities and one undescribed vegetation community were identified along the existing power line easement during the ecological investigation. A summary of vegetation communities along the route as well as a qualitative assessment of vegetation condition and conservation status is provided in Appendix B and mapped in Appendix C. Vegetation descriptions and structure, including height are summarised in Table 4-1.

The results are discussed separately below for the sections of the route within New South Wales and the sections within Victoria.

New South Wales

The proposed power line would extend across two Bioregions within NSW, the Broken Hill Complex Bioregion in the north and the Murray Darling Depression Bioregion in the south.

The Broken Hill Complex Bioregion extends approximately 80-90km south of Broken Hill. Dominant vegetation communities within this area include chenopod shrublands composed of saltbush and bluebush communities, Belah Rosewood Woodlands and Mulga (*Acacia aneura*) communities. The *Acacia loderi* Shrublands EEC (Benson Community ID 128) was identified at a number of locations within this bioregion during the field work and is discussed further in this section (*New South Wales - Vegetation of conservation significance).*

The majority of the proposed power line is located within the Murray Darling Depression Bioregion and extends from the Broken Hill Complex Bioregion south to the Murray River. The landscape within this Bioregion is characterised by dunefields, sandplains and undulating plains of brown calcareous soils (NSW National Parks and Wildlife Service 2003). The dunefields are dominated by mallee communities with varying understorey components. The sand dunes, which run in an east-west direction, are dominated by porcupine grass (*Triodia scariosa*) while the swales between the dunes are characterised by chenopod shrub understorey. Sandplains are characterised by Belah Rosewood Woodlands with River Red Gum (*Eucalyptus camaldulensis*) and Black Box (*Eucalyptus largiflorens*) communities occupying the floodplain areas. Slender Cypress Pine (Benson Community ID 21) was noted along sandy rises and is referable to the Sandhill Pine Woodland Preliminary Determination EEC of the Riverina, Murray-Darling Depression and NSW South Western Slopes Bioregions (NSW DECC website 2008). This proposed EEC is discussed further in this section (*New South Wales - Vegetation of conservation significance).*

Another plant community was identified within the NSW section that has not been described by Benson *et al.* (2006) and may not have been previously recorded within the area. The undescribed community consists of White Cypress Pine (*Callitris glaucophylla)* and Slender Cypress Pine (*Callitris gracilis subsp. murrayensis*) with *Triodia scariosa subsp. scariosa* understorey. Ian Sluiter who has worked as a botanist in the region for many years believes this to be a new community and has suggested that it would almost certainly qualify as endangered and should be nominated as an EEC (Ian Sluiter pers comm., January 2008). This community is located at:

Easting	**Northing**	**Location**
552008	6360479	East and West of easement centreline (CL)
552159	6359395	East and West of easement centreline (CL)

Certain areas of the existing power line cross through cleared agricultural land and cropped agricultural land. The locations of these areas are detailed in Appendix B, these are predominately towards the south of the power line.

Agricultural land varied along the route and included:

- Semi-cleared, cropped land with scattered Blackbox remnants;
- Irrigated cropping for vineyards; and
- Charcoal farms consisting of cleared and regrowth mallee.

Table 4-1 Description of vegetation communities identified within the study area in NSW

* Threat Category, as according to Benson *et al* (2006), is based on pre-European extent, current extent and representation in protected areas.

\# As listed under the NSW TSC Act 1995.

Benson Vegetation Community ID	Vegetation Description	Structure	Threat Category* Conservation status in NSW#
11	**River Red Gum - Lignum very tall open forest or woodland on floodplains of semi-arid (warm) climate zone.** Dominated by River Red Gum (*Eucalyptus camaldulensis*) with patches of River Coobah (*Acacia stenophylla*), Lignum (*Muehlenbeckia florulenta*) and Nitre Goosefoot (*Chenopodium nitrariaceum*) as a shrub understorey. Occurs on heavy grey clay soil in drainage depressions and flood-outs of major water courses on the floodplains along western sections of the Murray River.	Tall open forest/woodland to about 20m high.	*Near Threatened
13	**Blackbox - Lignum woodland of the inner floodplains in the semi-arid (warm) climate zone** Dominated by sparse to dense stands of Lignum (*Muehlenbeckia florulenta*), Nitre Goosefoot (*Chenopodium nitrariaceum*) and River Coobah (*Acacia stenophylla*). The ground cover includes low shrubs such as *Sclerolaena muricata var. muricata*, *Enchylaena tomentosa*, *Einadia nutans subsp. nutans* and various saltbush species (*Atriplex spp.*). Occurs on clay or clay-loam, often gilgaied, soils on inner floodplains and on alluvial plains mostly in depressions that are frequently flooded. A widespread community along rivers in south-western NSW including the Murray River. In more arid areas of the Murray-Darling Depression Bioregion this community grades into the Black Box - chenopod community (ID15) that occurs on higher ground and contains less or no lignum and more chenopod shrubs.	Woodland, open forest/woodland averaging about 15 m high.	*Vulnerable
15	**Black Box open woodland with chenopod understorey mainly on the outer floodplains in south-western NSW** Woodland or open woodland dominated by Black Box (*Eucalyptus largiflorens*) with an understorey of chenopod shrubs such as Black Bluebush (*Maireana pyramidata*), *Maireana decalvans*, Nitre Goosefoot (*Chenopodium nitrariaceum*) and Old Man Saltbush (*Atriplex nummularia*) but the latter has mostly disappeared due to grazing. Small shrubs include Bladder Saltbush (*Atriplex vesicaria)* and Cotton Bush (*Maireana aphylla*) with a ground cover of annual or perennial saltbushes, copperburrs, grasses and forbs. Occurs on alkaline brown or grey clay soil on alluvial plains or sandy-loam soils on the flood plain of river systems.	Open Woodland, Woodland averaging about 15 m high.	*Near Threatened

Benson Vegetation Community ID	Vegetation Description	Structure	Threat Category* Conservation status in NSW#
21	**Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises of the semi-arid (warm) and arid climate zones** Open woodland composed of Slender Cypress Pine (*Callitris gracilis subsp. murrayensis*) and Sugarwood (*Myoporum platycarpum subsp. platycarpum*), sometimes with Western Rosewood (*Alectryon oleifolius subsp. canescens*). A sparse shrub layer includes *Dodonaea viscosa subsp. angustissima*, *Rhagodia spinescens*, *Senna* form taxon '*filifolia*', *Hakea tephrosperma* and *Maireana pentagona*. The ground cover is sparse and includes *Sclerolaena obliquicuspis*, *Zygophyllum apiculatum*, *Austrostipa nodosa*, *Enchylaena tomentosa*, *Enneaopogon cylindricus* and *Austrodanthonia caespitosa*. Occurs on calcareous sandy loam soils on low dunefields or lunettes sometimes on floodplains above flood levels Most occurrences are severely degraded due to the impacts of grazing by rabbits and sheep and some clearing. An endangered and poorly protected community.	Open Woodland; Isolated Trees.	*Critically Endangered #Sandhill Pine Woodland Proposed EEC
58	**Black Oak - Western Rosewood open woodland on deep sandy loams of Murray-Darling Depression and Riverina Bioregions** Dominated by Black Oak (*Casuarina pauper*) and Western Rosewood (*Alectryon oleifolius subsp. canescens*) with either a shrubby or grassy understorey. Occurring on level to undulating sandplains, sandy rises and inter-dune swales. Widely distributed in the far south-western NSW mainly in the Murray Darling Depression Bioregion, generally subject to less than 400 mm of annual rainfall.	Open Woodland/ Woodland to isolated clump of trees averaging around 7m high.	*Near Threatened
119	**Sandplain Mulga tall open shrubland of the semi-arid and arid climate zones** Very tall shrubland dominated by Mulga (*Acacia aneura*) often with Black Oak (*Casuarina pauper*), Sandhill Wattle (*Acacia ligulata*) and woody native regrowth species such as Turpentine Bush (*Eremophila sturtii*), Punty Bush (*Senna* form taxon *'filifolia'*) and Hopbush (*Dodonaea viscosa subsp. angustissima*). Stands of Western Rosewood (*Alectryon oeliefolius*), Neila (*Acacia loderi*), Colane (*Owenia acidula*) or Whitewood (*Atalaya hemiglauca*) are occasionally present. Occurs on calcareous red loams and deep red dune sands on undulating sandplains or swales in dunefields in the semi-arid zone of western NSW.	Shrubland; Open Shrubland, usually 5-10m high.	*Near Threatened
124	**Sandhill Wattle tall open shrubland on sand ridges in the arid zone** Tall open shrubland dominated by Sandhill Wattle (*Acacia ligulata*) sometimes with Mulga (*Acacia aneura* sens lat) or shrubs such as *Dodonaea viscosa subps angustissima*, *Hakea leucoptera* or *Grevillea stenobotrya*. The ground cover is generally very sparse but after rain may be dense. Occurs on deep, often calcareous, sand on sand ridges or dune crests mainly in the Simpson-Strezlecki Dunefields Bioregion of far northwestern NSW.	Open Shrubland, usually 2-4m high.	*Least Concern

Benson Vegetation Community ID	Vegetation Description	Structure	Threat Category* Conservation status in NSW#
128	**Nelia tall open shrubland of semi-arid sandplains** Very tall, open shrubland, dominated by Neila (*Acacia loderi*) occurring with low trees of Black Oak (*Casuarina pauper*) with clumps of Western Rosewood (*Alectryon oleifolius*) and Leopardwood (*Flindersia maculata*). Occurs on solonized brown and duplex soils and calcareous, loamy sands on flats or undulating sandplains of far central and south western NSW in the semi-arid zone. Most common in the northern part of the Murray-Darling Depression Bioregion south of the Barrier Highway extending as far south as Mungo National Park. Also in the southern part of the Broken Hill Complex Bioregion. Although widely distributed, it is threatened by lack of regeneration of palatable shrub species, including Acacia species, due to overgrazing by stock, rabbits and goats.	Open Shrubland/ Sparse Shrubland up to 8m high.	*Endangered # *Acacia loderi* Shrublands EEC
139	**Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid regions** Tall open shrubland dominated by Prickly Wattle (*Acacia victoriae*), Narrow-leaved Hopbush (*Dodonaea viscose subsp. angustissima)*. Understorey sparse with Ruby Saltbush (*Enchylaena tomentosa*), *Maireana spp*., *Sclerolaena spp*., *Dissocarpus paradoxus* and annual daisies. Occurs on sandy loams and sands on dunes in the semi-arid zone of far south western plains of NSW mainly in the Murray-Darling Depression Bioregion.	Open Shrubland, usually 2-7m high.	*Vulnerable
153	**Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones** Mid-high open shrubland generally less than one meter high dominated by Black Bluebush (*Maireana pyramidata*) which may be very dominant. Scattered low trees of Black oak (*Casuarina pauper*) or Western Rosewood (*Alectryon oleifolius subsp. canescens*) may be present. Tall shrubs are rare or absent and may include *Eremophila sturtii*. Occurs on red-brown duplex soils with textures of clay loam, sandy-loam or light clay on low sandy rises, undulating sandplains, drainage depressions and prior stream levees in the semiarid and arid zones of far western NSW.	Open chenopod Shrubland/ Sparse Chenopod Shrubland to 1m high.	*Near Threatened
154	**Pearl Bluebush low open shrubland of the arid and semi-arid plains** Dominated by Pearl Bluebush (*Maireana sedifolia*) often with a number of other bluebushes including Black Bluebush (*Maireana pyramidata*), *Maireana sclerolaenoides*, *Maireana erioclada*, *Maireana georgei* and *Maireana ciliata*. Bladder Saltbush (*Atriplex vesicaria*) and Thorny Saltbush (*Rhagodia spinescens*) are usually present. Tall shrubs are rare but may include various forms of *Senna artemisioides*. The ground cover is sparse and more so in drought. This community occurs on lime-rich red-brown loam or duplex sand/clay soils sometimes derived from limestone on rises on the plains in the semi-arid and arid zones of far western NSW In NSW it is most common in the Murray Darling Depression Bioregion with smaller stands elsewhere including to the north.	Open Chenopod Shrubland/ Sparse Chenopod Shrubland to 1-2m high.	*Near Threatened

Benson Vegetation Community ID	Vegetation Description	Structure	Threat Category* Conservation status in NSW#
155	**Bluebush shrubland on stony rises and downs of the arid zone** Mid-high open shrubland dominated several species of bluebushes but mainly Black Bluebush (*Maireana pyramidata*) with Pearl Bluebush (*Maireana sedifolia*) occurring in more calcareous sites. This community occurs on red or brown clays, calcareous red loams and skeletal soils derived from shales, ironstone and other substrates, often containing gibbers on undulating gibber plains, stony rises, adjoining slopes and associated drainage lines.	Open Chenopod Shrubland to 1-2m high.	*Near Threatened.
164	**Cotton Bush open shrubland of the semi-arid (warm) zone** Low to mid-high sparse to mid-dense shrubland dominated by Cotton Bush (*Maireana aphylla*) with occasional remnant shrubs of Bladder Saltbush (*Atriplex vesicaria sens lat*.). Smaller shrubs include copperburrs (*Sclerolaena muricata*, *Scleroleana tricuspis* and *Scleroleana bicornis*) and annual saltbushes (*Atriplex lindleyi*, *Atriplex leptocarpa*). The sparse ground cover contains native forbs such as paper daisies (*Rhodanthe spp.), Minuria cunninghamii*, and *Calotis scabiosifolia var. scabiosifolia* and grasses such as *Austrodanthonia caespitosa*. Occurs on grey to grey-brown clays or clay-loam soils on depressed alluvial plains mainly in the Riverina Bioregion of the semi-arid (warm) climatic zone. This is derived community occurring in highly disturbed areas.	Open Chenopod Shrubland/ Sparse Chenopod Shrubland, usually about 0.8m high.	Least Concern
165	**Derived corkscrew grass grassland/forbland on sandplains and plains in the semi-arid (warm) climate zone** Low to mid-high grassland, forbland or sparse shrubland dominated by native and exotic species with the species composition highly variable from place to place and depending on the seasons and rainfall. Native grasses include sickle shaped corkscrew grasses such as *Austrostipa scabra*, *Austrostipa nitida* or *Austrostipa nodosa* and in some locations *Aristida contorta*. Windmill Grass (*Chloris truncata*) may be common. Introduced grasses include *Hordeum leporinum* and *Bromus rubens*. Occurs on sandy loam or clay loam soils in drainage depressions, swales or plains on eolian dunefields, sandplains or higher alluvial plains in the semi-arid and arid climatic zones mainly in south western NSW. Some areas are possibly natural but others have probably been derived through heavy grazing disturbance of woody plant communities such as bluebush shrubland or *Casuarina pauper* woodland.	Open Forbland/ Open Grassland/ Sparse Chenopod Shrubland to 1-2m high.	*Least Concern
170	**Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones** Mallee woodland or open mallee shrubland dominated by several mallee species including White Mallee (*Eucalyptus dumosa*), Red Mallee (*Eucalyptus socialis*), Glossy-leaved Red Mallee (*Eucalyptus oleosa*) and Snap and Rattle (*Eucalyptus gracilis*). Chenopods shrubs form a major component of the understorey compared to mallee on sandy dunes (ID 171). This community occurs on calcareous red-brown, sandy-loam or loamy clay soils, sometimes containing limestone nodules, on eolian sandplains or in inter-dune plains or swales. Grades into sand dune mallee on sandy dunes, Black Oak-Belah-Western Rosewood communities on loamy soils and chenopod shrublands on loamy clay or clay soils.	Open Mallee Shrubland/ Open Mallee Woodland/ Mallee Woodland/ Mallee Shrubland, most usually about 8m high.	*Near Threatened.

Benson Vegetation Community ID	Vegetation Description	Structure	Threat Category* Conservation status in NSW#
171	**Spinifex linear dune mallee mainly of the Murray-Darling Depression Bioregion** Mallee shrubland or open shrubland, most often in a whipstick habit, dominated by a number of mallee species including White Mallee (*Eucalyptus dumosa*), Red Mallee (*Eucalyptus socialis*) and Snap and Rattle (*Eucalyptus gracilis*) and Ridge-fruited Mallee (*Eucalyptus costata*). This community contains a species-rich understorey that is dominated by Porcupine Grass (*Triodia scariosa*). A mid-dense to sparse shrub cover includes *Acacia colletioides*, *Dodonaea viscosa* subsp. *angustissima*, *Eremophila glabra*, *Olearia pimelioides*, *Maireana pentratropis*, and *Grevillea huegeilii*. The swales between the dunes are most often more loamy-clay and often contain different vegetation such as belah or box woodlands. This community occurs on calcareous brown-red sand or loamy sand sometimes overlying grey clay on east-west linear sand dunes mainly in the Murray-Darling Sands Bioregion in south far western plain of NSW.	Mallee Shrubland/ Open Mallee Shrubland usually 5m tall but can be up to 8m high.	*Least Concern
196	**Australian Boxthorn open shrubland** Mid-high open shrubland dominated by Australian Boxthorn (*Lycium australe*) with an understorey of chenopods and other saline-adapted species. Occurs on clay soils on clay pans and saline areas on playa plain landforms. Mainly restricted to south far western NSW in the Murray Darling Depression Bioregion and the semi-arid (warm) climate zones.	Open Shrubland; Sparse Shrubland to 2.5m high.	*Least Concern
199	**Hooked Needlewood - Needlewood - Mulga - Turpentine Bush open shrubland of the semi-arid and arid plains** Tall open shrubland dominated by Hooked Needlewood (*Hakea tephrosperma*) or Needlewood (*Hakea leucoptera*) that may dominate the stand or be present with Mulga (*Acacia aneura*) with a sparse shrub layer composed of Narrow-leaved Hopbush (*Dodonaea viscosa subsp. angustissima*) and Turpentine Bush (*Eremophila sturtii*). Occurs as small patches on red-brown sandy soil on old low dunes in far western plains of NSW.	Open Shrubland, usually 5m high.	*Near Threatened
221	**Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones** Mid-high open woodland dominated by Black Oak (*Casuarina pauper*) often with Western Rosewood (*Alectryon oleifolius subsp. canescens*) of mallee such as *Eucalyptus dumosa*. A sparse layer of tall shrubs may exist including Senna form taxon 'coriacea', Senna form taxon 'petiolaris' or *Exocarpos aphyllus*. The main understorey shrub is Pearly Bluebush (*Maireana sedifolia*) often with other species of bluebush including Black Bluebush (*Maireana pyramidata*) and *Maireana georgei*. This community occurs on calcareous sandy loam to light clay soils on the plains and sandplains of far south western NSW extending into South Australia. It grades into the more common ID58 to the east which has less or little Pearl Bluebush in the understorey.	Open Woodland averaging around 5-10m high.	*Near Threatened

Benson Vegetation Community ID	Vegetation Description	Structure	Threat Category* Conservation status in NSW#
252	**Sugarwood open woodland of the inland plains mainly Murray-Darling Depression Bioregion** Low open woodland dominated by Sugarwood (*Myoporum platycarpum*) as a subassociation in a broad plant community that is dominated by Inland Rosewood (*Alectryon oleifolius subsp. canescens*) and Black Oak (*Casuarina pauper*). A sparse layer of shrubs include chenopods such as the blue bushes *Maireana pentatropis*, *Maireana pyramidata*, *Maireana sedifolia* and *Maireana brevifolia*, *Chenopodium curvispicatum* and Bladder Saltbush (*Atriplex vesicaria sens lat*). Occurs on calcareous red to brown loam soils on sandplain and sand dune landforms of the arid and semi-arid (warm) climatic zones of far south-western NSW.	Open Woodland averaging around 6m high.	*Vulnerable

New South Wales - Vegetation of conservation significance

One vegetation community classified as an Endangered Ecological Community (EEC) under the NSW *TSC Act 1995*, *Acacia loderi* shrublands (Benson Community ID 128), was identified along the existing power line. Another vegetation community Slender Cypress Pine Woodland (Benson Community ID 21) was also noted along the route and is referable to the Sandhill Pine Woodland Preliminary Determination EEC. These two communities are discussed below.

Acacia loderi Shrublands EEC

The *Acacia loderi* Shrublands EEC was identified at a number of locations along the existing power line and covers approximately 1.8% of the total power line length. Table 4-2 lists the location, condition and approximate area within the study area of *Acacia loderi* Shrublands EEC identified during the field works.

Table 4-2 Location of Acacia loderi Shrublands EEC along the existing power line

GDA				
Easting	**Northing**	**Location**	**Approximate Area**	**Condition**
539726	6451001	West of CL[1]	20m x 20m	Poor
539977	6449885	15m East of CL	20m x 20m	Poor
541846	6442882	Around creek crossing	30m x 20m	Poor
543114	6438160	30m East of CL	700m in length N-S	Moderate
543873	6435378	50m West of CL	Scattered	Poor
544092	6434632	140m East of CL	Large community 2-3 hectares	Good
544900	6431599	0-120m West of CL	Approx 300m in length N-S	Moderate
545299	6430073	0-50m East of CL	Approx 60m in length N-S	Poor
545368	6429789	East and West of CL	Mostly to the East of CL	Poor (impacted by fire)
545398	6429673	150m East of CL	Extensive area	Good
545494	6429298	on CL	1 ha, good regeneration (suckering)	Good regeneration
545739	6428351	East and West of CL	Scattered	Poor
546218	6426541	0-20m East and West of CL	Approx 60m in length N-S	Poor
546300	6426229	10-50m East of CL	Approx 50m in length N-S	Poor
546489	6425533	10-50m West of CL	2 hectares	Moderate
546932	6423865	50m East of CL	Quarter hectare	Moderate
549123	6401443	East and West of CL	Mostly to the East approx 100m from CL. Approx 300m in length N-S	Moderate
550386	6392712	on CL	Approx 50m in length N-S	Poor
550347	6392304	50m West of CL	half hectare	Poor
550259	6391388	100m East of CL	2 hectares	Moderate
550113	6389829	120m West of CL	Approx 50m in length N-S	Poor
549961	6388331	30m West and 120m East of CL	1ha (west) and 2ha (east)	Mod-Good
549911	6387814	100m East of CL	1 hectare	Moderate

[1] Centre line of existing easement

GDA		Location	Approximate Area	Condition
Easting	**Northing**			
555948	6336204	East and West of CL	Very old significant remnant >10ha	Very Good
556051	6335829	East and West of CL	Extensive area, very old and tall	Very Good

Sandhill Pine Woodland Preliminary EEC

The Scientific Committee, established by the TSC Act, has made a Preliminary Determination to support a proposal to list Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions as an EEC on Part 3 of Schedule 1 of the Act. Public exhibition of the EEC was completed on the 14 September 2007 and is awaiting final determination by the Scientific Committee. The Slender Cypress Pine Woodland described by Benson *et al*. (2006) (Vegetation Community ID 21) and identified along the existing power line is referrable to this EEC (NSW DECC website 2008). Table 4-3 lists the location and condition of Slender Cypress Pine Woodland identified during the field works. It should be noted that this community was observed along sandy rises which run in an east-west direction across the existing power line. Hence the lateral extent of the vegetation community was difficult to determine. The majority of the remnants are in poor condition and the presence of numerous stumps (Appendix E, Photo 5) indicates that the community has been subjected to logging in the past.

Table 4-3 Location of Slender Cypress Pine Woodland along the existing power line

GDA		Location	Condition
Easting	**Northing**		
560438	6309240	East and West of CL [2] along ridge	Good
560565	6307506	West of CL along ridge	Good
560789	6304444	East of CL along ridge	Poor
570746	6279732	Mainly East of CL	poor-mod
571106	6279206	Scattered areas along ridgelines between Belah woodland,	mostly poor
586194	6261261	West of CL	poor
593684	6252595	Scattered areas along ridgelines between Blackbox woodland,	poor
611228	6231816	West of CL along ridge	poor
614262	6228038	East and West of CL along ridge	poor

Three other communities noted along the existing power line have been identified by John Benson *et al.* (2006) as being vulnerable based on the present extant and their lack of representation in protected areas, including:

[2] Centre line of existing easement

- Community 13 (Blackbox - Lignum Woodland of the inner floodplains);
- Community 139 (Prickly Wattle Shrubland); and
- Community 252 (Sugarwood Open Woodland).

These communities are currently not listed under the *TSC Act* or the *EPBC Act*.

Noxious Weeds in New South Wales

Two weeds declared under the *Noxious Weeds Act 1993* were recorded within the study area. African Boxthorn is listed under Class 4 for Broken Hill LGA, Wentworth LGA and the Western Division; the control objective for Class 4 weeds is to minimise the negative impact of those plants on the economy, community or environment of New South Wales. Mesquite is listed under Class 2 for these same areas and is recognised as a weed of national significance. The control objective for Class 2 weeds is to eradicate the plant from the land and keep the land free of the plant.

Table 4-4 Location of Noxious Weeds identified during the field works

GDA		Noxious Weed	Location
Easting	Northing		
538508	6456084	Mesquite	Around Kelly's Creek
538731	6454945	Mesquite and African Boxthorn	Small creekline
539107	6453839	Mesquite	Small run-on area
541390	6444615	African Boxthorn	Around pilon X2-667
544447	6433306	African Boxthorn	
546407	6425838	African Boxthorn	
547348	6422325	African Boxthorn	
547675	6419344	African Boxthorn	Scattered through Pine Creek
547754	6419231	Mesquite	in creekline
549014	6406173	African Boxthorn	run-on area
616660	6208790	African Boxthorn	East and West of CL, large infestation around dam and cleared area.

Victoria

Approximately 1.3km of the proposed power line would occur within the Robinvale Plains Bioregion of Victoria. The existing power line crosses through the King's Billabong Wildlife Reserve which is a conservation reserve managed by Parks Victoria and the DSE. Three Ecological Vegetation Classes (EVC's) were identified along this section of the power line and are described in Table 4-5, below. Vegetation descriptions and structure, including height, have been adapted from the DSE website.

Table 4-5 Description of vegetation communities identified within the study area in Victoria

* Bioregional Conservation Status, according to DSE Victoria, is based on pre-European extent, current extent and representation in protected areas.

EVC Number	Vegetation Description	Structure	Bioregional Conservation Status*
EVC103	**Riverine Chenopod Woodland** Eucalypt woodland with a diverse shrubby and grassy understorey occurring on most elevated riverine terraces. Confined to heavy clay soils on higher level terraces within or on the margins of riverine floodplains (or former floodplains), naturally subject to only extremely infrequent incidental shallow flooding from major events if at all flooded.	Open Woodland to 15m tall.	Depleted
EVC104	**Lignum Swamp** Typically treeless shrubland, with robust (but sometimes patchy) growth of lignum. Widespread wetland vegetation community in low rainfall areas on heavy soils, subject to infrequent inundation resulting from overbank flows from rivers or local runoff.	Shrubland to 4m tall.	Vulnerable
EVC106	**Grassy Riverine Forest** Occurs on the floodplain of major rivers, in a slightly elevated position where floods are infrequent, on deposited silts and sands, forming fertile alluvial soils. River Red Gum forest with a groundlayer dominated by tussock-forming graminoids. Occasional tall shrubs present.	Forest to 25m tall.	Depleted

Victoria - Vegetation of conservation significance

One community identified within Victoria (EVC104) in the easement has a Bioregional Conservation Status (BCS) of vulnerable. This status, determined by the DSE, takes account of how commonly it originally occurred, the current level of depletion and the level of degradation of condition typical of remaining stands (VIC DSE website 2008). However, this community is not listed as a Threatened Community under the *Flora and Fauna Guarantee Act 1988*.

No noxious weeds were found in the Victorian section of the route.

4.2. Fauna habitat attributes

4.2.1. Stage 2: turbine envelope

Analysis of the aerial photography for Stage 2 indicates that habitat types identified within the Stage 1 envelope are similarly present within the Stage 2 envelope. These include four general habitat types:

1. Rocky outcrops and ridges,
2. Woodland and grassland slopes,
3. Plains,
4. Ephemeral drainage lines.

Additional habitat features are likely to include hollow-bearing trees and mature vegetation, mine shafts and caves. These habitats and habitat features are discussed briefly below.

Rocky outcrops and ridges

Rocks and crevices provide a large variety of refuge for reptiles and mammals. Several threatened fauna likely to occur in the area are dependant on this resource. It is likely that the larger outcrops will be preferred sites for goat occupation with subsequent degradation of vegetation and fauna habitat expected. The distinct ridges, particularly where bordering plains habitat is likely to be preferred habitat for raptors such as the Wedge-tail Eagle, making use of updrafts and roost sites.

Shrublands

Trees appear to be sparse over most of the site. In more sheltered landscape positions (lower slopes and south facing slopes), more dense concentrations of Mulga trees are expected to provide roosting and nesting habitat for birds and bats. Large areas of tree die back are expected across the study area. These areas provide limited habitat to native fauna.

Hummock grasslands

Spinifex grassland was found to be distributed predominantly in the lower two-thirds of the study area. A lateral band extends from the Stage 1 area into the Stage 2 area. Its distribution appears patchy and over smaller areas within Stage 2. Dead and live spinifex clumps provide important refuge for small reptiles and potentially mammals. Several threatened fauna likely to occur in the area are dependant on this resource.

Plains

The plains are likely to contain low ground cover, shrubs and trees of very sparse density. Fauna habitat is expected to be limited in these areas with rocks and fallen timber potentially providing refuge for ground-dwelling reptiles and mammals.

Watercourses and wetlands

Umberumberka Dam provides the only source of permanent water within close proximity of the site. It is an artificial structure constructed in 1915, covering 145 hectares and capable of storing nine mega litres. Ephemeral creeks are present within the envelope and are likely to provide free water and moist seeps for some time following larger rainfall events. They also contain large hollow-bearing trees, increasing the value of this fauna habitat as a refuge and source of water. Ephemeral drainage lines are also present in gullies (including extensive gorges such as Lords Gorge) and incised plains.

Hollow-bearing and mature trees

Large hollows are likely to be concentrated in mature River Red Gums growing within the major drainage lines. Species requiring large hollows (including owls, arboreal mammals and colonial bats) will be dependant on these areas for refuge. Smaller hollows are likely in Mallee vegetation on ridges and slopes, suitable refuge for woodland birds and bats. The degree of exposure to strong winds may lessen the value of these hollows in certain ridge and upper slope locations, particularly on westerly facing slopes where exposure to strong, hot and dust laden winds is greater.

Mine shafts and caves

The area has a history of mining use. Shafts as well as small caves and overhangs are likely. These sites can provide refuge for microbats. The site is subject to

extremes of temperature increasing the importance of thermoregulation for bats (and reptiles).

These above habitats have been identified as playing an important role in sustaining native fauna populations in the area and impact on these habitats will need to be considered in the development of Stage 2. A key impact documented within the Stage 1 area in the comprehensive biodiversity assessment (nghenvironmental 2008) and also observed within the Stage 2 area is degradation of all vegetation communities by feral goat grazing. Sites visits suggest that feral goats have contributed to the disturbance of all of the vegetation communities within Stage 2 , as was found in Stage 1. The grazing of goats on many semi arid zone plant species has been found to have a deleterious effect and this species has played a leading role in the cessation of regeneration of key species such as Mulga (Benson *et al* 2006). When both rabbit and goat populations occupy the same area the combined effect of the grazing habits of both species has been found to almost totally inhibit plant regeneration on a broad scale (Auld 1993).

The key constraints at Stage 1 were the distribution of spinifex grassland and rocky outcrops. These areas provide habitat for several threatened species found in Stage 1 including Marble-headed Snake-lizard and Slender Mallee Blue-tongue Lizard, found in spinifex on rocky ridges, and the Tawny Rock Dragon, found in crevices within rocky ridges. These features have been mapped for Stage 2 using aerial photography and are included as Appendix A. An opportunity exists to improve the condition of vegetation within the Stage 2 turbine envelope, through the management of goat grazing.

4.2.2. Power line route

No fauna surveying has been undertaken for the power line route however, fauna recorded incidentally during the power line field assessment included:

Nankeen Kestrel

Common Wallaroo

Pink Cockatoo (listed as Vulnerable in NSW, recorded at E553522, N6343381)

Mulga Parrots

Peregrine Falcons (many nests in existing power line towers)

Additionally, good potential habitat for Mallee Fowl, listed as Endangered in NSW and Vulnerable nationally, was observed between:

- E557045, N6332082 and E557719, N6329184 (very mature mallee abundant), and
- E603347, N6241224 and E606482, N6237529

4.3. Threatened species

Searches of threatened species databases were undertaken for the entire area, including the Stage 2 envelope and the power line route. Additionally field assessment enabled validation of vegetation mapping over the power line route. The results are discussed below.

4.3.1. Field assessment: powerline route

One threatened species as listed under the *Threatened Species Conservation Act 1995* was identified along the existing power line during the fieldworks. Bitter Quandong (*Santalum murrayanum)* was identified at the following locations on the powerline route:

Table 4-6 Location of Threatened flora species identified during the field works

From (GDA)		To (GDA)		Number of Individuals	Location
Easting	**Northing**	**Easting**	**Northing**		
603654	6240841	603654	6240841	1	10m West of CL
617714	6212199	617658	6212170	Approx 7	West of CL, smaller individuals suckering off a larger tree
617691	6212125	617686	6212125	Approx 4	West of CL
617750	6212134	617751	6212117	Approx 3	East of CL
617031	6210018	617017	6210014	Approx 4	West of CL

Two other species *Sarcozona praecox* and *Eremophila divaracata* were identified along the existing power line within Victoria and are classified as rare (pers. comm. Ian Sluiter November 2007).

4.3.2. Desktop assessment: Stage 2 and powerline route

EPBC Act Protected Matters Reports, Bionet and DECC Wildlife Atlas searches were generated which cover the Stage 2 turbine envelope and the powerline route. These are included in Appendix D.

Considering the assessment of the Stage 1 envelope and the similar nature of the works proposed, the following species would require consideration in a more detailed assessment of biodiversity impacts.

Table 4-7 Threatened species requiring further consideration

These species were identified as having moderate to high potential for impact within the Stage 1 turbine envelope (nghenvironmental 2008) and would similarly require evaluation for within Stage 2.

Flora:	
Purple-wood wattle	Yellow-keeled swainsona
Silver wattle	Slender darling pea
Saltbush	Creeping darling pea
Dysphania platycarpa	Showy indigo
Spike-rush	
Birds	
Thick-billed Grasswren	Rufous Fieldwren
Pink Cockatoo	Scarlet-chested Parrot
Pained Honeyeater	Pied Honeyeater
Rainbow Bee-eater	White-throated Needle-tail
Barking Owl	Masked Owl
Black-breasted Buzzard	Square-tailed Kite
Australian Bustard	Grey Falcon
Mammals	

Little Pied Bat	Inland Forest Bat
Kultarr	Forrest's Mouse
Stripe-faced Dunnart	Yellow-bellied Sheathtail-bat
Sandy Inland Mouse	
Reptiles	
Tawny Rock Dragon	Slender Mallee Blue-tongue Lizard
Ringed Brown Snake	Marble-headed Snake-lizard
Woma	

Additional evaluation is required to consider thoroughly the potential for impact on all species listed as threatened with potential to occur within Stage 2 and powerline route works areas.

5. KEY CONSTRAINTS

This report identifies from field work and desktop assessment, the likely biodiversity constraints for the development of the Stage 2 turbine envelope and the power line route from Broken Hill to Red Cliffs. Further investigation will be required in several areas. A Biodiversity Assessment with a field work component would be required to address the specific issues discussed below.

5.1. Vegetation

5.1.1. Stage 2: turbine envelope

Further investigation will be required to determine if additional vegetation communities occur in the development envelope. It is likely that the vegetation community recently named *Porcupine grass – red mallee – gum coolibah hummock grassland / low sparse woodland* will place some constraint on the location of infrastructure. It is has been mapped from aerial imagery within the Stage 2 envelope (Appendix A) and will require ground validation in a more detailed assessment which considers the condition of this vegetation. Similarly, the EEC *Acacia loderi Shrublands*, may occur within the Stage 2 envelope and will require field surveys and a more detailed assessment.

Based on available information, these areas are not likely to be extensive on site and are therefore considered to be a manageable constraint. Pending additional assessment, potential mitigation measures for EECs and other native vegetation on site may include:

- Pegging or otherwise delineating the boundaries of the EECs and avoiding direct and indirect impacts in these areas.
- Siting infrastructure to minimise clearing.
- Treating weed infestations in areas that would be disturbed by works prior to commencing works.

5.1.2. Power line route

Validation of vegetation mapping on the power line route indicated that the DECC vegetation mapping along the route is for the most part accurate, although field assessment was able to identify more subtle transitions of vegetation communities. On the basis of this assessment, areas of EEC have been identified (*Acacia loderi Shrublands* and the soon to be listed *Slender Cypress Pine Woodlan*d). Where this vegetation is in good condition, significant impact should be avoided. Mitigation measures that aim to ensure the integrity of the community is not adversely affected will be required.

Potential mitigation measures may include:

- Pegging or otherwise delineating the boundaries of the EECs and avoiding or minimising direct and indirect impacts in these areas. This may require the repositioning of power line footings or minor alterations to the route to avoid these vegetation communities.
- Design solutions. These may include investigating if the height of the power line structure over EECs is sufficient to allow minimal impact on these communities.
- In sensitive areas, easement vegetation maintenance protocols may be required to ensure that the ongoing maintenance of the power line easement has minimal impact on the integrity of the vegetation in the easement.

- Offsetting the clearing required for the power line route may be required. In NSW, this is usually done on a 'like for like' basis. That is, the amount of vegetation in each vegetation community to be cleared needs to be reflected in the areas deemed to be offset areas.

There would be benefits from restricting grazing to the EECs in good condition. If such a measure could be incorporated into the proposal, this would represent an opportunity to offset other environmental impacts.

5.2. Fauna habitat attributes

5.2.1. Stage 2: turbine envelope

It is likely that habitat features important in Stage 2 will be similar to those identified in Stage 1. Further investigation in field surveys will be required however, it is considered that impacts to fauna habitat should be manageable with the effective implementation of mitigation measures.

Key features are likely to include rocky outcrops and ridges, spinifex grasslands, ephemeral drainage lines, hollow-bearing trees and mature vegetation, mine shafts and caves. Impact to these features can be managed by:

- Pegging or otherwise delineating the locations of these features and avoiding direct and indirect impacts in these areas. This may require the repositioning of some infrastructure.

5.2.2. Power line route

Field assessment of the power line route identified several features of value to native fauna. These areas should be avoided or works managed to avoid significant adverse impact to these areas. Impact to these features can be managed by:

- Pegging or otherwise delineating the locations of these features and avoiding direct and indirect impacts in these areas. This may require the repositioning of some infrastructure.

5.3. Threatened species

5.3.1. Stage 2: turbine envelope

The assessment of key fauna habitat attributes for Stage 2 and the power line route has been primarily desktop-based. One of the assumptions of the assessment is that the key constraints in Stage 1 are also likely to be constraints in Stage 2. On that basis, several threatened species are considered to have the potential to occur within the Stage 2 envelope and will require field surveys as part of a more detailed assessment. These include:

Flora:

Purple-wood wattle	Yellow-keeled swainsona
Silver wattle	Slender darling pea
Saltbush	Creeping darling pea
Dysphania platycarpa	Showy indigo
Spike-rush	

Birds	
Thick-billed Grasswren	Rufous Fieldwren
Pink Cockatoo	Scarlet-chested Parrot
Pained Honeyeater	Pied Honeyeater
Rainbow Bee-eater	White-throated Needle-tail
Barking Owl	Masked Owl
Black-breasted Buzzard	Square-tailed Kite
Australian Bustard	Grey Falcon
Mammals	
Little Pied Bat	Inland Forest Bat
Kultarr	Forrest's Mouse
Stripe-faced Dunnart	Yellow-bellied Sheathtail-bat
Sandy Inland Mouse	
Reptiles	
Tawny Rock Dragon	Slender Mallee Blue-tongue Lizard
Ringed Brown Snake	Marble-headed Snake-lizard
Woma	

Additional evaluation is required to consider thoroughly the potential for impact on all species listed as threatened with potential to occur within the works area however, based on a similar assessment in Stage 1, it is likely that impacts on threatened species will be manageable. Pending the results of further investigation, mitigation measures may include:

- Pegging or otherwise delineating the boundaries of quality potential habitat for these species and avoiding or mitigating direct and indirect impacts in these areas.
- Pegging or otherwise identifying the location of key habitat features, such as caves or large hollow-bearing trees, to be retained and protected from direct and indirect impacts or minimise the impact of these.
- Ensuring weed and sediment erosion controls are implemented to prevent onsite habitat degradation during and following the proposed works. Ensuring all areas of disturbed soil are rehabilitated progressively as soon as practicable after disturbance, in order to resist erosion and colonisation by weeds.
- Habitat modification may need to be undertaken to reduce the attractiveness of the site to foraging raptors. Goats are likely to require a control program. Water points may need to be relocated, if present close to the turbines.
- An adaptive management monitoring program will be required to document collision mortalities, remove carcasses and assess the effectiveness of controls. Timing should be specific to the most at-risk target species. Standardised and publicly available data should be collected to increase the knowledge base on this subject. If mortalities exceed a pre-determined threshold (set out in the monitoring program), additional mitigation measures should be considered, such as turbine ridge habitat modification and enhancement of off-site habitats.

The link between goat grazing and the degradation of native vegetation and threatened species habitat has been well established (Benson *et al* 2006; Auld 1993; DNR 2005; Murphy 1996; NSW NPWS 2000). There is an opportunity to manage their impact within the

study area to improve the condition of native vegetation and the quality of fauna habitat. The implementation of a feral goat management program as part of the development of the wind farm site would assist in offsetting environmental impacts and halt the degradation that heavy goat grazing is causing across many areas of the site.

5.3.2. Power line route

Additional evaluation is required to consider thoroughly the potential for impact on all species listed as threatened with potential to occur within the works area.

Based on the nature and scale of the works proposed, it is likely that impacts on threatened species will be manageable with the implementation of mitigation measures. Pending the results of further investigation, mitigation measures may include:

- Pegging or otherwise delineating the boundaries of quality potential habitat for threatened species avoiding or minimising direct and indirect impacts in these areas.
- Pegging or otherwise identifying the location of key habitat features to be retained and protected where possible from direct and indirect impacts.
- Ensuring weed and sediment erosion controls are implemented to prevent onsite habitat degradation during and following the proposed works. Ensuring all areas of disturbed soil should be rehabilitated progressively as soon as practicable after disturbance, in order to resist erosion and colonisation by weeds.
- Design solutions. Power poles should be designed to minimise perching and roosting opportunities where possible.

6. CONCLUSION

This *Biodiversity Constraints Report* has identified the likely key flora and fauna constraints of the proposed Silverton Wind Farm: Stage 2 and the power line from Broken Hill to Red Cliffs.

Key constraints include avoiding or minimising impacts to EECs in good condition, minimising clearing of other native vegetation, minimising impact to fauna habitat attributes and to threatened species of flora and fauna. Based on desktop assessment, extrapolation of information obtained in a comprehensive investigation of the Stage 1 area and a field survey of the power line route, these results indicate that impacts are able to be managed with the implementation of mitigation measures.

Further investigation will be needed to validate the desktop assessments, evaluate all threatened species with potential to be adversely affected and refine the mitigation measures.

There is an opportunity to address the impact of goat grazing as part of the development, with resultant benefits for the condition of native vegetation and native fauna habitat. Implementation of a feral goat management program as part of the development of the wind farm would assist in offsetting environmental impacts and halt the degradation that heavy grazing is causing across many areas of the turbine envelope and some sections of the power line route.

7. REFERENCES

Auld, T.D. (1993). 'The impact of grazing on regeneration of the shrub Acacia carnei in arid Australia'. Biological Conservation 65: 165–76

Benson JS, Allen, CB, Togher C, Lemmon J (2006). New South Wales vegetation classification and assessment. Part 1 Plant communities of the NSW western plains. Cunninghamia 9, 383-450.

Department of Natural Resources (2005) Native Vegetation in the Western Division. Fact Sheet No. 14. http://www.nativevegetation.nsw.gov.au/fs/fs_14h.shtml

Hodos, W., A. Potocki, T. Storm, & M, Gaffney. 2001. Reduction of motion smear to reduce avian collisions with wind turbines. Pp. 88-105. In S. S. Schwartz, (ed.) Proceedings of the National Avian- Wind Planning Meeting IV. Prepared for the Avian Subcommittee of the National Wind Coordinating Committee by RESOLVE, Inc. Washington, DC.

Murphy, M.J. (1996). A possible threat to the Broad-headed snake Hoplocephalus bungaroides: degradation of habitat by the feral goat Capra hircus. Herpetofauna 26(2).

New South Wales Department of Environment and Climate Change website 2008 www.environment.nsw.gov.au

New South Wales National Parks and Wildlife Service (2000). Centralian Ranges Rock-skink (Egernia margaretae) Recovery Plan. NSW National Parks and Wildlife Service.

New South Wales National Parks and Wildlife Service (2003) The Bioregions of New South Wales: their biodiversity, conservation and history, NSW National Parks and Wildlife Service, Hurstville.

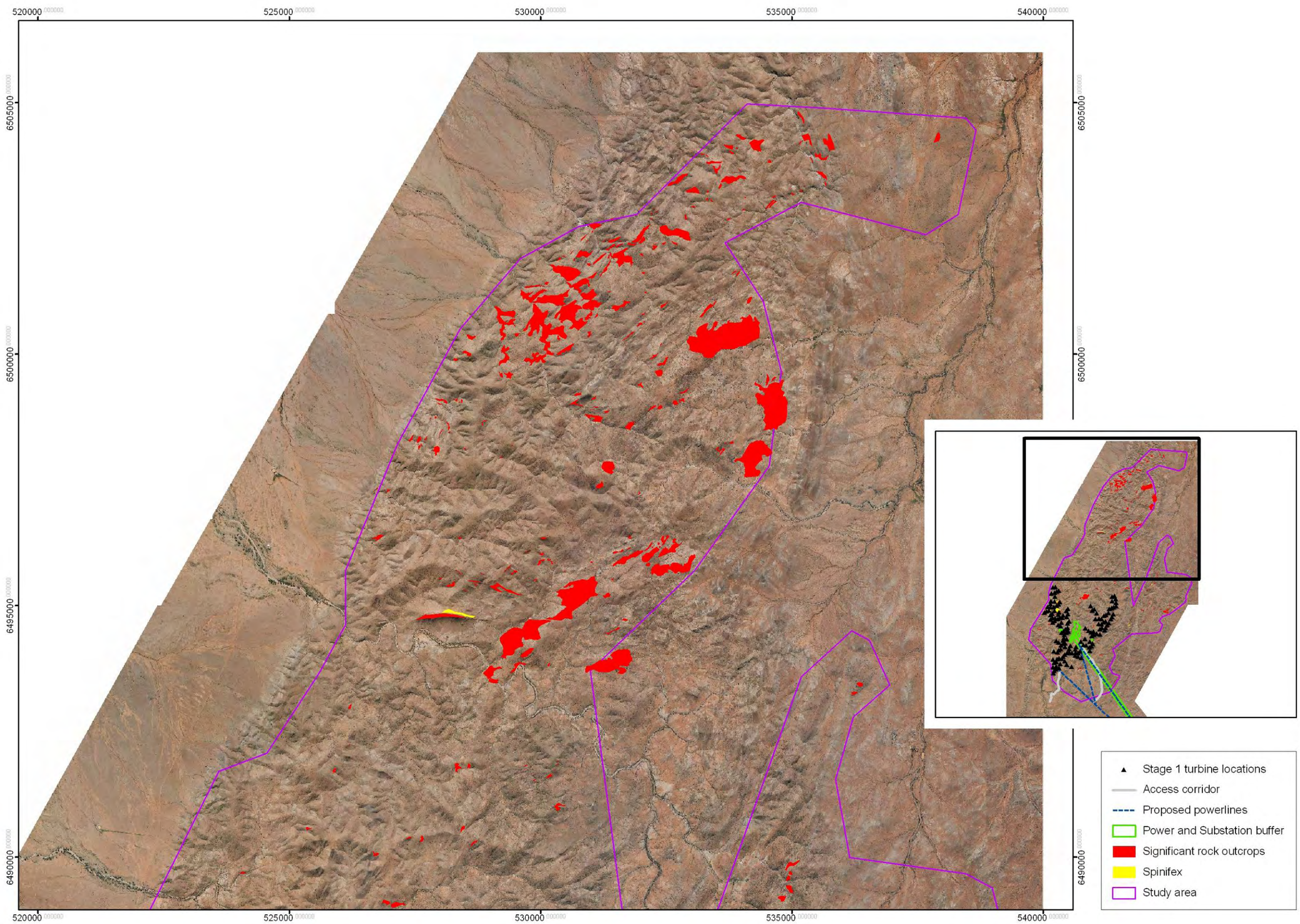
nghenvironmental 2008, Proposed development of Stage 1, Silverton Wind Farm, western New South Wales: Draft Biodiversity Assessment. Report prepared for Silverton Wind Farm Pty. Ltd J.V.

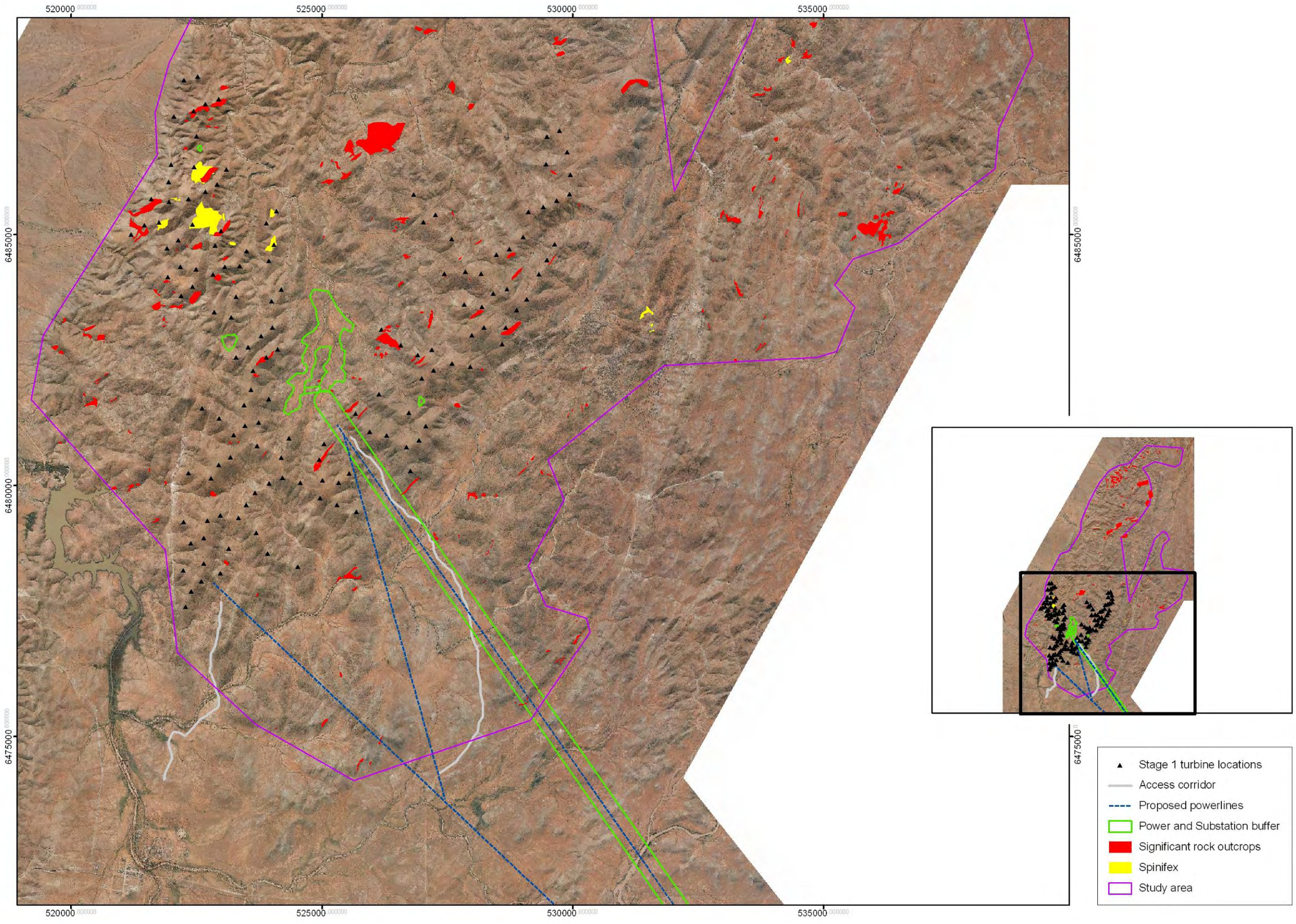
Victoria Department of Sustainability and the Environment website 2008 www.dse.vic.gov.au

APPENDICES

APPENDIX A: STAGE 2 &3 CONSTRAINTS

Rocky outcrops and spinifex are considered to represent the greatest constraints within the Stage 2 turbine envelope. These have been mapped on the following pages. Further investigation will be required for these areas. Through avoidance and mitigation, potential impacts are considered to be manageable.


520000
525000
530000
535000
540000
6505000
6500000
6495000
6490000
Stage 1 turbine locations
Access corridor
Proposed powerlines
Power and Substation buffer
Significant rock outcrops
Spinifex
Study area


520000
525000
530000
535000
6485000
6480000
6475000
Stage 1 turbine locations
Access corridor
Proposed powerlines
Power and Substation buffer
Significant rock outcrops
Spinifex
Study area

APPENDIX B: POWER LINE KEY VEGETATION COMMUNITY CHANGES

Comparisons were made between the data collected in the field and the Forest Ecosystem layers produced by DECC for the study area. While there are some discrepancies between the two data sets, the Forest Ecosystem layers generally correspond to the vegetation communities identified along the power line easement. The following table includes a comparison between the DECC maps and the field observations and includes the condition of the vegetation assessed. The field observations were able to identify smaller changes in the vegetation communities that are not shown on the DECC maps such as areas of *Acacia loderi* Shrubland EEC, Sugarwood Woodland, Slender Cypress Pine Woodland and Prickly Wattle Tall Open Shrubland.

* Benson *et al.* (2006)

\# NSW DECC Forest Ecosystem layers

** Correlation between the field survey and the NSW DECC maps.

GDA		Benson Vegetation Community ID*	Field observations: Benson Vegetation Community Description*	Vegetation shown on DECC maps#	Match**	Condition	Additional Notes
Easting	Northing						
NEW SOUTH WALES							
539583	6460924	START					
539583	6460924	155 and 153	Bluebush shrubland	Maireana spp. Low shrubland/ low open shrubland	Yes	poor-good	
538508	6456084	11	River Red Gum Woodland	Eucalyptus camaldulensis (River Red Gum) open forest/woodland	Yes	poor	Scattered Acacia loderi (indiv). Mesquite around Kelly's Creek
538539	6455947	139	Prickly Wattle Tall Open Shrubland	Belah/rosewood woodland/open woodland	No	good	
538592	6455690	155,153 and 154	Bluebush/Pearl Bluebush Shrubland Mosaic	Mosaic of -Maireana spp. -mixed low open chenopod shrubland/annual herbland/grassland; and -Atriplex vesicaria (Bladder saltbush) low open shrubland	Yes	moderate-good	
539726	6451001	128	Neila Tall Open Shrubland	Not shown on Map	No	moderate	Acacia loderi Shrublands EEC

GDA		Benson Vegetation Community ID*	Field observations: Benson Vegetation Community Description*	Vegetation shown on DECC maps#	Match**	Condition	Additional Notes
Easting	**Northing**						
539810	6450605	155,153 and 154 (128)	Bluebush/Pearl Bluebush Shrubland Mosaic	Mosaic of -Maireana spp. -mixed low open chenopod shrubland/annual herbland/grassland; and -Atriplex vesicaria (Bladder saltbush) low open shrubland	Yes	moderate-good	Scattered areas of *Acacia loderi* shrublands EEC
541909	6442674	164 and 154 (128)	Cotton bush/Pearl Bluebush Mosaic	Maireana spp. Low shrubland/ low open shrubland	Yes	poor-moderate	Scattered areas of *Acacia loderi* shrublands EEC
544182	6434252	58 and 153 (128)	Bluebush Shrubland/Belah Rosewood Woodland Mosaic	Maireana spp. and mixed low open chenopod shrubland.	Yes-No	moderate	Scattered areas of *Acacia loderi* shrublands EEC
547675	6419344	11	River Red Gum Woodland	Eucalyptus camaldulensis (River Red Gum) open forest/woodland	Yes	poor-moderate	African boxthorn and mesquite around Pine Creek
547655	6419084	153 and 164	Bluebush/Cottonbush Mosaic	Mosaic of -Maireana spp. -mixed low open chenopod shrubland/annual herbland/grassland; and -Atriplex vesicaria (Bladder saltbush) low open shrubland	Yes	poor-good	
549167	6404603	154, 153, 58 and 221(128)	Pearl Bluebush/Black Bluebush/Belah Rosewood woodland Mosaic	Mosaic of Maireana spp. and Casuarina pauper	Yes	moderate-good	Scattered areas of *Acacia loderi* shrublands EEC
550804	6371044	171, 170 and 58	Triodia Mallee/Mallee Sandplain/Belah Rosewood woodland Mosaic	Mosaic of Eucalyptus spp. with Trodia understorey and shrubby understorey and mixed low open chenopod shrubland	Yes	good	
551945	6360876	119	Mulga woodland	Maireana spp. low shrubland	No	moderate	
552008	6360479	Undescribed	Callitris glaucophylla with Triodia understorey	Maireana spp. low shrubland	No	moderate-good	Undescribed Vegetation Community
552031	6360301	15	Blackbox woodland/Open Grassland Mosaic	Blackbox open woodland	Yes	moderate	
552159	6359395	Undescribed	Callitris glaucophylla with Triodia understorey	mixed low open chenopod shrubland	No	moderate-good	Undescribed Vegetation Community

GDA		Benson Vegetation Community ID*	Field observations: Benson Vegetation Community Description*	Vegetation shown on DECC maps#	Match**	Condition	Additional Notes
Easting	Northing						
552275	6358562	171 and 165	Triodia Mallee/Derived Grassland Mosaic	Mosaic of Eucalyptus spp. tall shrubland with shrubby understorey and grassland	Yes	poor-moderate	
552897	6354254	58, 171 and 170	Belah Rosewood Woodland/Triodia mallee/Sandplain Mallee Mosaic	Mosaic of Maireana spp. and Eucalyptus spp tall shrubland and Dodonaea spp	Yes-No	moderate-good	
552401	6346429	170 and 171	Sandplain mallee/Triodia mallee mosaic	Mosaic of Eucalyptus spp tall shrubland with Triodia understorey and shrubby understorey.	Yes	good	
555948	6336204	128	Neila Tall Open Shrubland	Eucalyptus spp tall shrubland	No	good	Very significant patch of *Acacia loderi* Shrublands EEC
556117	6335586	171 and 170	Triodia Mallee/Sandplain Mallee Mosaic	Eucalyptus spp tall shrubland with shrubby understorey	Yes	very good	Area of very old mallee
558059	6327727	165	Derived Corkscrew Grassland	Mixed low open chenopod shrubland/grassland	Yes		
558200	6327104	252 and 58	Sugarwood Open woodland/Belah Rosewood Mosaic	Mosaic of Maireana spp. and Eucalyptus spp tall shrubland and Dodonaea spp	No	good	
559561	6321277	58	Belah Rosewood Woodland	Mosaic of Maireana spp. and Eucalyptus spp tall shrubland and Dodonaea spp	No	moderate	
560438	6309240	58 and 21	Belah Rosewood Woodland/Slender Cypress Pine	Mosaic Casuarina pauper (belah), Eucalyptus spp tall shrubland and Maireana spp	Yes-No	moderate-good	Proposed Sandhill Pine Woodland EEC located along ridgeline (E-W)
560793	6304314	58	Belah Rosewood woodland (bluebush/pearlbluebush understorey)	Mosaic Casuarina pauper and Maireana spp	Yes	good	
562777	6291219	21	Slender Cypress Pine on sandy rises	Not shown on Map	No	poor-moderate	Proposed Sandhill Pine Woodland EEC located along ridgeline (E-W)
562853	6291120	58	Belah Rosewood woodland (bluebush/pearlbluebush understorey)	Maireana spp low shrubland	Yes	poor-moderate	
568637	6282716	15, 13 and 11	Blackbox woodland of outer floodplain/Backbox Woodland of inner floodplain/ River Red Gum Woodland	Blackbox open woodland	Yes	poor-moderate	

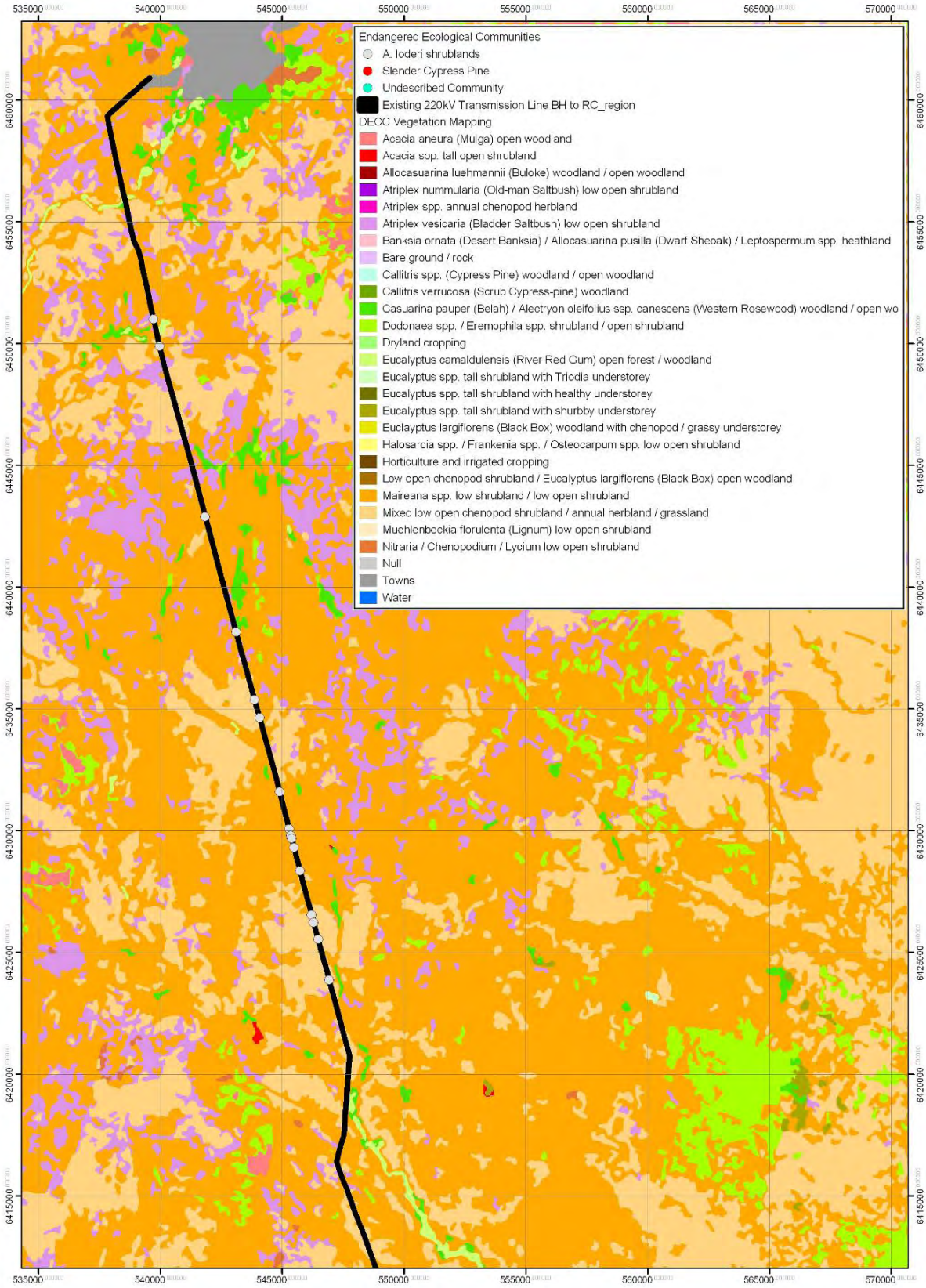
GDA		Benson Vegetation Community ID*	Field observations: Benson Vegetation Community Description*	Vegetation shown on DECC maps#	Match**	Condition	Additional Notes
Easting	Northing						
569013	6282244	58, 170, 21 and 171 (196)	Mosaic of Belah Rosewood/Sandplain Mallee/Slender Cypress Pine/Triodia Mallee. Small area of Aust Boxthorn	Mosaic of Maireana spp. and Eucalyptus spp tall shrubland and Dodonaea spp	Yes-No	poor-moderate	Proposed Sandhill Pine Woodland EEC located along ridgeline (E-W)
587537	6259675	15	Agricultural land (cropped) and Blackbox Woodland remnants	Dryland cropping	Yes	poor	
592319	6253359	11	River Red Gum Woodland	River Red Gum open forest	Yes	poor	
592490	6253311	15 and 139	Black Box Outer Terraces/Prickly Wattle Mosaic	Blackbox open woodland	Yes	moderate	
593539	6252772	15 and 21	Black box Woodland/Slender Cypress Pine Mosaic	Mosaic of Blackbox open woodland and Maireana spp	Yes	poor-moderate	Proposed Sandhill Pine Woodland EEC located along ridgeline (E-W)
598277	6247198	n/a	Agricultural land (cropped)	Not shown on Map	No		
598682	6246730	252 and 170	Mosaic Sugarwood Woodland/Sandplain mallee	Mixed low open chenopod shrubland	No	poor	
598842	6246530	170 and 21	Sandplain Mallee/Slender Cypress Pine Mosaic	Mosaic of Maireana spp and Eucalyptus spp with shrubby understorey	Yes-No	poor	Proposed Sandhill Pine Woodland EEC located along ridgeline (E-W)
599634	6245601	58 and 170	Belah Rosewood/Sandplain mallee Mosaic	Mosaic of Maireana spp and Eucalyptus spp with shrubby understorey	No	poor	
601036	6243935	124	Sandhill wattle Open shrubland	Not shown on Map	No	poor	
601158	6243813	171, 170 and 165	Triodia Mallee/sandplain Mallee/Derived Corkscrew Grassland Mosaic	Mosaic of Eucalyptus spp with Triodia and shrubby understorey.	Yes	poor at start then excellent	*Santalum murrayanum* (E1) at WP434. Very old mallee with good malleefowl habitat.
607685	6236111	58, 170 (165)	Belah Rosewood/Sandplain mallee Mosaic (some areas of derived corkscrew grassland)	Mosaic of Eucalyptus spp with Triodia and shrubby understorey.	Yes-No	good	
611228	6231816	58, 170, 21, 171 and 165	Mosaic of Belah Rosewood/Sandplain Mallee/Slender Cypress Pine/Triodia Mallee/derived grassland	Mosaic of Eucalyptus spp with Triodia and shrubby understorey.	Yes-No	moderate	Proposed Sandhill Pine Woodland EEC located along ridgeline (E-W)
615436	6226622	171 and 199	Sandplain Mallee/Hooked Needlewood mosaic	Not shown on Map	No	moderate	
615488	6226568	170, 165 and 58	Sandplain mallee/derived grassland/belah mosaic	Eucalyptus spp tall shrubland with shrubby understorey.	Yes	moderate	

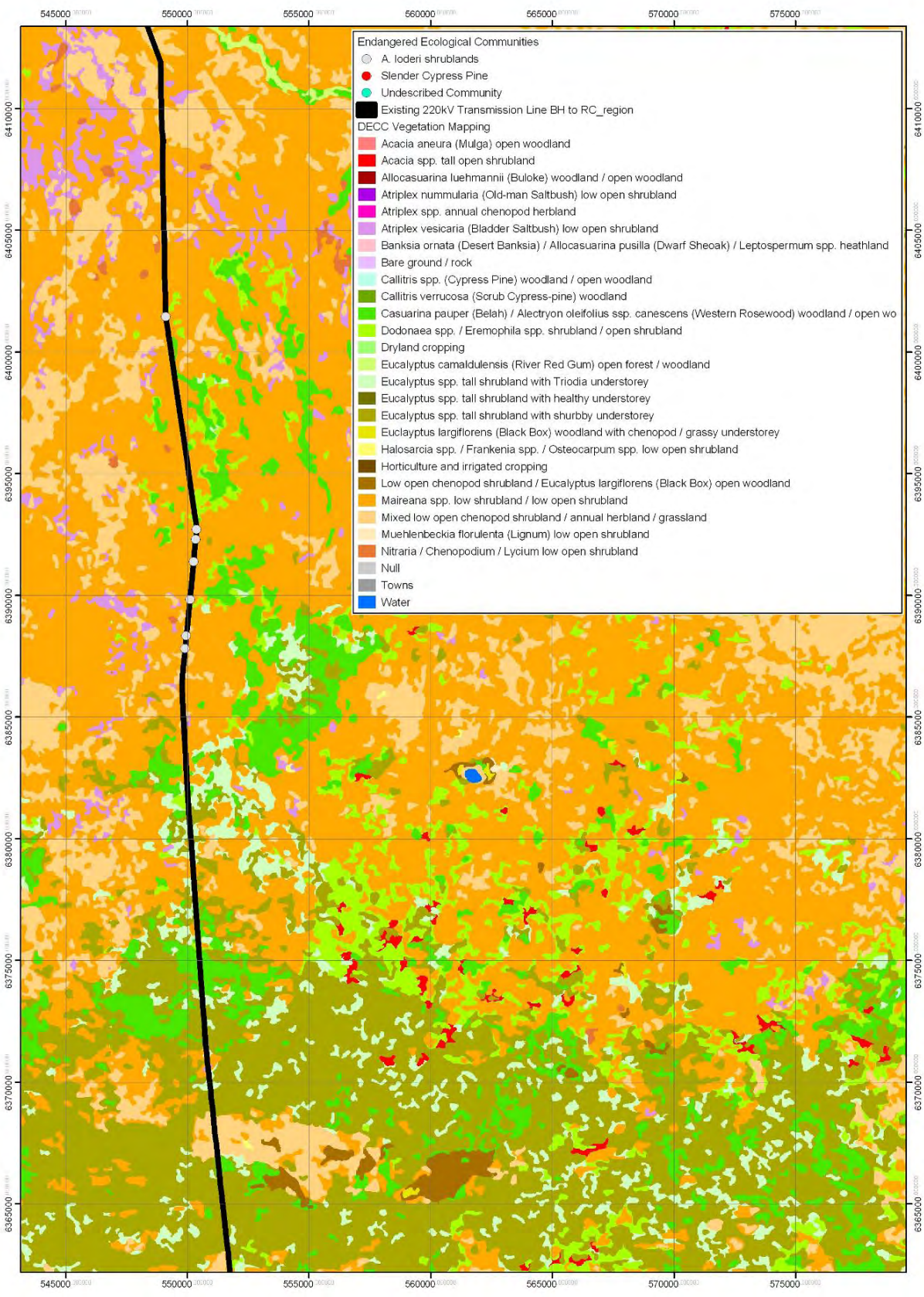
GDA		Benson Vegetation Community ID*	Field observations: Benson Vegetation Community Description*	Vegetation shown on DECC maps#	Match**	Condition	Additional Notes
Easting	**Northing**						
616124	6225786	n/a	Beronga substation	Not shown on Map	No	n/a	
616250	6225669	170,171 and 165	Sandplain mallee/Triodia mallee/Derived Grassland Mosaic	Mosaic of Eucalyptus spp tall shrubland with shrubby understorey, Casuarina pauper, Maireana spp.	Yes-No	poor-good	
619150	6216689	171 and 170	Triodia mallee/Sandplain mallee mosaic	Eucalyptus spp tall shrubland with shrubby understorey.	Yes	good-very good	*Santalum murrayanum* (E1) at W022-032; WP039-042.
616660	6208790	n/a	Cleared area, irrigation drainage basin	horticulture and irrigated cropping	Yes	n/a	Large area of african boxthorn around basin
616551	6208456	171	Agricultural land (cleared/cropped) Sturt Hwy (Sandplain mallee on road edges)	Dryland cropping	Yes	poor	
616051	6207187	15 (sections of 13)	Blackbox Woodland of outer floodplain/ cleared land	Blackbox open woodland	Yes	poor	
614901	6206120	11 (NSW) and EVC103(VIC)	River Red Gum Woodland	Not shown on map	No	poor	
VICTORIA							Murray River
614787	6205949	EVC104	Lignum Swamp	Not shown on Map	No	good	
614601	6205661		Ecotone Between Blackbox woodland and lignum swamp	Blackbox woodland	Yes	good	*Sarcozona praecox* (rare)
614566	6205602	EVC105	Blackbox woodland	Blackbox woodland	Yes	good	*Eremophila divaracata* (rare)
614320	6205220	EVC103	River Red Gum Woodland	Not shown on Map	No	good	Small creekline
614288	6205176	EVC105	Blackbox woodland	Blackbox woodland	Yes	good	
614075	6204866		Cleared land up to Substation	Not shown on Map	No	n/a	
614047	6204857		END				

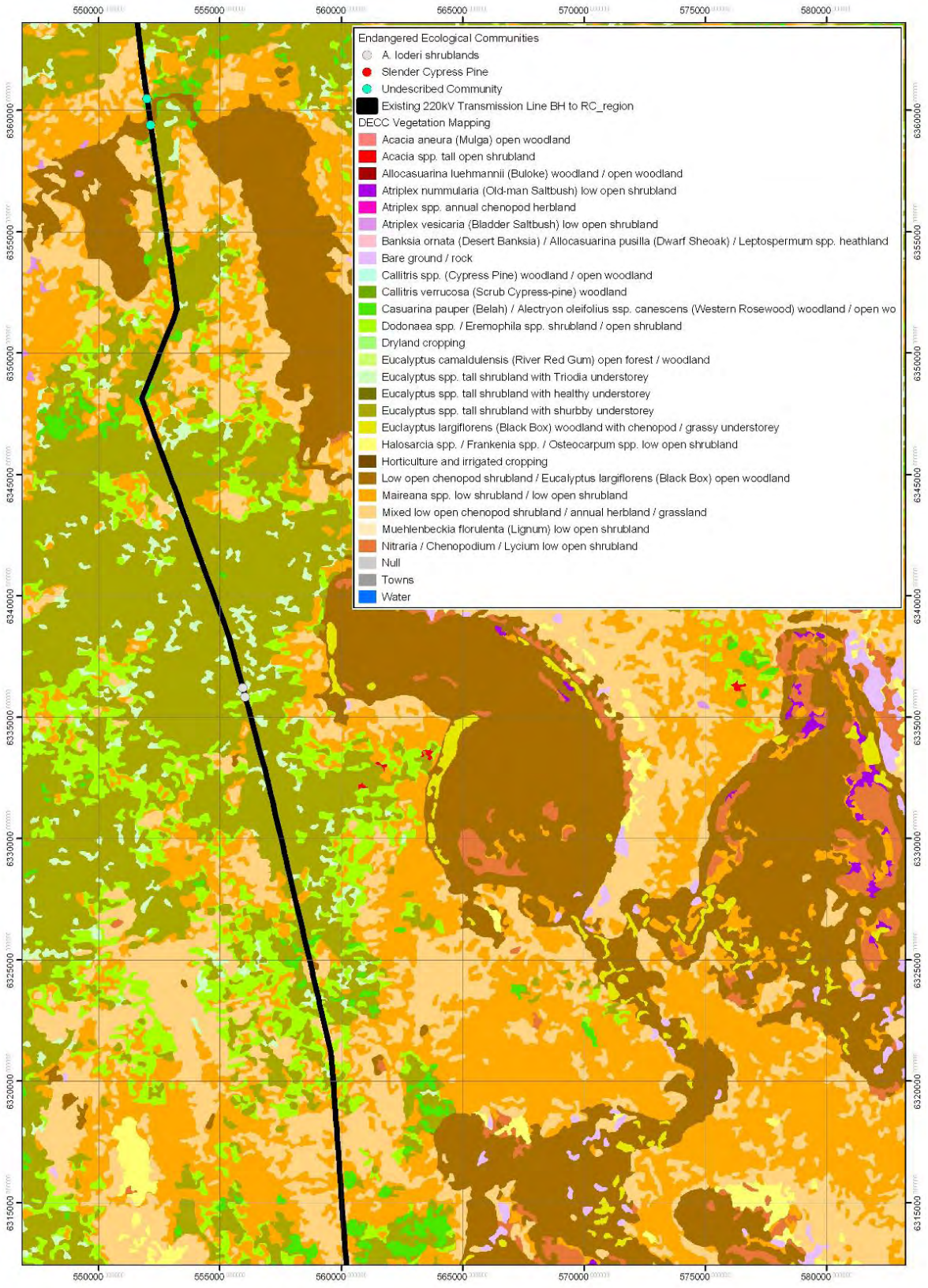
APPENDIX C: POWER LINE CONSTRAINTS

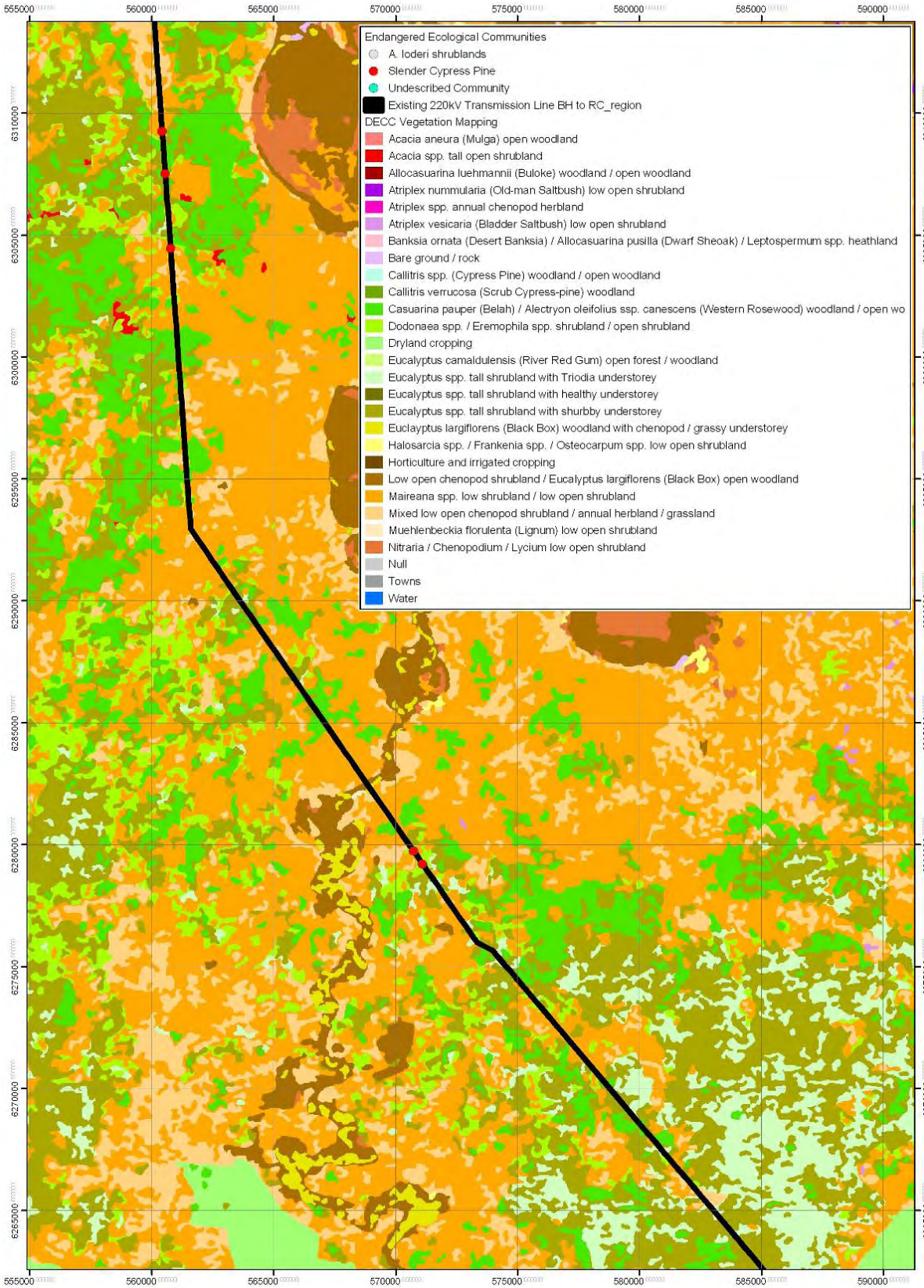
Endangered Ecological Communities (EECs) may present a constraint to clearing. Measures to avoid or mitigate this impact will be required.

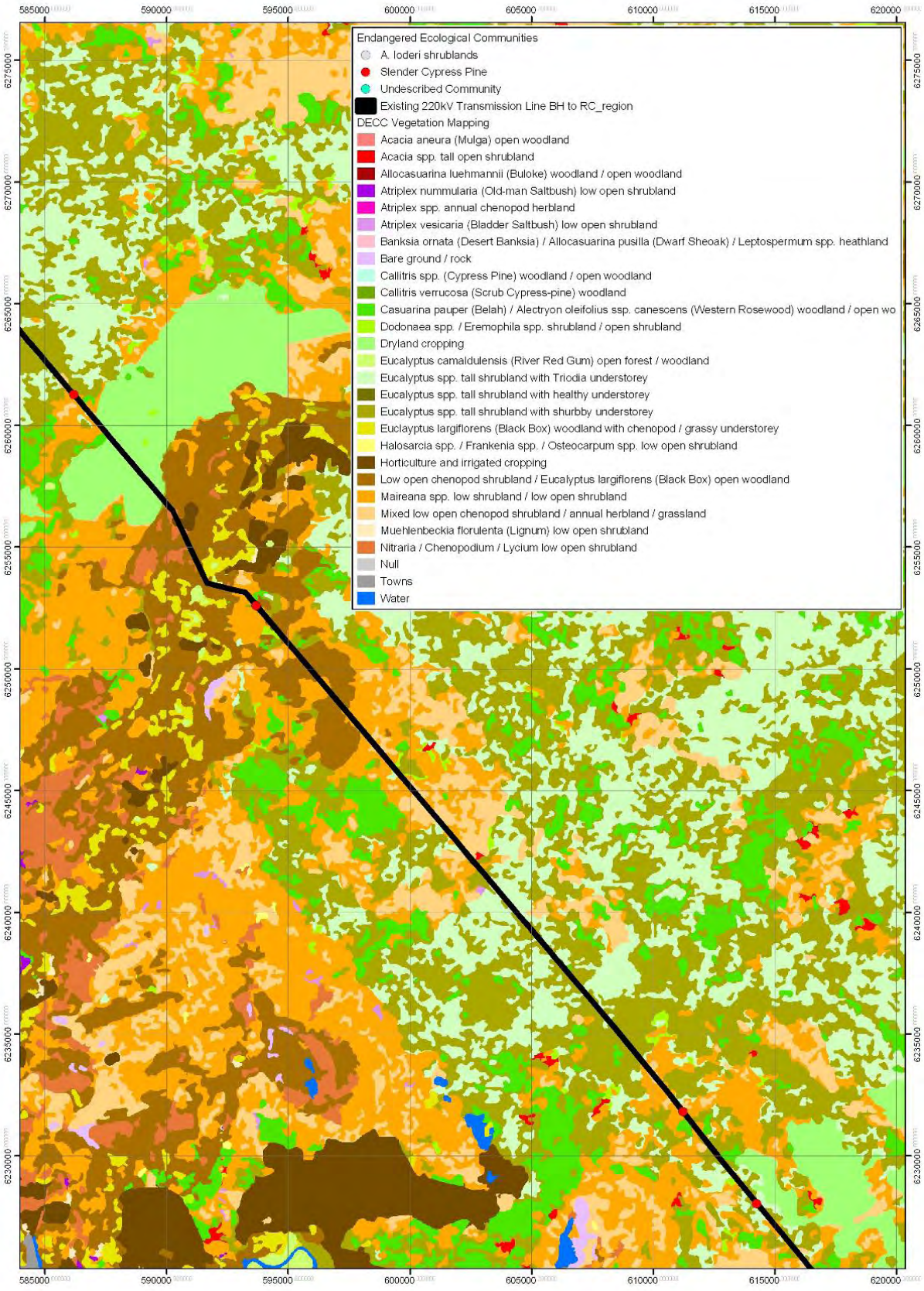
The following maps show the location of EECs within the easement, from north to south.

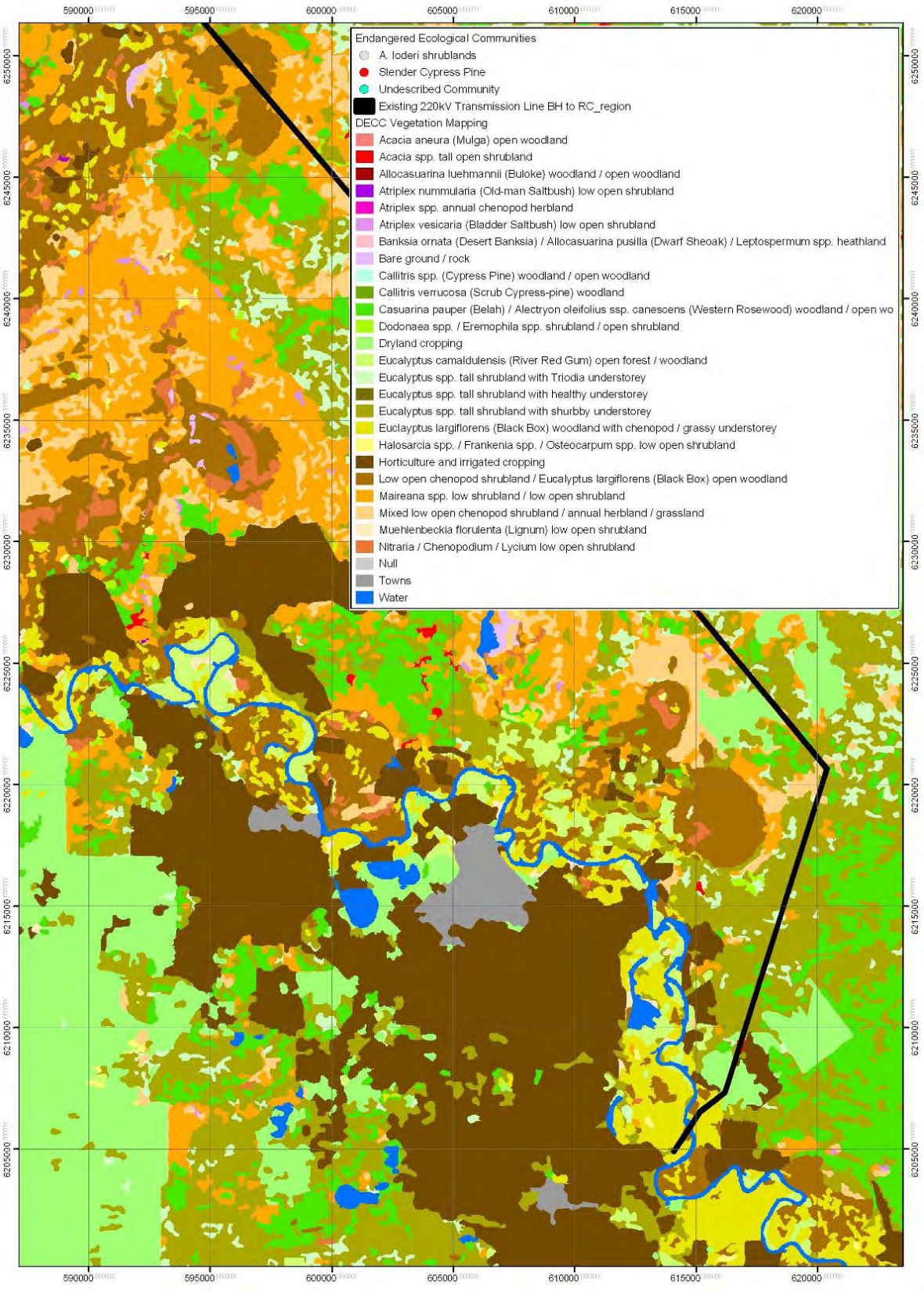

Endangered Ecological Communities
A. loderi shrublands
Slender Cypress Pine
Undescribed Community
Existing 220kV Transmission Line BH to RC_region
DECC Vegetation Mapping
Acacia aneura (Mulga) open woodland
Acacia spp. tall open shrubland
Allocasuarina luehmannii (Buloke) woodland / open woodland
Atriplex nummularia (Old-man Saltbush) low open shrubland
Atriplex spp. annual chenopod herbland
Atriplex vesicaria (Bladder Saltbush) low open shrubland
Banksia ornata (Desert Banksia) / Allocasuarina pusilla (Dwarf Sheoak) / Leptospermum spp. heathland
Bare ground / rock
Callitris spp. (Cypress Pine) woodland / open woodland
Callitris verrucosa (Scrub Cypress-pine) woodland
Casuarina pauper (Belah) / Alectryon oleifolius ssp. canescens (Western Rosewood) woodland / open wo
Dodonaea spp. / Eremophila spp. shrubland / open shrubland
Dryland cropping
Eucalyptus camaldulensis (River Red Gum) open forest / woodland
Eucalyptus spp. tall shrubland with Triodia understorey
Eucalyptus spp. tall shrubland with healthy understorey
Eucalyptus spp. tall shrubland with shurbby understorey
Euclayptus largiflorens (Black Box) woodland with chenopod / grassy understorey
Halosarcia spp. / Frankenia spp. / Osteocarpum spp. low open shrubland
Horticulture and irrigated cropping
Low open chenopod shrubland / Eucalyptus largiflorens (Black Box) open woodland
Maireana spp. low shrubland / low open shrubland
Mixed low open chenopod shrubland / annual herbland / grassland
Muehlenbeckia florulenta (Lignum) low open shrubland
Nitraria / Chenopodium / Lycium low open shrubland
Null
Towns
Water
535000
540000
545000
550000
555000
560000
565000
570000
6460000
6455000
6450000
6445000
6440000
6435000
6430000
6425000
6420000
6415000


Endangered Ecological Communities
A. loderi shrublands
Slender Cypress Pine
Undescribed Community
Existing 220kV Transmission Line BH to RC_region
DECC Vegetation Mapping
Acacia aneura (Mulga) open woodland
Acacia spp. tall open shrubland
Allocasuarina luehmannii (Buloke) woodland / open woodland
Atriplex nummularia (Old-man Saltbush) low open shrubland
Atriplex spp. annual chenopod herbland
Atriplex vesicaria (Bladder Saltbush) low open shrubland
Banksia ornata (Desert Banksia) / Allocasuarina pusilla (Dwarf Sheoak) / Leptospermum spp. heathland
Bare ground / rock
Callitris spp. (Cypress Pine) woodland / open woodland
Callitris verrucosa (Scrub Cypress-pine) woodland
Casuarina pauper (Belah) / Alectryon oleifolius ssp. canescens (Western Rosewood) woodland / open wo
Dodonaea spp. / Eremophila spp. shrubland / open shrubland
Dryland cropping
Eucalyptus camaldulensis (River Red Gum) open forest / woodland
Eucalyptus spp. tall shrubland with Triodia understorey
Eucalyptus spp. tall shrubland with healthy understorey
Eucalyptus spp. tall shrubland with shurbby understorey
Euclayptus largiflorens (Black Box) woodland with chenopod / grassy understorey
Halosarcia spp. / Frankenia spp. / Osteocarpum spp. low open shrubland
Horticulture and irrigated cropping
Low open chenopod shrubland / Eucalyptus largiflorens (Black Box) open woodland
Maireana spp. low shrubland / low open shrubland
Mixed low open chenopod shrubland / annual herbland / grassland
Muehlenbeckia florulenta (Lignum) low open shrubland
Nitraria / Chenopodium / Lycium low open shrubland
Null
Towns
Water
545000
550000
555000
560000
565000
570000
575000
6410000
6405000
6400000
6395000
6390000
6385000
6380000
6375000
6370000
6365000


550000
555000
560000
565000
570000
575000
580000
6360000
6355000
6350000
6345000
6340000
6335000
6330000
6325000
6320000
6315000
Endangered Ecological Communities
A. loderi shrublands
Slender Cypress Pine
Undescribed Community
Existing 220kV Transmission Line BH to RC_region
DECC Vegetation Mapping
Acacia aneura (Mulga) open woodland
Acacia spp. tall open shrubland
Allocasuarina luehmannii (Buloke) woodland / open woodland
Atriplex nummularia (Old-man Saltbush) low open shrubland
Atriplex spp. annual chenopod herbland
Atriplex vesicaria (Bladder Saltbush) low open shrubland
Banksia ornata (Desert Banksia) / Allocasuarina pusilla (Dwarf Sheoak) / Leptospermum spp. heathland
Bare ground / rock
Callitris spp. (Cypress Pine) woodland / open woodland
Callitris verrucosa (Scrub Cypress-pine) woodland
Casuarina pauper (Belah) / Alectryon oleifolius ssp. canescens (Western Rosewood) woodland / open wo
Dodonaea spp. / Eremophila spp. shrubland / open shrubland
Dryland cropping
Eucalyptus camaldulensis (River Red Gum) open forest / woodland
Eucalyptus spp. tall shrubland with Triodia understorey
Eucalyptus spp. tall shrubland with healthy understorey
Eucalyptus spp. tall shrubland with shurbby understorey
Euclayptus largiflorens (Black Box) woodland with chenopod / grassy understorey
Halosarcia spp. / Frankenia spp. / Osteocarpum spp. low open shrubland
Horticulture and irrigated cropping
Low open chenopod shrubland / Eucalyptus largiflorens (Black Box) open woodland
Maireana spp. low shrubland / low open shrubland
Mixed low open chenopod shrubland / annual herbland / grassland
Muehlenbeckia florulenta (Lignum) low open shrubland
Nitraria / Chenopodium / Lycium low open shrubland
Null
Towns
Water


555000
560000
565000
570000
575000
580000
585000
590000
6310000
6305000
6300000
6295000
6290000
6285000
6280000
6275000
6270000
6265000
Endangered Ecological Communities
A. loderi shrublands
Slender Cypress Pine
Undescribed Community
Existing 220kV Transmission Line BH to RC_region
DECC Vegetation Mapping
Acacia aneura (Mulga) open woodland
Acacia spp. tall open shrubland
Allocasuarina luehmannii (Buloke) woodland / open woodland
Atriplex nummularia (Old-man Saltbush) low open shrubland
Atriplex spp. annual chenopod herbland
Atriplex vesicaria (Bladder Saltbush) low open shrubland
Banksia ornata (Desert Banksia) / Allocasuarina pusilla (Dwarf Sheoak) / Leptospermum spp. heathland
Bare ground / rock
Callitris spp. (Cypress Pine) woodland / open woodland
Callitris verrucosa (Scrub Cypress-pine) woodland
Casuarina pauper (Belah) / Alectryon oleifolius ssp. canescens (Western Rosewood) woodland / open wo
Dodonaea spp. / Eremophila spp. shrubland / open shrubland
Dryland cropping
Eucalyptus camaldulensis (River Red Gum) open forest / woodland
Eucalyptus spp. tall shrubland with Triodia understorey
Eucalyptus spp. tall shrubland with healthy understorey
Eucalyptus spp. tall shrubland with shurbby understorey
Euclayptus largiflorens (Black Box) woodland with chenopod / grassy understorey
Halosarcia spp. / Frankenia spp. / Osteocarpum spp. low open shrubland
Horticulture and irrigated cropping
Low open chenopod shrubland / Eucalyptus largiflorens (Black Box) open woodland
Maireana spp. low shrubland / low open shrubland
Mixed low open chenopod shrubland / annual herbland / grassland
Muehlenbeckia florulenta (Lignum) low open shrubland
Nitraria / Chenopodium / Lycium low open shrubland
Null
Towns
Water


585000
590000
595000
600000
605000
610000
615000
620000
6275000
6270000
6265000
6260000
6255000
6250000
6245000
6240000
6235000
6230000
Endangered Ecological Communities
A. loderi shrublands
Slender Cypress Pine
Undescribed Community
Existing 220kV Transmission Line BH to RC_region
DECC Vegetation Mapping
Acacia aneura (Mulga) open woodland
Acacia spp. tall open shrubland
Allocasuarina luehmannii (Buloke) woodland / open woodland
Atriplex nummularia (Old-man Saltbush) low open shrubland
Atriplex spp. annual chenopod herbland
Atriplex vesicaria (Bladder Saltbush) low open shrubland
Banksia ornata (Desert Banksia) / Allocasuarina pusilla (Dwarf Sheoak) / Leptospermum spp. heathland
Bare ground / rock
Callitris spp. (Cypress Pine) woodland / open woodland
Callitris verrucosa (Scrub Cypress-pine) woodland
Casuarina pauper (Belah) / Alectryon oleifolius ssp. canescens (Western Rosewood) woodland / open wo
Dodonaea spp. / Eremophila spp. shrubland / open shrubland
Dryland cropping
Eucalyptus camaldulensis (River Red Gum) open forest / woodland
Eucalyptus spp. tall shrubland with Triodia understorey
Eucalyptus spp. tall shrubland with healthy understorey
Eucalyptus spp. tall shrubland with shurbby understorey
Euclayptus largiflorens (Black Box) woodland with chenopod / grassy understorey
Halosarcia spp. / Frankenia spp. / Osteocarpum spp. low open shrubland
Horticulture and irrigated cropping
Low open chenopod shrubland / Eucalyptus largiflorens (Black Box) open woodland
Maireana spp. low shrubland / low open shrubland
Mixed low open chenopod shrubland / annual herbland / grassland
Muehlenbeckia florulenta (Lignum) low open shrubland
Nitraria / Chenopodium / Lycium low open shrubland
Null
Towns
Water


590000
595000
600000
605000
610000
615000
620000
6250000
6245000
6240000
6235000
6230000
6225000
6220000
6215000
6210000
6205000
Endangered Ecological Communities
A. loderi shrublands
Slender Cypress Pine
Undescribed Community
Existing 220kV Transmission Line BH to RC_region
DECC Vegetation Mapping
Acacia aneura (Mulga) open woodland
Acacia spp. tall open shrubland
Allocasuarina luehmannii (Buloke) woodland / open woodland
Atriplex nummularia (Old-man Saltbush) low open shrubland
Atriplex spp. annual chenopod herbland
Atriplex vesicaria (Bladder Saltbush) low open shrubland
Banksia ornata (Desert Banksia) / Allocasuarina pusilla (Dwarf Sheoak) / Leptospermum spp. heathland
Bare ground / rock
Callitris spp. (Cypress Pine) woodland / open woodland
Callitris verrucosa (Scrub Cypress-pine) woodland
Casuarina pauper (Belah) / Alectryon oleifolius ssp. canescens (Western Rosewood) woodland / open wo
Dodonaea spp. / Eremophila spp. shrubland / open shrubland
Dryland cropping
Eucalyptus camaldulensis (River Red Gum) open forest / woodland
Eucalyptus spp. tall shrubland with Triodia understorey
Eucalyptus spp. tall shrubland with healthy understorey
Eucalyptus spp. tall shrubland with shurbby understorey
Euclayptus largiflorens (Black Box) woodland with chenopod / grassy understorey
Halosarcia spp. / Frankenia spp. / Osteocarpum spp. low open shrubland
Horticulture and irrigated cropping
Low open chenopod shrubland / Eucalyptus largiflorens (Black Box) open woodland
Maireana spp. low shrubland / low open shrubland
Mixed low open chenopod shrubland / annual herbland / grassland
Muehlenbeckia florulenta (Lignum) low open shrubland
Nitraria / Chenopodium / Lycium low open shrubland
Null
Towns
Water

APPENDIX D: THREATENED SPECIES SEARCHES

EPBC report – Stage 2

Protected Matters Search Tool

You are here: Environment Home > EPBC Act > Search

21 December 2007 13:46

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

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

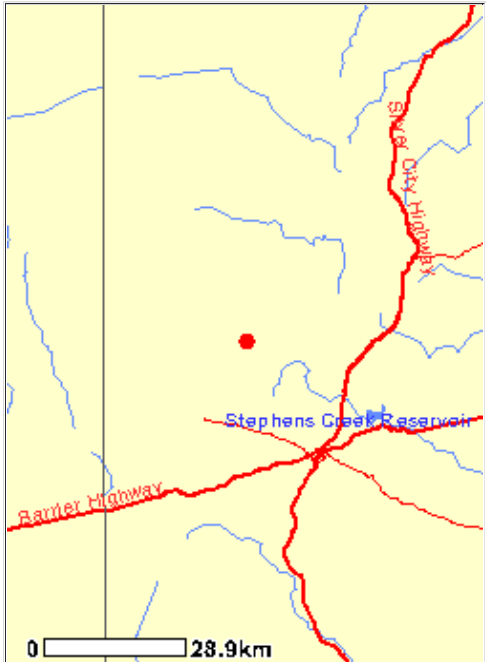
The Australian Natural Resources Atlas at http://www.environment.gov.au/atlas may provide further environmental information relevant to your selected area. Information about the EPBC Act including significance guidelines, forms and application process details can be found at http://www.environment.gov.au/epbc/assessmentsapprovals/index.html

---

Search Type: Point

Buffer: 50 km

Coordinates: -31.71722,141.305



Report Contents:

- Extra Information

Caveat
Acknowledgments

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 Sites)	1
Commonwealth Marine Areas:	None
Threatened Ecological Communities:	None
Threatened Species:	6
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:	7
Commonwealth Heritage Places:	None
Places on the RNE:	44
Listed Marine Species:	7
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves:	None

Extra Information

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

State and Territory Reserves:	None
Other Commonwealth Reserves:	None
Regional Forest Agreements:	None

Details

Matters of National Environmental Significance

Wetlands of International Significance [Dataset Information]
(Ramsar Sites)

LAKE PINAROO	Within same catchment as Ramsar site

Threatened Species [Dataset Information]	Status	Type of Presence
Birds		
Amytornis textilis modestus * Thick-billed Grasswren (eastern)	Vulnerable	Species or species habitat likely to occur within area
Pedionomus torquatus * Plains-wanderer	Vulnerable	Species or species habitat likely to occur within area
Rostratula australis * Australian Painted Snipe	Vulnerable	Species or species habitat may occur within area
Mammals		
Nyctophilus timoriensis (South-eastern form) * Eastern Long-eared Bat	Vulnerable	Species or species habitat may occur within area
Ray-finned fishes		
*Maccullochella peelii peelii** Murray Cod, Cod, Goodoo	Vulnerable	Species or species habitat may occur within area
Plants		
Acacia carneorum * Needle Wattle, Dead Finish, Purple-wood Wattle	Vulnerable	Species or species habitat likely to occur within area
Migratory Species [Dataset Information]	Status	Type of Presence
Migratory Terrestrial Species		
Birds		
Hirundapus caudacutus White-throated Needletail	Migratory	Species or species habitat may occur within area
Merops ornatus * Rainbow Bee-eater	Migratory	Species or species habitat may occur within area
Migratory Wetland Species		
Birds		
Ardea alba Great Egret, White Egret	Migratory	Species or species habitat may occur within area
Ardea ibis Cattle Egret	Migratory	Species or species habitat may occur within area

Gallinago hardwickii ***** Latham's Snipe, Japanese Snipe	Migratory	Species or species habitat may occur within area
Rostratula benghalensis s. lat. Painted Snipe	Migratory	Species or species habitat may occur within area

Migratory Marine Birds

Apus pacificus Fork-tailed Swift	Migratory	Species or species habitat may occur within area
Ardea alba Great Egret, White Egret	Migratory	Species or species habitat may occur within area
Ardea ibis Cattle Egret	Migratory	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Dataset Information]	Status	Type of Presence

Birds

Apus pacificus Fork-tailed Swift	Listed - overfly marine area	Species or species habitat may occur within area
Ardea alba Great Egret, White Egret	Listed - overfly marine area	Species or species habitat may occur within area
Ardea ibis Cattle Egret	Listed - overfly marine area	Species or species habitat may occur within area
Gallinago hardwickii ***** Latham's Snipe, Japanese Snipe	Listed - overfly marine area	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail	Listed - overfly marine area	Species or species habitat may occur within area
Merops ornatus ***** Rainbow Bee-eater	Listed - overfly marine area	Species or species habitat may occur within area
Rostratula benghalensis s. lat. Painted Snipe	Listed - overfly marine area	Species or species habitat may occur within area

Commonwealth Lands [Dataset Information]

Communications, Information Technology and the Arts - Australian Broadcasting Corporation

Communications, Information Technology and the Arts - Australian Postal Corporation

Communications, Information Technology and the Arts - Telstra Corporation Limited

Defence

Defence - Defence Housing Authority

Transport and Regional Services - Airservices Australia

Unknown

Places on the RNE [Dataset Information]
Note that not all Indigenous sites may be listed.

Historic

Astra Hotel NSW

Bank of South Australia (former) NSW

Bon Marche Building NSW

Bon Marche Group NSW

Broken Hill Courthouse NSW

Broken Hill Post Office NSW

Caledonian Hotel NSW

Catholic Cathedral Group NSW

Civic Group NSW

Crown Hotel Group NSW

Crown Hotel NSW

Duke of Cornwall Hotel Including Timber Hall NSW

Former Municipal Chambers NSW

Gaol NSW

Imperial Hotel (former) NSW

Kintore Shaft NSW

Lawrence and Hansons Premises NSW

Line of Lode NSW

Methodist Church Hall NSW

Mount St Josephs Convent of Mercy NSW

Palace Hotel NSW

Pig and Whistle Hotel NSW

Pirie Building NSW

Police Station NSW

Public School - Burke Ward NSW

Sacred Heart Catholic Cathedral Including Stone and Cast Iron Fe NSW

Silver City Working Mans Club NSW

Silver King Hotel NSW

Silverton NSW

Sulphide Street Railway Station NSW

Technical College and Museum NSW

The Old Miners Arms Art Gallery NSW

Town Hall NSW

Trades Hall NSW

Uniting Church Group NSW

Uniting Church NSW

Walter Sully Emporium (former) NSW

War Memorial NSW

Warehouse NSW

West Darling Hotel Facade Only NSW

West Darling Hotel Group NSW

Wilcannia Club Hotel (former) NSW

York Hotel (former) NSW

Indigenous

Euriowie Aboriginal Area (proposed) NSW

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 migratory and marine provisions of the Act have been mapped.

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.

Acknowledgments

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

- New South Wales National Parks and Wildlife Service
- Department of Sustainability and Environment, Victoria
- Department of Primary Industries, Water and Environment, Tasmania
- Department of Environment and Heritage, South Australia Planning SA
- Parks and Wildlife Commission of the Northern Territory
- Environmental Protection Agency, Queensland
- Birds Australia
- Australian Bird and Bat Banding Scheme
- Australian National Wildlife Collection
- Natural history museums of Australia
- Queensland Herbarium
- National Herbarium of NSW
- Royal Botanic Gardens and National Herbarium of Victoria
- Tasmanian Herbarium
- State Herbarium of South Australia
- Northern Territory Herbarium
- Western Australian Herbarium
- Australian National Herbarium, Atherton and Canberra
- University of New England
- Other groups and individuals

ANUCliM Version 1.8, Centre for Resource and Environmental Studies, Australian National University was used extensively for the production of draft maps of species distribution. Environment Australia is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Department of the Environment, Water, Heritage and the Arts
GPO Box 787 Canberra ACT 2601 Australia

Last updated:

Telephone: +61 (0)2 6274 1111

EPBC report – powerline

Protected Matters Search Tool

You are here: Environment Home > EPBC Act > Search

22 January 2008 11:56

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

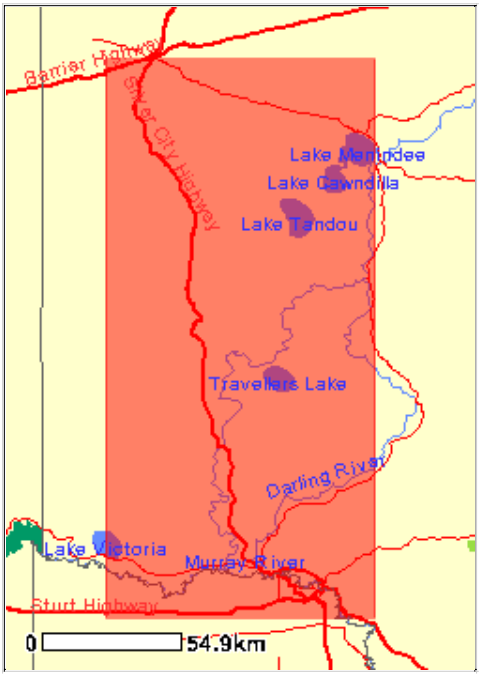
You may wish to print this report for reference before moving to other pages or websites.

The Australian Natural Resources Atlas at http://www.environment.gov.au/atlas may provide further environmental information relevant to your selected area. 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

Search Type: Area

Buffer: 10 km

Coordinates: -31.97222,141.2708, -31.97222,142.3972, -34.30611,142.3972, -34.30611,141.2708



This map may contain data which are
© Commonwealth of Australia
(Geoscience Australia)
© 2007 MapData Sciences Pty Ltd, PSMA

Report Contents:

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 Sites)	8
Commonwealth Marine Areas:	None
Threatened Ecological Communities:	1
Threatened Species:	21
Migratory Species:	13

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:	8
Commonwealth Heritage Places:	None
Places on the RNE:	65
Listed Marine Species:	10
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves:	None

Extra Information

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

State and Territory Reserves:	28
Other Commonwealth Reserves:	None

Regional Forest Agreements: None

Details

Matters of National Environmental Significance

Wetlands of International Significance [Dataset Information] (Ramsar Sites)		
BANROCK STATION WETLAND COMPLEX		Within same catchment as Ramsar site
Banrock Station Wetland Complex		Within same catchment as Ramsar site
COORONG AND LAKES ALEXANDRINA AND ALBERT		Within same catchment as Ramsar site
Coorong and Lakes Alexandrina and Albert		Within same catchment as Ramsar site
HATTAH-KULKYNE LAKES		Within same catchment as Ramsar site
Hattah-Kulkyne Lakes		Within same catchment as Ramsar site
LAKE PINAROO		Within same catchment as Ramsar site
RIVERLAND		Within same catchment as Ramsar site
Threatened Ecological Communities [Dataset Information]	Status	Type of Presence
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	Endangered	Community known to occur within area
Threatened Species [Dataset Information]	Status	Type of Presence
Birds		
*Amytornis textilis modestus** Thick-billed Grasswren (eastern)	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor * Swift Parrot	Endangered	Species or species habitat may occur within area
Leipoa ocellata * Malleefowl	Vulnerable	Species or species habitat likely to occur within area
Manorina melanotis * Black-eared Miner	Endangered	Species or species habitat known to occur within area
Pachycephala rufogularis * Red-lored Whistler	Vulnerable	Species or species habitat likely to occur within area
*Polytelis anthopeplus monarchoides** Regent Parrot (eastern)	Vulnerable	Breeding likely to occur within area
Rostratula australis * Australian Painted Snipe	Vulnerable	Species or species habitat may occur within area
Stipiturus mallee * Mallee Emu-wren	Vulnerable	Species or species habitat likely to occur within area
Frogs		
Litoria raniformis * Growling Grass Frog, Southern Bell Frog, Warty Bell Frog, Green and Golden Frog	Vulnerable	Species or species habitat may occur within area
Mammals		
Nyctophilus timoriensis (South-eastern form) * Eastern Long-eared Bat	Vulnerable	Species or species habitat may occur within area
Ray-finned fishes		

Craterocephalus fluviatilis * Murray Hardyhead	Vulnerable	Species or species habitat likely to occur within area
*Maccullochella peelii peelii** Murray Cod, Cod, Goodoo	Vulnerable	Species or species habitat may occur within area
Plants		
Acacia carneorum * Needle Wattle, Dead Finish, Purple-wood Wattle	Vulnerable	Species or species habitat likely to occur within area
Atriplex infrequens *	Vulnerable	Species or species habitat likely to occur within area
Austrostipa metatoris *	Vulnerable	Species or species habitat likely to occur within area
Austrostipa nullanulla * Club Spear-grass	Vulnerable	Species or species habitat likely to occur within area
Brachyscome papillosa * Mossgiel Daisy	Vulnerable	Species or species habitat likely to occur within area
Lepidium monoplocoides * Winged Pepper-cress	Endangered	Species or species habitat likely to occur within area
Solanum karsense * Menindee Nightshade	Vulnerable	Species or species habitat likely to occur within area
Swainsona murrayana * Slender Darling-pea, Slender Swainson, Murray Swainson-pea	Vulnerable	Species or species habitat likely to occur within area
Swainsona pyrophila * Yellow Swainson-pea	Vulnerable	Species or species habitat likely to occur within area
Migratory Species [Dataset Information]	Status	Type of Presence
Migratory Terrestrial Species		
Birds		
Haliaeetus leucogaster White-bellied Sea-Eagle	Migratory	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail	Migratory	Species or species habitat may occur within area
Leipoa ocellata * Malleefowl	Migratory	Species or species habitat likely to occur within area
Manorina melanotis Black-eared Miner	Migratory	Species or species habitat known to occur within area
Merops ornatus * Rainbow Bee-eater	Migratory	Species or species habitat may occur within area
Migratory Wetland Species		
Birds		
Ardea alba Great Egret, White Egret	Migratory	Breeding likely to occur within area
Ardea ibis Cattle Egret	Migratory	Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper	Migratory	Species or species habitat likely to occur within area
Gallinago hardwickii * Latham's Snipe, Japanese Snipe	Migratory	Species or species habitat may occur within area

Rostratula benghalensis s. lat. Painted Snipe	Migratory	Species or species habitat may occur within area

Migratory Marine Birds

Apus pacificus Fork-tailed Swift	Migratory	Species or species habitat may occur within area
Ardea alba Great Egret, White Egret	Migratory	Breeding likely to occur within area
Ardea ibis Cattle Egret	Migratory	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Dataset Information]	Status	Type of Presence
Birds		
Apus pacificus Fork-tailed Swift	Listed - overfly marine area	Species or species habitat may occur within area
Ardea alba Great Egret, White Egret	Listed - overfly marine area	Breeding likely to occur within area
Ardea ibis Cattle Egret	Listed - overfly marine area	Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper	Listed	Species or species habitat likely to occur within area
Gallinago hardwickii ***** Latham's Snipe, Japanese Snipe	Listed - overfly marine area	Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle	Listed	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail	Listed - overfly marine area	Species or species habitat may occur within area
Lathamus discolor ***** Swift Parrot	Listed - overfly marine area	Species or species habitat may occur within area
Merops ornatus ***** Rainbow Bee-eater	Listed - overfly marine area	Species or species habitat may occur within area
Rostratula benghalensis s. lat. Painted Snipe	Listed - overfly marine area	Species or species habitat may occur within area

Commonwealth Lands [Dataset Information]

Commonwealth Trading Bank of Australia

Communications, Information Technology and the Arts - Australian Broadcasting Corporation

Communications, Information Technology and the Arts - Australian Postal Corporation

Communications, Information Technology and the Arts - Telstra Corporation Limited

Defence

Defence - Defence Housing Authority

Transport and Regional Services - Airservices Australia

Unknown

Places on the RNE [Dataset Information]
Note that not all Indigenous sites may be listed.

Historic

Astra Hotel NSW

Bank of South Australia (former) NSW

Billabong Pump Station VIC

Bon Marche Building NSW

Bon Marche Group NSW

Broken Hill Courthouse NSW

Broken Hill Post Office NSW

Caledonian Hotel NSW

Catholic Cathedral Group NSW

Civic Group NSW

Crown Hotel Group NSW

Crown Hotel NSW

Duke of Cornwall Hotel Including Timber Hall NSW

Gaol NSW

House VIC

Imperial Hotel (former) NSW

Kinchega Woolshed, Shearers Quarters and Homestead Complex NSW

Kintore Shaft NSW

Lawrence and Hansons Premises NSW

Line of Lode NSW

Lock Nine Pumphouse (former) VIC

Methodist Church Hall NSW

Mount St Josephs Convent of Mercy NSW

Palace Hotel NSW

Pig and Whistle Hotel NSW

Pirie Building NSW

Police Station NSW

Psyche Bend Pumping Station (former) VIC

Public School - Burke Ward NSW

Rio Vista VIC
Sacred Heart Catholic Cathedral Including Stone and Cast Iron Fe NSW
Silver City Working Mans Club NSW
Silver King Hotel NSW
Silverton NSW
Sulphide Street Railway Station NSW
Technical College and Museum NSW
The Old Miners Arms Art Gallery NSW
Town Hall NSW
Trades Hall NSW
Uniting Church Group NSW
Uniting Church NSW
Walter Sully Emporium (former) NSW
War Memorial NSW
Warehouse NSW
Wentworth Courthouse NSW
Wentworth Gaol (former) NSW
West Darling Hotel Facade Only NSW
West Darling Hotel Group NSW
Wilcannia Club Hotel (former) NSW
York Hotel (former) NSW

Indigenous

Horseshoe Bend Burial Site VIC
Kangaroo Lake Lunette NSW
Menindee Aboriginal Reserve (former) NSW
Merbein Midden VIC
Rufus River Area NSW
Scropes Range Area NSW
Snaggy Bend Aboriginal Burial Ground NSW
Tandou Lake Lunette NSW

Natural

Kinchega National Park NSW
Meringur Flora and Fauna Reserve VIC
Murray Mallee - Mallee Cliffs National Park NSW
Murray Mallee - Murray Sunset Country VIC
Murray Mallee - Tarawi / Scotia NSW
Nearie Lake Nature Reserve NSW
Yarrara Flora and Fauna Reserve VIC

Extra Information

State and Territory Reserves [Dataset Information]

Benetook Natural Features Reserve - Bushland Reserve, VIC

Karawinna Natural Features Reserve - Bushland Reserve, VIC

Karween Natural Features Reserve - Bushland Reserve, VIC

Kinchega National Park, NSW

Kings Billabong Nature Conservation Reserve - Wildlife Reserve (no hunti, VIC

Lambert Island Nature Conservation Reserve - Flora Reserve, VIC

Mallee Cliffs National Park, NSW

Merbein Natural Features Reserve - Bushland Reserve, VIC

Meringur Nature Conservation Reserve - Flora and Fauna Reserve, VIC

Merrinee Natural Features Reserve - Bushland Reserve, VIC

Mildura I13 Natural Features Reserve - Bushland Reserve, VIC

Mildura I14 Natural Features Reserve - Bushland Reserve, VIC

Mildura I15 Natural Features Reserve - Bushland Reserve, VIC

Mildura I220 Natural Features Reserve - Bushland Reserve, VIC

Mildura I220A Natural Features Reserve - Bushland Reserve, VIC

Mildura I221 Natural Features Reserve - Bushland Reserve, VIC

Mildura Nature Conservation Reserve - Flora and Fauna Reserve, VIC

Murray - Sunset National Park, VIC

Nearie Lake Nature Reserve, NSW

Pirlta Natural Features Reserve - Bushland Reserve, VIC

River Murray Reserve Natural Features Reserve - River Murray Reserve, VIC

Tarawi Nature Reserve, NSW

Tullilah Natural Features Reserve - Bushland Reserve, VIC

Werrimull Natural Features Reserve - Bushland Reserve, VIC

Yarrara Nature Conservation Reserve - Flora and Fauna Reserve, VIC

Yatpool I6 Natural Features Reserve - Bushland Reserve, VIC

Yatpool Nature Conservation Reserve - Flora Reserve, VIC

Yatpool Tank Natural Features Reserve - Bushland Reserve, VIC

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 migratory and marine provisions of the Act have been mapped.

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.

Acknowledgments

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

- New South Wales National Parks and Wildlife Service
- Department of Sustainability and Environment, Victoria
- Department of Primary Industries, Water and Environment, Tasmania
- Department of Environment and Heritage, South Australia Planning SA
- Parks and Wildlife Commission of the Northern Territory
- Environmental Protection Agency, Queensland
- Birds Australia
- Australian Bird and Bat Banding Scheme
- Australian National Wildlife Collection
- Natural history museums of Australia
- Queensland Herbarium
- National Herbarium of NSW
- Royal Botanic Gardens and National Herbarium of Victoria
- Tasmanian Herbarium
- State Herbarium of South Australia
- Northern Territory Herbarium
- Western Australian Herbarium
- Australian National Herbarium, Atherton and Canberra
- University of New England
- Other groups and individuals

ANUCliM Version 1.8, Centre for Resource and Environmental Studies, Australian National University was used extensively for the production of draft maps of species distribution. Environment Australia is extremely grateful to the many organisations and individuals who provided expert advice and information

on numerous draft distributions.

Department of the Environment, Water, Heritage and the Arts
GPO Box 787 Canberra ACT 2601 Australia
Telephone: +61 (0)2 6274 1111

Last updated:

DECC Wildlife Atlas data – Stage 2

Flora

SCIENTIFIC_NAME	COMMON_NAME	EASTING	NORTHING	MAPSHEET_NUMBER
Atriplex acutiloba		541019	6481639	7134
Eleocharis obicis	Spike-Rush	537911	6494582	7134
Indigofera longibractea	Showy Indigo	547364	6489001	7234
Indigofera longibractea	Showy Indigo	550540	6492681	7234
Indigofera longibractea	Showy Indigo	550540	6492681	7234
Indigofera longibractea	Showy Indigo	507894	6489106	7134
Swainsona murrayana	Slender Darling Pea	519997	6469997	7134
Acacia carneorum	Purple-wood Wattle	542520	6463158	7134
Acacia carneorum	Purple-wood Wattle	520494	6472467	7134
Acacia carneorum	Purple-wood Wattle	520490	6470616	7134
Acacia carneorum	Purple-wood Wattle	542520	6463158	7134
Acacia carneorum	Purple-wood Wattle	542520	6463158	7134
Acacia carneorum	Purple-wood Wattle	542520	6463158	7134
Acacia carneorum	Purple-wood Wattle	514186	6472478	7134
Acacia carneorum	Purple-wood Wattle	542000	6464000	7134
Acacia carneorum	Purple-wood Wattle	512000	6472000	7134
Acacia carneorum	Purple-wood Wattle	514186	6472474	7134
Acacia carneorum	Purple-wood Wattle	542520	6463159	7134
Acacia carneorum	Purple-wood Wattle	544095	6463152	7134
Acacia carneorum	Purple-wood Wattle	544095	6463152	7134
Acacia carneorum	Purple-wood Wattle	542566	6474243	7134
Acacia carneorum	Purple-wood Wattle	520491	6472464	7134
Acacia carneorum	Purple-wood Wattle	551969	6463115	7234
Indigofera longibractea	Showy Indigo	547364	6489001	7234
Swainsona viridis	Creeping Darling Pea	531666	6518618	7135
Acanthocladium dockeri	Spiny Everlasting	633233	6414331	7333
Indigofera longibractea	Showy Indigo	547364	6489001	7234
Indigofera longibractea	Showy Indigo	550540	6492681	7234
Indigofera longibractea	Showy Indigo	550540	6492681	7234
Swainsona formosa	Sturt's Desert Pea	630000	6550000	7335
Swainsona formosa	Sturt's Desert Pea	546800	6460000	7134
Swainsona viridis	Creeping Darling Pea	630000	6550000	7335
Swainsona viridis	Creeping Darling Pea	574004	6461132	7234
Swainsona viridis	Creeping Darling Pea	574004	6461132	7234
Swainsona viridis	Creeping Darling Pea	574004	6461132	7234
Acacia carneorum	Purple-wood Wattle	569000	6464500	7234
Acacia carneorum	Purple-wood Wattle	565000	6469500	7234
Acacia carneorum	Purple-wood Wattle	542520	6463159	7134
Acacia carneorum	Purple-wood Wattle	544095	6463152	7134
Acacia carneorum	Purple-wood Wattle	544095	6463152	7134
Acacia carneorum	Purple-wood Wattle	542566	6474243	7134
Acacia carneorum	Purple-wood Wattle	551969	6463115	7234
Solanum karsense	Menindee Nightshade	633236	6414331	7333
Indigofera longibractea	Showy Indigo	547364	6489001	7234
Swainsona viridis	Creeping Darling Pea	630000	6550000	7335
Acacia carneorum	Purple-wood Wattle	595500	6527000	7335

Fauna

SCIENTIFIC_NAME	COMMON_NAME	EASTING	NORTHING	MAPSHEET_NUMBER
Lerista xanthura	Yellow-tailed Plain Slider	547228	6459440	7234
Lerista xanthura	Yellow-tailed Plain Slider	547228	6459440	7234
Tiliqua occipitalis	Western Blue-tongued Lizard	545300	6460000	7134
Aspidites ramsayi	Woma	545000	6514300	7134
Pseudonaja modesta	Ringed Brown Snake	521500	6472500	7134
Oxyura australis	Blue-billed Duck	547000	6465000	7134
Oxyura australis	Blue-billed Duck	547000	6465000	7134
Oxyura australis	Blue-billed Duck	547000	6465000	7134
Grus rubicunda	Brolga	582600	6560800	7235
Ardeotis australis	Australian Bustard	547228	6459440	7234
Ardeotis australis	Australian Bustard	582600	6560800	7235
Ardeotis australis	Australian Bustard	547228	6459440	7234
Rostratula benghalensis australis	Painted Snipe (Australian subspecies)	542000	6464000	7134
Burhinus grallarius	Bush Stone-curlew	547228	6459440	7234
Cacatua leadbeateri	Major Mitchell's Cockatoo	542000	6464000	7134
Cacatua leadbeateri	Major Mitchell's Cockatoo	547000	6459000	7234
Cacatua leadbeateri	Major Mitchell's Cockatoo	583000	6561000	7235
Cacatua leadbeateri	Major Mitchell's Cockatoo	547000	6459000	7234
Neophema splendida	Scarlet-chested Parrot	523000	6456000	7133
Pezoporus occidentalis	Night Parrot	544000	6463200	7134
Climacteris picumnus	Brown Treecreeper	547228	6459440	7234
Climacteris picumnus	Brown Treecreeper	547228	6459440	7234
Pyrrholaemus brunneus	Redthroat	519000	6480000	7134
Pyrrholaemus brunneus	Redthroat	549000	6480000	7234
Pyrrholaemus brunneus	Redthroat	519000	6480000	7134
Pyrrholaemus brunneus	Redthroat	519000	6480000	7134
Pyrrholaemus brunneus	Redthroat	547000	6465000	7134
Pyrrholaemus brunneus	Redthroat	547000	6465000	7134
Pyrrholaemus brunneus	Redthroat	542000	6464000	7134
Certhionyx variegatus	Pied Honeyeater	582600	6560800	7235
Antechinomys laniger	Kultarr	547228	6459440	7234
Antechinomys laniger	Kultarr	547228	6459440	7234
Petrogale xanthopus	Yellow-footed Rock-wallaby	530000	6490000	7134
Petrogale xanthopus	Yellow-footed Rock-wallaby	535000	6515000	7135
Chalinolobus picatus	Little Pied Bat	550476	6479750	7234
Chalinolobus picatus	Little Pied Bat	544103	6465000	7134
Chalinolobus picatus	Little Pied Bat	555169	6472336	7234
Leporillus conditor	Greater Stick-nest Rat	544103	6465000	7134
Grus rubicunda	Brolga	582600	6560800	7235
Ardeotis australis	Australian Bustard	547400	6517600	7135
Ardeotis australis	Australian Bustard	582600	6560800	7235
Cacatua leadbeateri	Major Mitchell's Cockatoo	583000	6561000	7235
Certhionyx variegatus	Pied Honeyeater	582600	6560800	7235
Petrogale xanthopus	Yellow-footed Rock-wallaby	535000	6515000	7135
Chalinolobus picatus	Little Pied Bat	550476	6479750	7234
Chalinolobus picatus	Little Pied Bat	544103	6465000	7134

SCIENTIFIC_NAME	COMMON_NAME	EASTING	NORTHING	MAPSHEET_NUMBER
Chalinolobus picatus	Little Pied Bat	555169	6472336	7234
Leporillus conditor	Greater Stick-nest Rat	544103	6465000	7134
Lerista xanthura	Yellow-tailed Plain Slider	547228	6459440	7234
Lerista xanthura	Yellow-tailed Plain Slider	547228	6459440	7234
Tiliqua occipitalis	Western Blue-tongued Lizard	545300	6460000	7134
Oxyura australis	Blue-billed Duck	556000	6472500	7234
Oxyura australis	Blue-billed Duck	547000	6465000	7134
Oxyura australis	Blue-billed Duck	547000	6465000	7134
Oxyura australis	Blue-billed Duck	556000	6472500	7234
Oxyura australis	Blue-billed Duck	547000	6465000	7134
Lophoictinia isura	Square-tailed Kite	610000	6436000	7333
Lophoictinia isura	Square-tailed Kite	620000	6410000	7333
Grus rubicunda	Brolga	582600	6560800	7235
Ardeotis australis	Australian Bustard	569300	6471000	7234
Ardeotis australis	Australian Bustard	589800	6477000	7234
Ardeotis australis	Australian Bustard	547228	6459440	7234
Ardeotis australis	Australian Bustard	582600	6560800	7235
Ardeotis australis	Australian Bustard	547228	6459440	7234
Burhinus grallarius	Bush Stone-curlew	547228	6459440	7234
Cacatua leadbeateri	Major Mitchell's Cockatoo	547000	6459000	7234
Cacatua leadbeateri	Major Mitchell's Cockatoo	583000	6561000	7235
Cacatua leadbeateri	Major Mitchell's Cockatoo	547000	6459000	7234
Pezoporus occidentalis	Night Parrot	544000	6463200	7134
Tyto capensis	Grass Owl	603400	6415400	7333
Climacteris picumnus	Brown Treecreeper	547228	6459440	7234
Climacteris picumnus	Brown Treecreeper	547228	6459440	7234
Pyrrholaemus brunneus	Redthroat	549000	6480000	7234
Pyrrholaemus brunneus	Redthroat	547000	6465000	7134
Pyrrholaemus brunneus	Redthroat	547000	6465000	7134
Pyrrholaemus brunneus	Redthroat	553641	6469541	7234
Pyrrholaemus brunneus	Redthroat	558300	6493550	7234
Certhionyx variegatus	Pied Honeyeater	582600	6560800	7235
Melanodryas cucullata	Hooded Robin	556109	6471222	7234
Antechinomys laniger	Kultarr	547228	6459440	7234
Antechinomys laniger	Kultarr	547228	6459440	7234
Dasyurus maculatus	Spotted-tailed Quoll	593598	6471076	7234
Sminthopsis macroura	Stripe-faced Dunnart	623742	6538256	7335
Macrotis lagotis	Bilby	575000	6475000	7234
Petrogale xanthopus	Yellow-footed Rock-wallaby	634920	6543662	7335
Chalinolobus picatus	Little Pied Bat	550476	6479750	7234
Chalinolobus picatus	Little Pied Bat	544103	6465000	7134
Chalinolobus picatus	Little Pied Bat	555169	6472336	7234
Chalinolobus picatus	Little Pied Bat	558353	6477860	7234
Leporillus conditor	Greater Stick-nest Rat	544103	6465000	7134
Notomys longicaudatus	Long-tailed Hopping-mouse	556755	6474175	7234
Pseudomys hermannsburgensis	Sandy Inland Mouse	634920	6543662	7335
Chalinolobus picatus	Little Pied Bat	550476	6479750	7234
Chalinolobus picatus	Little Pied Bat	544103	6465000	7134
Chalinolobus picatus	Little Pied Bat	555169	6472336	7234

SCIENTIFIC_NAME	COMMON_NAME	EASTING	NORTHING	MAPSHEET_NUMBER
Leggadina forresti	Forrest's Mouse	560710	6560300	7235
Leggadina forresti	Forrest's Mouse	576000	6556000	7235
Leggadina forresti	Forrest's Mouse	560710	6560300	7235
Leggadina forresti	Forrest's Mouse	560710	6560300	7235
Leggadina forresti	Forrest's Mouse	560710	6560300	7235
Leggadina forresti	Forrest's Mouse	566800	6560900	7235
Leporillus conditor	Greater Stick-nest Rat	544103	6465000	7134
Pseudomys hermannsburgensis	Sandy Inland Mouse	634920	6543662	7335
Pseudomys hermannsburgensis	Sandy Inland Mouse	575000	6565000	7235
Liasis stimsoni	Stimson's Python	555300	6529500	7235
Oxyura australis	Blue-billed Duck	560700	6560300	7235
Stictonetta naevosa	Freckled Duck	560700	6560300	7235
Grus rubicunda	Brolga	582600	6560800	7235
Ardeotis australis	Australian Bustard	588000	6526000	7235
Ardeotis australis	Australian Bustard	547400	6517600	7135
Ardeotis australis	Australian Bustard	582600	6560800	7235
Phaps histrionica	Flock Bronzewing	586000	6527000	7235
Cacatua leadbeateri	Major Mitchell's Cockatoo	598000	6556000	7335
Cacatua leadbeateri	Major Mitchell's Cockatoo	583000	6561000	7235
Certhionyx variegatus	Pied Honeyeater	576000	6556000	7235
Certhionyx variegatus	Pied Honeyeater	582600	6560800	7235
Melanodryas cucullata	Hooded Robin	566769	6560941	7235
Sminthopsis macroura	Stripe-faced Dunnart	572500	6556500	7235
Sminthopsis macroura	Stripe-faced Dunnart	623742	6538256	7335
Petrogale xanthopus	Yellow-footed Rock-wallaby	634920	6543662	7335
Petrogale xanthopus	Yellow-footed Rock-wallaby	559000	6524000	7235
Petrogale xanthopus	Yellow-footed Rock-wallaby	559000	6524000	7235
Petrogale xanthopus	Yellow-footed Rock-wallaby	643306	6576811	7436

Bionet report - powerline

search & map species | taxonomic search | feedback

BioNet

Add species to map groups

Selected Area: User Defined - 140.74,-34.44,142.27,-31.32
Search Type: Flora
Agencies: NSW State Forests, National Parks & Wildlife Service, Royal Botanic Gardens
Threatened Status: E1,E4,FE,FV,V
Search Term: Search All Records

You can now determine which species you would like to map. You do this by adding the species you want to map to a map group. There are five map groups. The species allocated to each map group are displayed on the map in the same symbol.

By default only the first 500 species found are displayed. If your search produces more results than this, then please choose "Next 500" to view the next five hundred search results, or choose "Show All" to view all records (upto 3000 results).

Note that a MAXIMUM total of 20 species can be assigned to Map Groups.

Matching Records: 39 (Showing: 1 - 39)

Auto assign to Group 1 | Next Step

Order	Family	Sci Name	Common Name	Agency	Threat	Count	MapGroup
	Asteraceae						
		Calotis moorei		RBGPub	E1	1	
		Cratystylis conocephala	Bluebush Daisy	RBGPub	E1	10	
		Cratystylis conocephala		NPPub	E1	17	
		Erodiophyllum elderi	Koonamore Daisy	RBGPub	E1	5	
		Erodiophyllum elderi		NPPub	E1	1	
		Kippistia suaedifolia		NPPub	E1	2	
	Casuarinaceae						
		Casuarina obesa		NPPub	E1	2	
	Chenopodiaceae						
		Atriplex acutiloba		RBGPub	E4	1	
		Atriplex acutiloba		NPPub	E4	1	
		Atriplex infrequens		NPPub	V	1	
	Cyperaceae						
		Eleocharis obicis		RBGPub	V	1	
		Eleocharis obicis		NPPub	V	1	
	Fabaceae (Faboideae)						
		Indigofera longibractea		RBGPub	E1	3	
		Indigofera longibractea		NPPub	E1	4	
		Swainsona colutoides	Bladder Senna	RBGPub	E1	3	
		Swainsona flavicarinata		RBGPub	E1	2	
		Swainsona pyrophila		RBGPub	V	1	
		Swainsona viridis	Creeping Darling Pea	RBGPub	E1	4	
		Swainsona adenophylla		NPPub	E1	1	
		Swainsona colutoides		NPPub	E1	7	
		Swainsona flavicarinata		NPPub	E1	1	
		Swainsona murrayana		NPPub	V	1	

Swainsona pyrophila		NPPub	V	3	
Swainsona viridis		NPPub	E1	4	
Fabaceae (Mimosoideae)					
Acacia carnei		RBGPub	V	1	
Acacia carneorum	Needle Wattle	RBGPub	V	21	
Acacia notabilis	Flinders Wattle	RBGPub	E1	4	
Acacia rivalis	Creek Wattle	RBGPub	E1	8	
Acacia acanthoclada		NPPub	E1	4	
Acacia carneorum		NPPub	V	65	
Haloragaceae					
Haloragis exalata		NPPub	V	4	
Poaceae					
Austrostipa nullanulla		RBGPub	E1	9	
Austrostipa nullanulla		NPPub	E1	13	
Polygonaceae					
Convolvulus tedmoorei		RBGPub	E1	2	
Santalaceae					
Santalum murrayanum		NPPub	E1	1	
Sapindaceae					
Dodonaea stenozyga		RBGPub	E1	1	
Dodonaea stenozyga		NPPub	E1	1	
Solanaceae					
Solanum karsense		RBGPub	V	18	
Solanum karsense		NPPub	V	20	

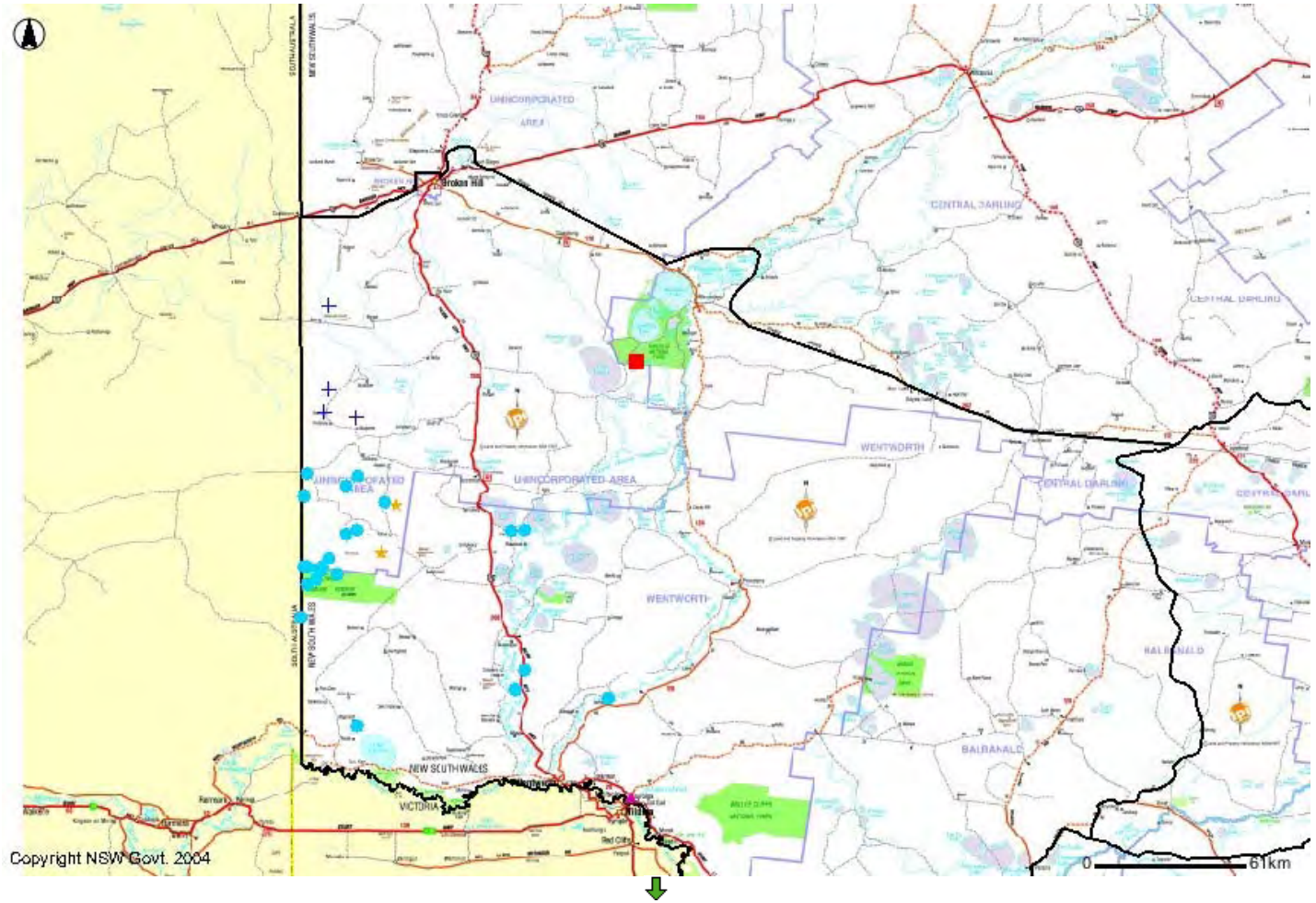
Auto assign to Group 1 Next Step

search & map species | taxonomic search | feedback

BioNet

Tools

Zoom In
Zoom Out
Center Map
Specimen Info
Area Info
Full Screen Map
Redraw Map



Map Scale 1:1092858

Map Groups

Show		Open
■	Map Group 1	
	Calotis moorei(RBGPub)	
●	Map Group 2	
	Cratystylis conocephala(RBGPub)	
	Cratystylis conocephala(NPPub)	
+	Map Group 3	
	Erodiophyllum elderi(RBGPub)	
	Erodiophyllum elderi(NPPub)	
★	Map Group 4	
	Kippistia suaedifolia(NPPub)	
▲	Map Group 5	
	Casuarina obesa(NPPub)	

All Groups: Open/Close

Record Visibility

- All NSW records
- 140.74,-34.44,142.27 only

Layers

Active	Show	
	☐	Sat Image
	☑	Topographic
	☐	NSW Boundary
●	☐	Bioregions
○	☐	Botanic Subdiv
○	☐	Mapsheets
○	☐	LGA
○	☐	Nat Parks
○	☐	State Forest
○	☑	CMA
○	☐	Rivers
○	☐	Roads
○	☐	Towns

Collections

Show

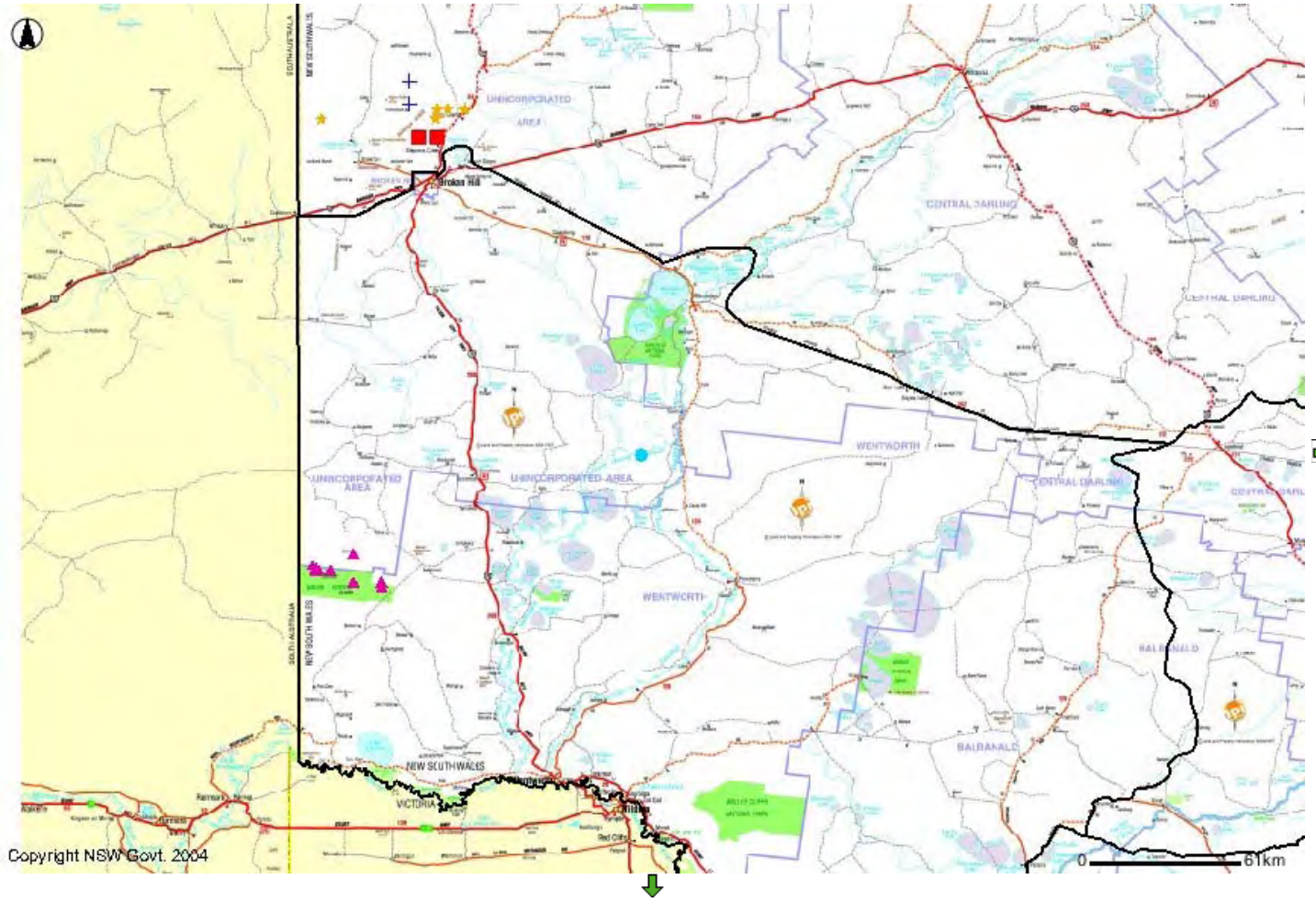
- ☐ Aust Museum
- ☑ Nat Parks
- ☐ Fisheries
- ☑ State Forests
- ☑ Botanic Gardens

search & map species | taxonomic search | feedback

BioNet

Tools

Zoom In
Zoom Out
Center Map
Specimen Info
Area Info
Full Screen Map
Redraw Map



Map Scale 1:1092858

Map Groups

Show Open

- Map Group 1
  - Atriplex acutiloba(RBGPub)
  - Atriplex acutiloba(NPPub)
- Map Group 2
  - Atriplex infrequens(NPPub)
- Map Group 3
  - Eleocharis obicis(RBGPub)
  - Eleocharis obicis(NPPub)
- Map Group 4
  - Indigofera longibractea(RBGPub)
  - Indigofera longibractea(NPPub)
- Map Group 5
  - Swainsona colutoides(RBGPub)
  - Swainsona colutoides(NPPub)

All Groups: Open/Close

Record Visibility

- All NSW records
- 140.74,-34.44,142.27 only

Layers

Active	Show	
	☐	Sat Image
	☑	Topographic
	☐	NSW Boundary
◉	☐	Bioregions
○	☐	Botanic Subdiv
○	☐	Mapsheets
○	☐	LGA
○	☐	Nat Parks
○	☐	State Forest
○	☑	CMA
○	☐	Rivers
○	☐	Roads
○	☐	Towns

Collections

Show

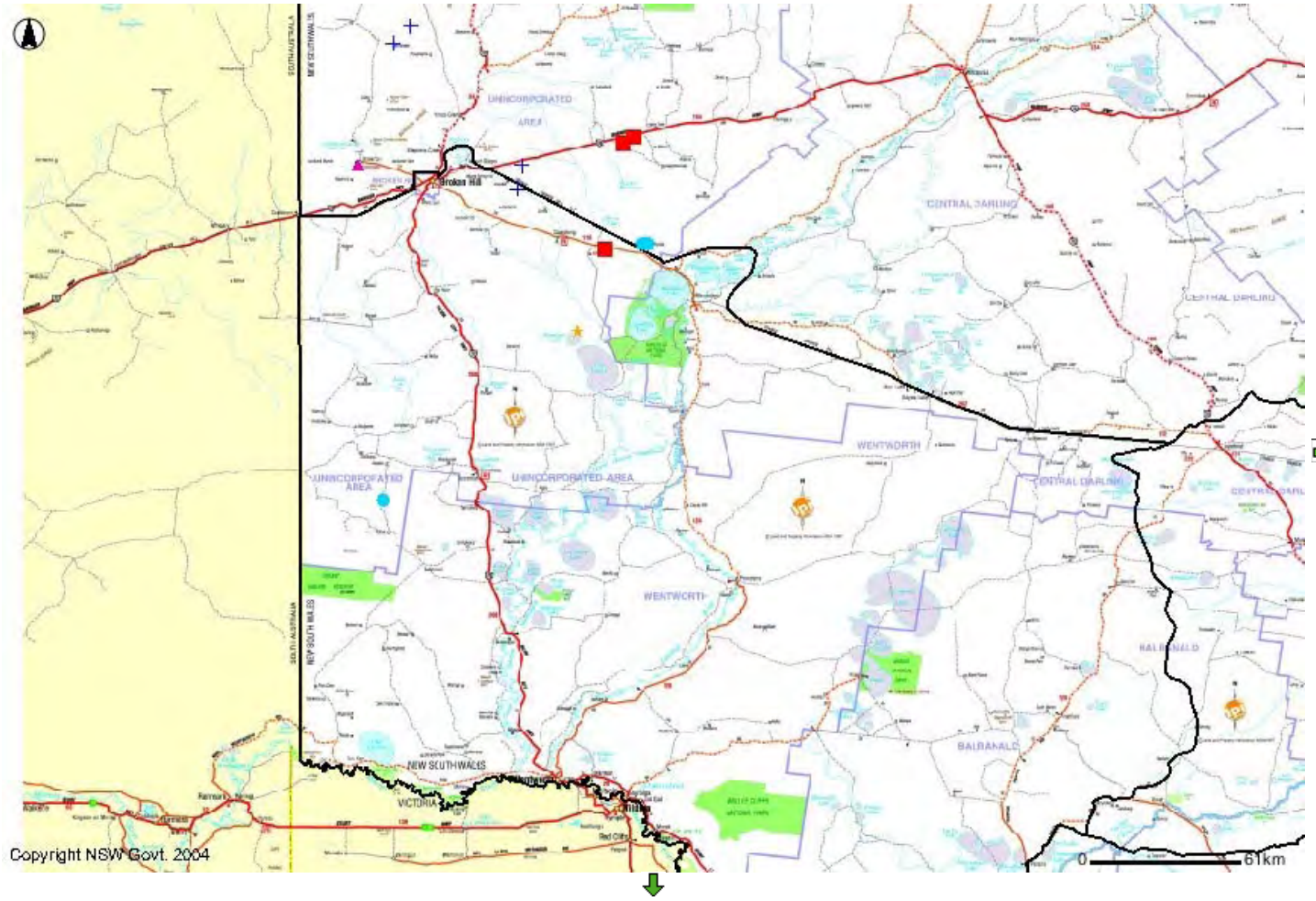
- ☐ Aust Museum
- ☑ Nat Parks
- ☐ Fisheries
- ☑ State Forests
- ☑ Botanic Gardens

search & map species | taxonomic search | feedback

BioNet

Tools

Zoom In
Zoom Out
Center Map
Specimen Info
Area Info
Full Screen Map
Redraw Map



Map Scale 1:1092858

Map Groups

Show / Open

- Map Group 1
  - Swainsona flavicarinata(RBGPub)
  - Swainsona flavicarinata(NPPub)
- Map Group 2
  - Swainsona pyrophila(RBGPub)
  - Swainsona pyrophila(NPPub)
- Map Group 3
  - Swainsona viridis(RBGPub)
  - Swainsona viridis(NPPub)
- Map Group 4
  - Swainsona adenophylla(NPPub)
- Map Group 5
  - Swainsona murrayana(NPPub)

All Groups: Open/Close

Record Visibility

- All NSW records
- 140.74,-34.44,142.27 only

Layers

Active	Show	
	☐	Sat Image
	☑	Topographic
	☐	NSW Boundary
◉	☐	Bioregions
○	☐	Botanic Subdiv
○	☐	Mapsheets
○	☐	LGA
○	☐	Nat Parks
○	☐	State Forest
○	☑	CMA
○	☐	Rivers
○	☐	Roads
○	☐	Towns

Collections

Show

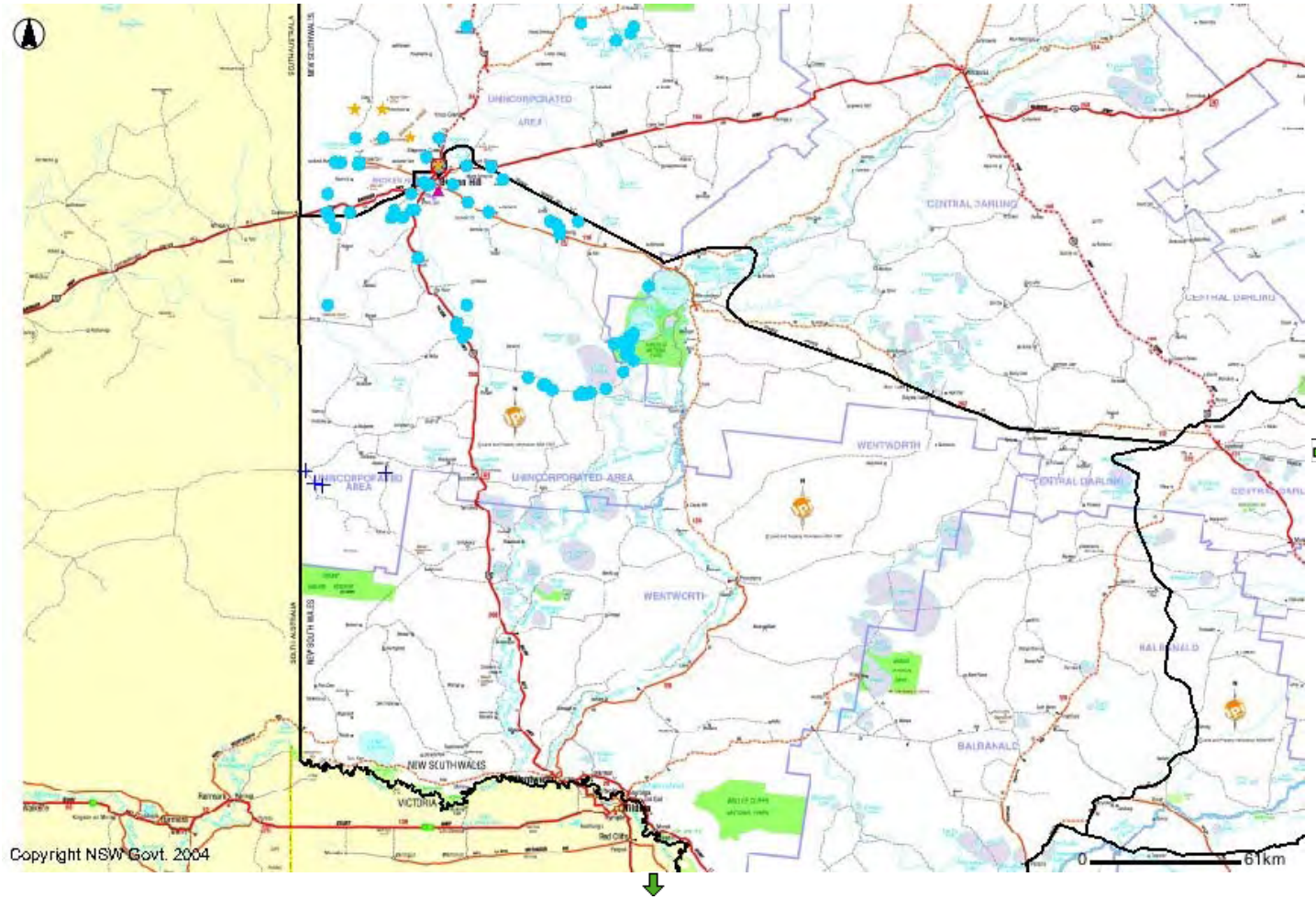
- ☐ Aust Museum
- ☑ Nat Parks
- ☐ Fisheries
- ☑ State Forests
- ☑ Botanic Gardens

search & map species | taxonomic search | feedback

BioNet

Tools

Zoom In
Zoom Out
Center Map
Specimen Info
Area Info
Full Screen Map
Redraw Map



Map Scale 1:1092858

Map Groups

Show Open

- Map Group 1 — Acacia carnei(RBGPub)
- Map Group 2 — Acacia carneorum(RBGPub), Acacia carneorum(NPPub)
- Map Group 3 — Acacia acanthoclada(NPPub)
- Map Group 4 — Acacia rivalis(RBGPub)
- Map Group 5 — Acacia notabilis(RBGPub)

All Groups: Open/Close

Record Visibility

- All NSW records
- 140.74,-34.44,142.27 only

Layers

Active	Show	
	☐	Sat Image
	☑	Topographic
	☐	NSW Boundary
●	☐	Bioregions
○	☐	Botanic Subdiv
○	☐	Mapsheets
○	☐	LGA
○	☐	Nat Parks
○	☐	State Forest
○	☑	CMA
○	☐	Rivers
○	☐	Roads
○	☐	Towns

Collections

Show

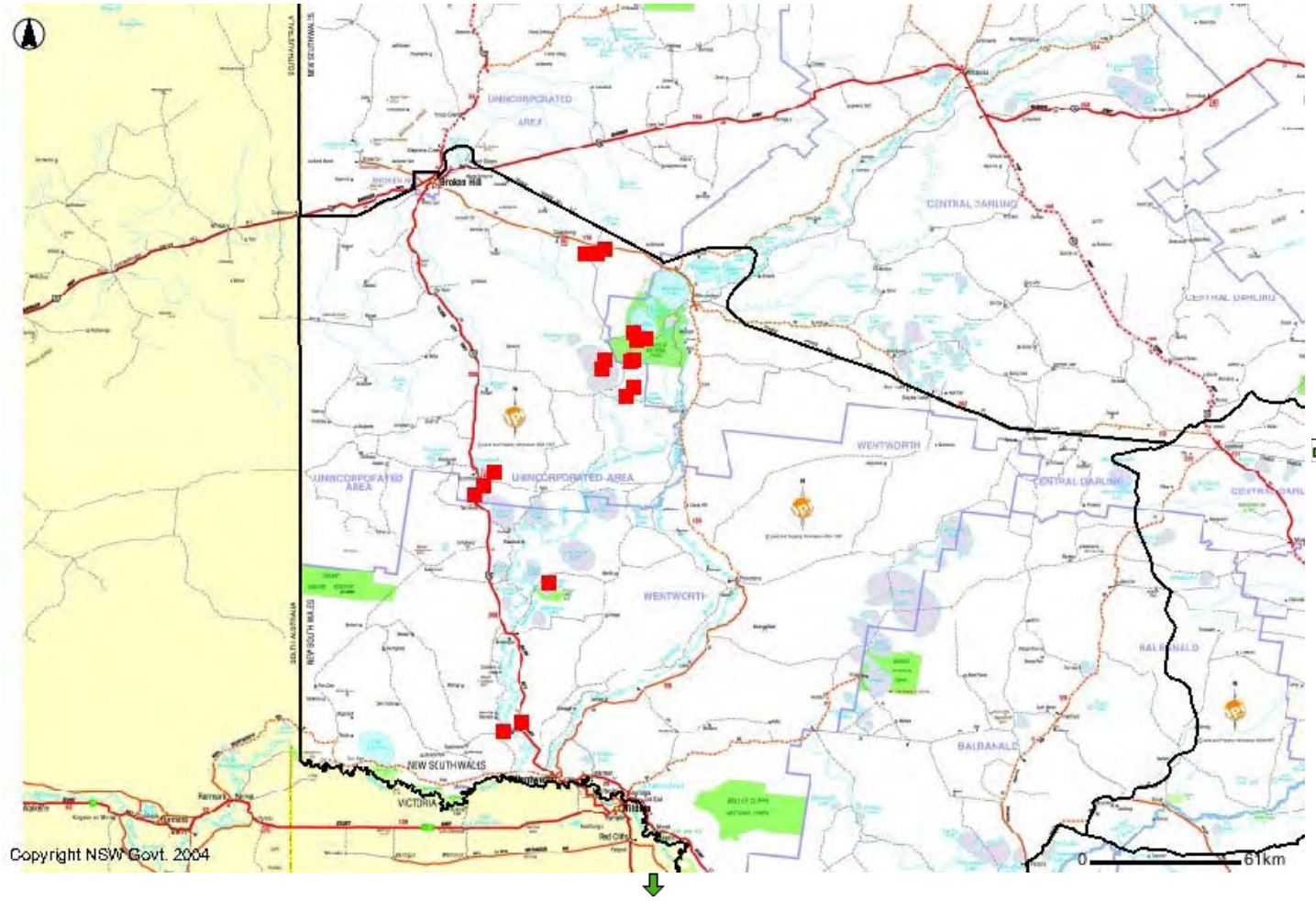
- ☐ Aust Museum
- ☑ Nat Parks
- ☐ Fisheries
- ☑ State Forests
- ☑ Botanic Gardens

search & map species | taxonomic search | feedback

BioNet

Tools

Zoom In
Zoom Out
Center Map
Specimen Info
Area Info
Full Screen Map
Redraw Map



Map Scale 1:1092858

Map Groups

Show Open

Map Group 1

Solanum karsense(RBGPub)
Solanum karsense(NPPub)

All Groups: Open/Close

Record Visibility

- All NSW records
- 140.74,-34.44,142.27 only

Layers

Active	Show	
	☐	Sat Image
	☑	Topographic
	☐	NSW Boundary
●	☐	Bioregions
	☐	Botanic Subdiv
	☐	Mapsheets
	☐	LGA
	☐	Nat Parks
	☐	State Forest
	☑	CMA
	☐	Rivers
	☐	Roads
	☐	Towns

Collections

Show

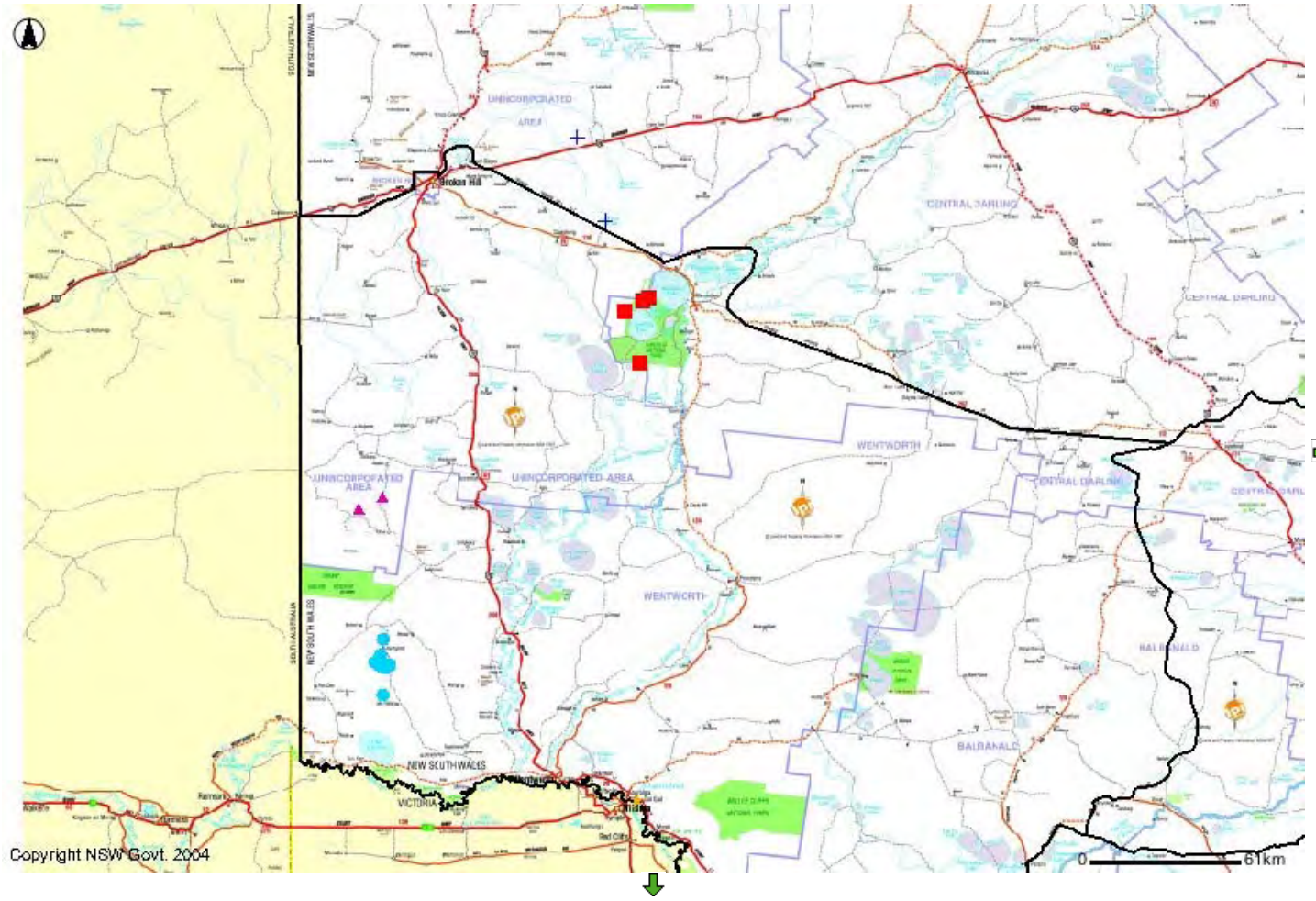
- ☐ Aust Museum
- ☑ Nat Parks
- ☐ Fisheries
- ☑ State Forests
- ☑ Botanic Gardens

search & map species | taxonomic search | feedback

BioNet

Tools

Zoom In
Zoom Out
Center Map
Specimen Info
Area Info
Full Screen Map
Redraw Map



Map Scale 1:1092858

Map Groups

Show Open

- Map Group 1 — Haloragis exalata(NPPub)
- Map Group 2 — Austrostipa nullanulla(RBGPub), Austrostipa nullanulla(NPPub)
- Map Group 3 — Convolvulus tedmoorei(RBGPub)
- Map Group 4 — Santalum murrayanum(NPPub)
- Map Group 5 — Dodonaea stenozyga(RBGPub), Dodonaea stenozyga(NPPub)

All Groups: Open/Close

Record Visibility

- All NSW records
- 140.74,-34.44,142.27 only

Layers

Active Show

- Sat Image
- Topographic
- NSW Boundary
- Bioregions
- Botanic Subdiv
- Mapsheets
- LGA
- Nat Parks
- State Forest
- CMA
- Rivers
- Roads
- Towns

Collections

Show

- Aust Museum
- Nat Parks
- Fisheries
- State Forests
- Botanic Gardens

APPENDIX E: POWER LINE PHOTOGRAPHS

Photo 1: Undescribed community

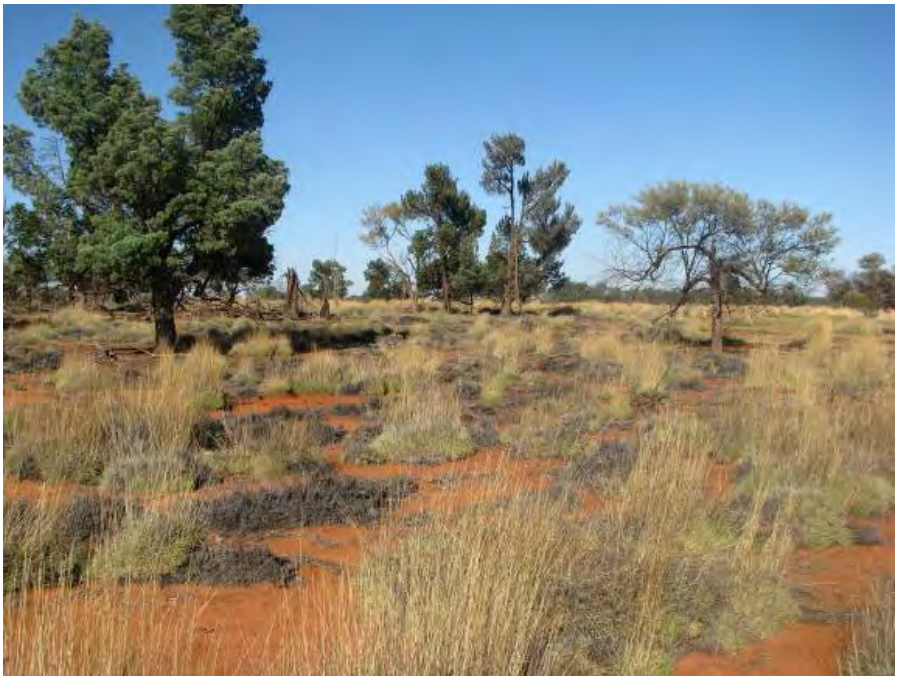


Photo 2: Undescribed community

Photo 3: Acacia loderi shrublands EEC

Photo 4: Acacia loderi shrublands EEC

Photo 5: Slender Cypress pine Benson Community Ref 21 – poor condition