

NORTHERN FORESTS NATIVE FOREST
RESERVES RESOURCE DOCUMENT
Wirrabara Range, Spaniards Gully & King Tree

March 2011





Foreword

The Northern Forests Native Forest Reserves Resource Document has been prepared to clearly state the purpose and objectives for these Reserves and to summarise resource information pertaining to them.

This resource document aligns with the relevant legislation, procedures and actions contained within the Northern Forests Forest Management Plan, ForestrySA's Forest Management System and Forestry Manual.

The relevant areas delineated herein are proclaimed or planned to be proclaimed as Native Forest Reserves under the *Forestry Act 1950*.

The resource document includes details of work to be undertaken under a proposed management program, and relevant biological data. Information contained in this document is current at the date of production.

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Introduction

The Northern Forests Native Forest Reserves (NFNFR's), located within the Wirrabara Forest Reserve situated in the Mid North of South Australia, contain 3,252ha of native vegetation. The NFNFR's are comprised of Wirrabara Range, Spaniards Gully and King Tree Native Forest Reserves.

King Tree was gazetted as a Native Forest Reserve (NFR) under the *Forestry Act 1950* in 2001. Wirrabara Range and Spaniards Gully are in the process of being gazetted as NFR's. However, for the purpose of this document all of the reserves will be referred to as the NFNFR's.

This document presents a management program aimed at protecting and enhancing the biodiversity assets of the NFNFR's. The Management Program will be reviewed at 5-yearly intervals and the long-term objectives at 10-yearly intervals, as management objectives and actions may change in response to new or additional information about the area; the achievement of management programs; impacts resulting from public use or land use in surrounding areas; or impacts from natural events.

The natural resources data contained within Appendices 1-2 provides the latest available information on flora and fauna but will continually be updated.

The production of this document has arisen due to a management action identified in the Northern Forests Forest Management Plan (ForestrySA, 2008). The Resource Document replaces 'Native Forest Reserve Management Plans' that were previously produced for NFR's in the Mount Lofty Ranges and in the Green Triangle. The Northern Forests Forest Management Plan, primarily focussed on Wirrabara and Bundaleer Forest Reserves, provides relevant background information for the NFNFRs. It describes the management context and planning framework, and provides a summary of the natural, built and heritage values, community use and issues that impact on the management of the areas. The plan covers both land uses of plantation forestry and conservation and addresses recreational and community use and the significant historical and heritage aspects of the Northern Forest Reserves. The Northern Forests Plan is available online at <http://www.forestry.sa.gov.au/enviro.stm>.

Purpose of the Native Forest Reserves

The NFNFR's will be managed to conserve their biodiversity by sustaining their indigenous plant and animal communities as enduring and dynamic ecosystems.

ForestrySA manages over 130,000ha of Crown Land in South Australia dedicated as Forest Reserves under the *Forestry Act 1950*. Approximately 30,000ha of this land is native forest, woodland or enclosed wetland, located in the Southern Flinders Ranges, the Mount Lofty Ranges and the Lower South East of South Australia.

There are smaller areas of native forest within Wirrabara Forest Reserve that are protected within a Conservation Zone and are generally managed for biodiversity, although they are not formally gazetted under the *Forestry Act 1950*. In Wirrabara Forest Reserve there is approximately 950ha of Conservation Zone in addition to the NFR's. These areas are not specifically covered in this document. Management actions recommended in the Northern Forests Forest Management Plan (ForestrySA, 2008) address the management of these areas.

Introduction cont.

Location and Description

The NFNFR's are located in the Southern Flinders Ranges about 220km north of Adelaide and approximately 8km west of the township of Wirrabara (Figure 1). Wirrabara Range, also known by the locality name The Range, comprises 2,704ha of native vegetation. Spaniards Gully, also known by the locality name, Beetaloo, comprises 531ha of native vegetation, managed for conservation purposes. King Tree comprises 16.9ha of native vegetation.

Wirrabara Range NFR comprises Sections 4, 10, Part Section 18 and 19 in the Hundred of Darling, within the District Council of Mount Remarkable. Spaniards Gully NFR comprises part of Section 1 in the Hundred of Darling and part of Sections 15 and 220 in the Hundred of Howe. The reserve is predominately within the Northern Areas Council except for the northern portion, which is within the District Council of Mount Remarkable. King Tree NFR comprises Sections 301 and 302 in the Hundred of Darling, within the District Council of Mount Remarkable (Figure 2). Compartment names and areas are displayed in Figure 3.

Telowie Gorge Conservation Park (1,967ha) adjoins the western side of Wirrabara Range and part of the Mount Remarkable National Park (Napperby Block-1,707ha) adjoins the south-west corner. The Beetaloo Reservoir Reserve (5,095ha) managed by SA Water adjoins the southern boundary of Wirrabara Range and the southern and western boundary of Spaniards Gully.

Significant Values

The following attributes of the reserves are considered to be of significant conservation and cultural value:

- > The native vegetation in the forest reserves contributes significantly to biodiversity conservation in the region where less than 7% of the area is conserved as protected areas (Department for Environment & Heritage, 2001).
- > Wirrabara Range NFR is identified as a significant biodiversity asset for the region because of its size, proximity to other protected remnants and quality of the habitat (Department for Environment & Heritage, 2001).
- > The "King Tree" is an example of the dimensions which can be attained by the species, *Eucalyptus camaldulensis*. The King Tree has been listed on the register of significant trees, compiled by the National Trust of South Australia.
- > The NFNFR's and adjacent surrounds contain 497 identified native flora species; 2 with National Conservation Ratings; 28 with State Conservation Ratings; and 131 with Conservation Ratings for the Northern Lofty region.
- > The native forest reserves contain priority vegetation associations with conservation ratings and some that are endemic to the region.

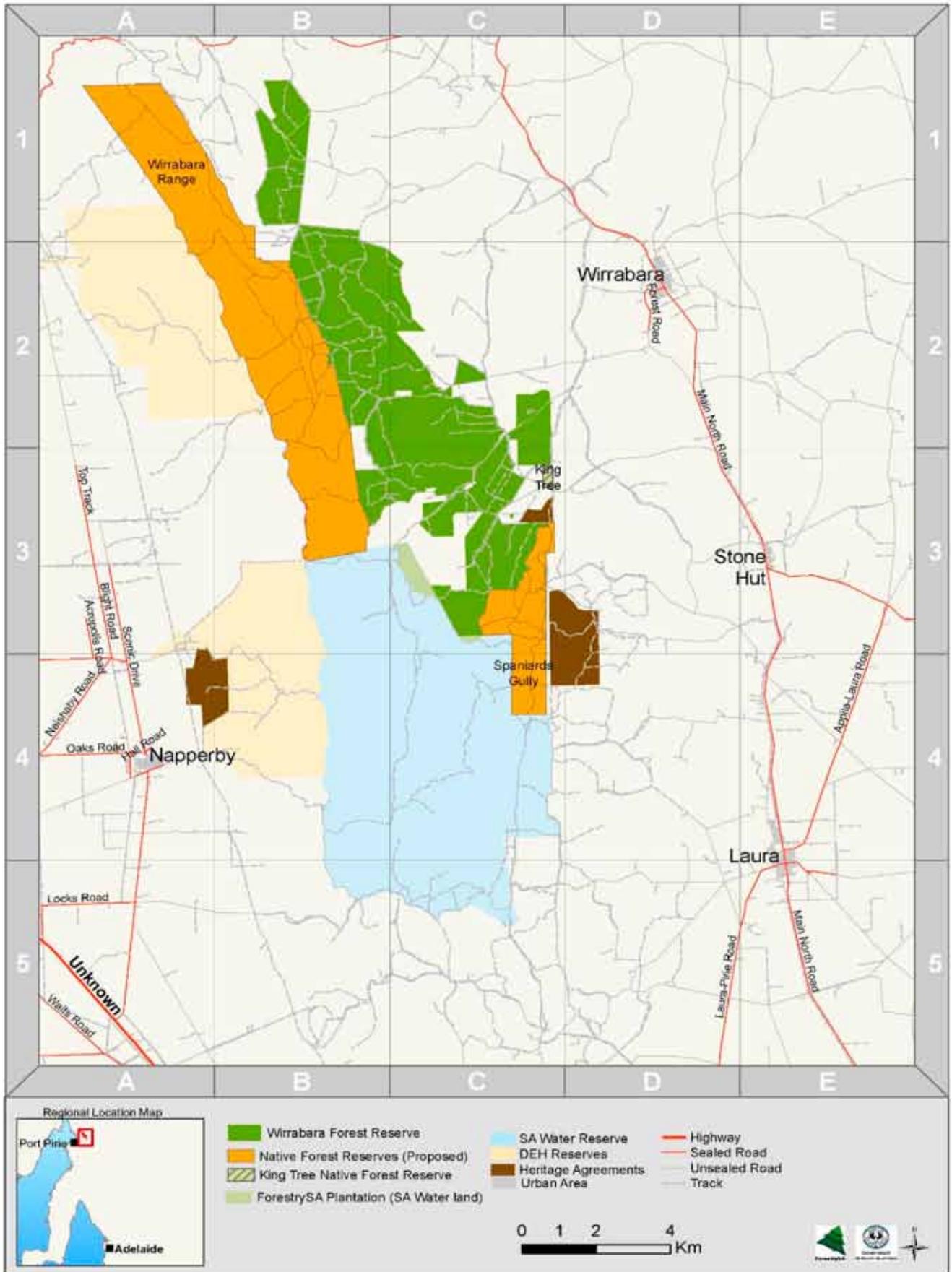


Figure 1 - Location Map - Wirrabara Forest Reserve & NFNRs

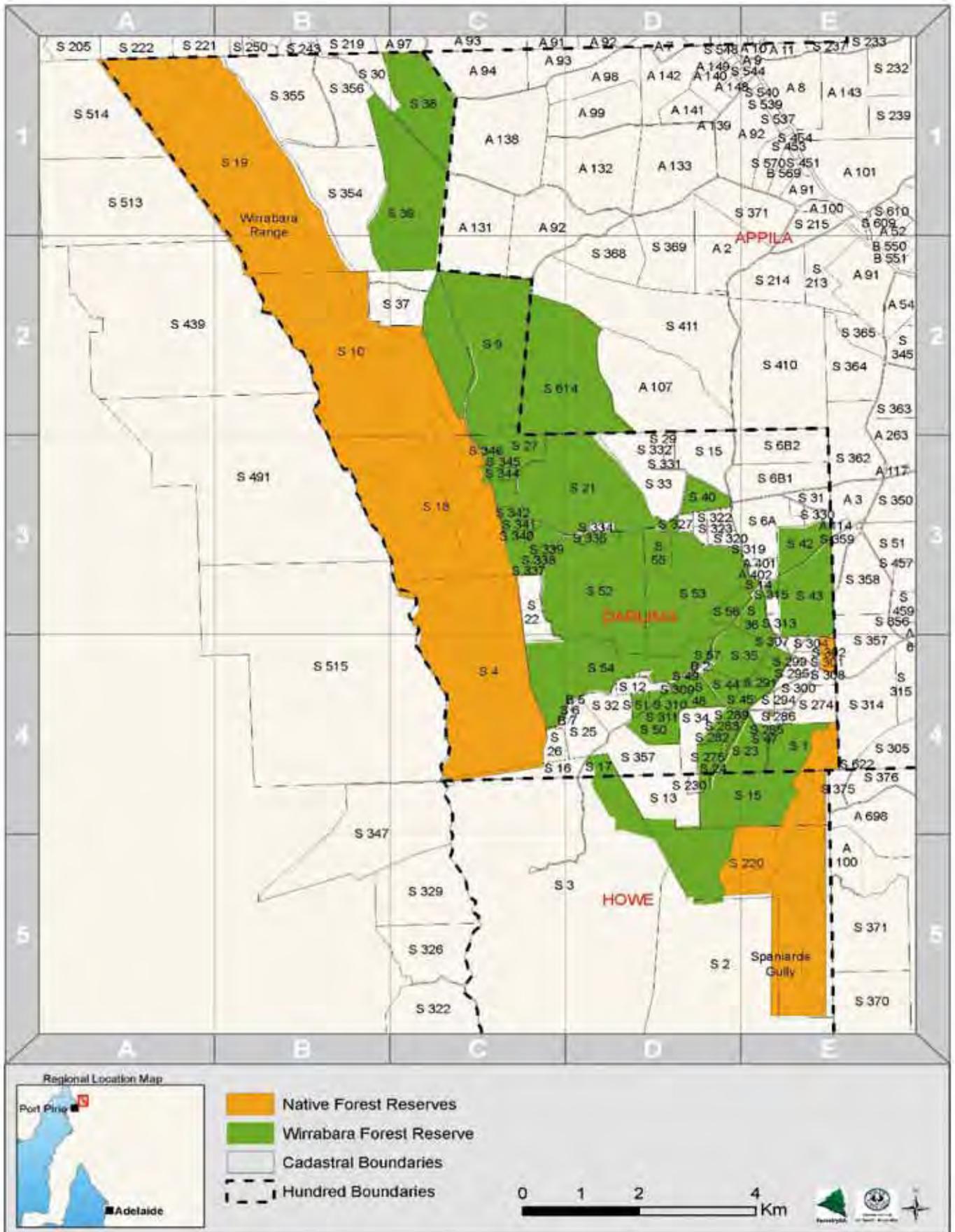


Figure 2 - Cadastral and Hundred Boundaries

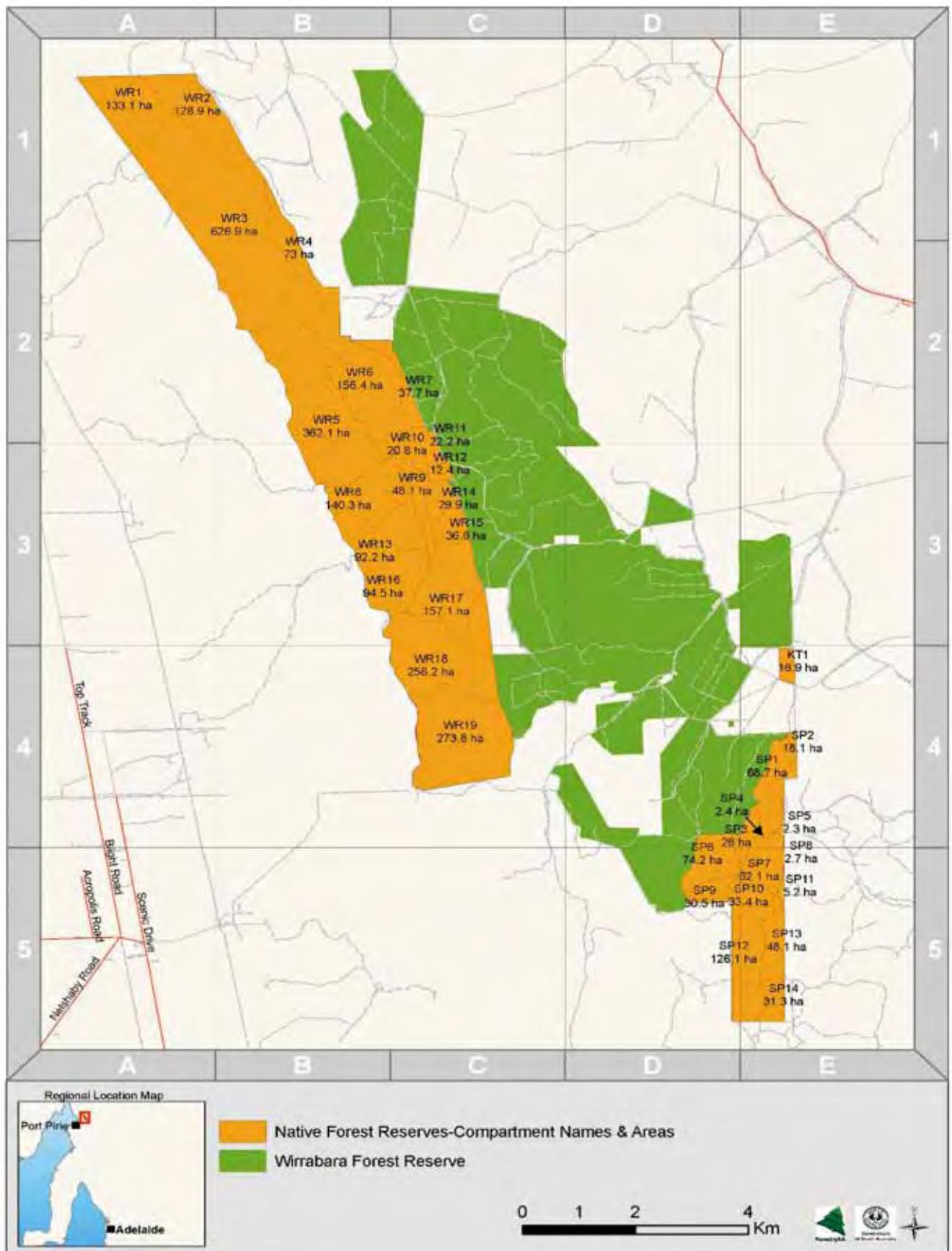


Figure 3 - Compartment Names & Areas

Introduction cont.

Native Vegetation Management Objectives

ForestrySA manages some of the few remnant areas of native forest, woodland and wetland predominantly in the higher rainfall areas of South Australia. These areas contribute significantly to the natural assets of the State and have been managed as Forest Reserves under the *Forestry Act 1950* by the former Woods and Forests Department (now ForestrySA) which was established in 1882.

ForestrySA's primary management objective for areas of native forest under its control is to conserve and enhance native flora and fauna, and preserve biodiversity for the long-term benefit of the South Australian community.

In managing native forests, ForestrySA:

- > recognises that the size and relative isolation of many native forest reserves increases the risk of species loss due to fire, drought or disease, where isolation is a barrier to re-colonisation;
- > recognises that native forest reserves contribute to the conservation of valuable remnant habitats for many species and provide, in part, a representation of land cover before clearance and other changes following European settlement;
- > recognises ecosystems are dynamic and will continue to change with time;
- > will make decisions for the management of ecosystems, communities and processes, based on the information available;
- > will use the least disturbed sites as benchmark areas to monitor changes due to natural succession, and as reference sites for restoration of adjacent disturbed areas;
- > will vary management programs, as required, to maximise biological diversity; and
- > will encourage co-ordination with neighbouring landowners (private individuals, Local Government and other Government agencies) to maximise the conservation value of an area.

Prior to the early 1950s, most forest reserves were disturbed by activities such as timber cutting, grazing, mining, fire and invasion by introduced plants and animals. Since then, most of these areas have remained relatively undisturbed. Compared with other remnant areas of native vegetation in South Australia, those managed by ForestrySA are often less disturbed due to their long history of consistent land tenure.

Areas of native vegetation may require specific management prescriptions to achieve management objectives, depending upon their disturbance histories. ForestrySA is committed to the following broad management objectives for the native forests under its control for the benefit of the people of South Australia:

- > Conservation Management - reserves will be managed for the long-term conservation of native plant and animal communities, and will incorporate research and monitoring. Natural processes will be maintained by the use of approved prescribed burning when and where appropriate.
- > Community Use - community use of areas will be managed consistent with the reserve's primary conservation purpose, and understanding and awareness of the reserve's natural values will be promoted.
- > Protection - reserves will be managed to minimise impacts from human-induced or natural disturbances.
- > Rehabilitation - sites that have been extensively degraded by human - induced or natural activity will be rehabilitated.
- > Stakeholder Involvement - community groups and volunteers (through ForestrySA's Friends of the Forests program) that can contribute to the implementation of the management program will be identified, and their involvement facilitated. Integrated planning and management will be promoted.

Introduction cont.

Regional Management Framework

There are numerous regional conservation strategies relevant to the management of the NFNFR's, including:

- > Northern and Yorke Regional NRM Plan; (Northern and Yorke NRM Board, 2009). This Plan defines an integrated vision for the future of natural resources in the Northern and Yorke region and documents strategies and actions to see the vision achieved. A draft plan was completed in late 2008 and the Minister adopted the final plan in March 2009. Further information is available at: <http://www.nynrm.sa.gov.au/OurPlans/StrategicPlans/tabid/383/Default.aspx>.
- > NatureLinks; South Australia's Strategic Plan contains a target to have five well established biodiversity corridors aimed at maximising ecological outcomes particularly in the face of climate change (Government of South Australia, 2008). Wirrabara Forest is within the Flinders-Olary NatureLink, extending from the southern Flinders Ranges to the north to the Flinders and Gammon Ranges, and north-east to the Olary Ranges. The Flinders-Olary NatureLink Plan was released in 2010. It represents the first stage in focussing conservation efforts in the region involving all stakeholders. NatureLinks is a central component of the South Australian Government's 'No Species Loss Strategy', the aim of which is to minimise the decline of our biodiversity. Further information is available online at <http://www.environment.sa.gov.au/naturelinks/pdfs/fo-plan.pdf>.
- > Biodiversity Plan for the Northern Agricultural Districts of SA; (Dept. for Environment & Heritage, 2001). Regional Biodiversity Plans provide biodiversity information for a region including threatened species, threatened plant communities, threats to biodiversity, significant habitats and key biodiversity areas. They are developed in consultation with the community and are a strategic framework for conservation of biodiversity in a region with biodiversity values, targets, performance criteria, and priority actions and outcomes identified. The plan is available from the Department of Environment & Natural Resources (formerly Department for Environment & Heritage).

Natural Resources

Climate

The area is typically characterised by cold wet winters and dry hot summers. Average summer temperatures are 31°C, with day temperatures over 35°C common. Frosts are most frequent from June to August. Average yearly rainfall is between 400mm and 600mm, with most rain falling from April to October. Intermittent summer rains occur in this area under the influence of moisture accumulating from Spencer Gulf, and precipitation caused by the topography and elevation of the Wirrabara Ranges. Detailed climatological information is available on the Bureau of Meteorology website (<http://www.bom.gov.au>).

Physical Environment

Geomorphology and Soils

The Flinders Ranges are part of a complex ancient mountain range, which formed more than 450 million years ago. The bulk of the outcrop is related to the sediments of the Adelaide Geosyncline, a narrow elongate basin that stretches from the Fleurieu Peninsula to the Peake and Denison Ranges, northwest of Maree (Lemon, 1996). The Wirrabara Forest Reserve is part of the South Flinders Zone, which comprises relatively tight north-south folds (Lemon, 1996). The rocks of the South Flinders Zone are known as the Burra Group. Continuous weathering and erosion has exposed high sandstone and quartzite ridges resulting in spectacular scenery with steep rugged gorges, most evident in the Wirrabara Range. The soils in the steep rocky areas are generally skeletal and podsollic with low phosphorus levels. Lower slopes can have hard red-brown texture contrast soils (typically loam over clay) with highly calcareous lower subsoils.

Spaniards Gully and King Tree NFR are characterised by intermittent streams in valley floors, with moderately deep, red duplex soils that are well drained. These features characterise areas that are quite fertile. King Tree NFR is an uncommon remnant of the eucalypt woodlands and associated species that once evolved in these moister and fertile sites. Charcoal Creek and associated tributaries pass through Spaniards Gully and King Tree NFR and flow north-eastward to join the Ippinitchie Creek. The presence of these drainage systems ensures that the reserves receive and retain moisture from even small rainfall events.

Hydrology

Most of the reserves are within the Upper Rocky River sub-catchment of the Broughton River catchment, which flows, in an easterly direction to join the Upper Rocky River, which then flows south towards Laura. The River Management Plan for the Broughton Catchment (DWLBC, 2002) outlines the priority management issues for watercourses in the region. The northern section of Wirrabara Range drains to the north-west and is within the Mambray Coast catchment (Figure 4).

The Upper Rocky River has been identified as a priority groundwater basin (Northern & Yorke NRM Board, 2009) and permits are required for any water affecting activities.

Petroleum and Mining Resources

The *Petroleum Act 2000* and the *Mining Act 1971* regulate all activities relating to exploration and production. In regard to flora and fauna there are requirements to avoid, or where not reasonably practicable, minimise environmental impacts. In this regard, impacts to native vegetation are permitted without requirement of consent under the *Native Vegetation Act 1991*.

The *Mining Act 1971* states, in regards to Forest Reserves:

9. (1) Subject to this section -

(bb) land that constitutes a forest reserve under the *Forestry Act 1950*;

shall be exempt from mining operations in pursuance of this Act and, unless the land ceases to be so exempt, no miners right, claim, lease or licence shall authorise prospecting, exploring or mining upon such land (but this section does not prevent the pegging out of a claim upon such land).

The *Petroleum Act 2000* is different in that Forest Reserves are not exempt, however the Minister for Mineral Resources and Energy is required to determine the conditions subject to which an Exploration Licence is granted, and proper consideration must be given to the protection of flora and fauna. Upon receiving a notice of intent to enter land, the landholder has a 21 day period whereby any objection can be taken into consideration. For these areas to be surveyed, permission will be granted on the terms of using existing tracks only, and only after a thorough flora and fauna survey is undertaken on any area and track planned to be surveyed.

Mineral Exploration Licences (EL) 2828 and EL 2944 exist over Wirrabara Range. There are no Petroleum Exploration Licences currently existing over any of the forest reserves. Exploration and mining licence information can change regularly. Up to date information is available at the South Australian Resources Information Geoserver available online at: <https://info.pir.sa.gov.au/geoserver/sarig/frameSet.jsp>

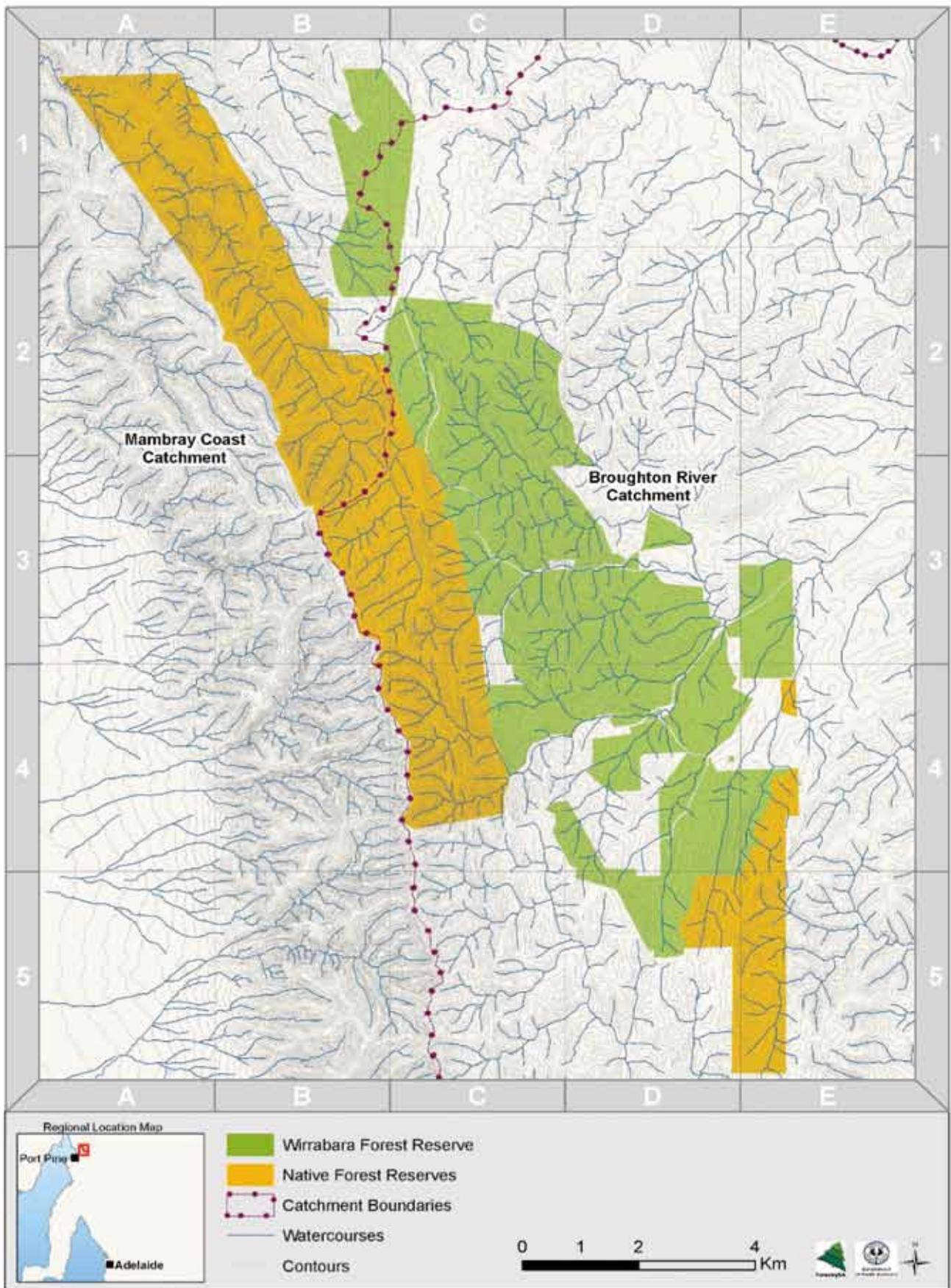


Figure 4 - Drainage and Topography

Natural Resources cont.

Natural Environment

Biological information for forest reserves is available from various surveys that have been undertaken predominately by the Department of Environment & Natural Resources (DENR, formerly DEH) as part of the Biological Survey of South Australia. This survey data provides a botanical snapshot for specific sites but does not adequately reflect all of the biodiversity values that may be present in forest reserves. Details of individual biological survey sites can be viewed at the DENR 'Nature Maps Spatial Browser' available online at <http://www.naturemaps.sa.gov.au>. Other significant biological information is available from the Beetaloo Valley biological survey that included survey sites in the southern portion of Spaniards Gully (Philpott, 2001) and other surveys undertaken by ForestrySA staff and/or student projects.

Native Vegetation

The forest reserves are within the Flinders Lofty Bioregion. The Interim Biogeographic Regionalisation for Australia (IBRA) divides the Australian continent into 85 bioregions and 404 sub-regions based on major geomorphic features in each bioregion (Department for Environment and Heritage, 2005). The bioregions are the reporting unit for assessing the status of native ecosystems, their protection in the national reserve system and for use in the monitoring and evaluation framework in the Australian Government's current natural resource management initiatives. The remnant vegetation protected within the forest reserves contributes significantly towards biodiversity conservation in the region where less than 7% of the area is conserved by dedication as protected areas (Department for Environment and Heritage, 2001).

Botanical regions are defined to delineate native vegetation communities and floristic composition based on different geographic areas. The forest reserves are within the Northern Lofty (NL) botanical region. The northern section of Wirrabara Range NFR is adjacent to the Flinders Ranges botanical region to the north therefore the vegetation here often reflects an 'overlap' zone between the two botanical regions.

Broad vegetation association mapping was undertaken in January 2009 in Wirrabara Range, Spaniards Gully and King Tree (Figure 5). The exercise involved driving along all the forest tracks within the reserves and taking GPS point information at intervals noting any changes in vegetation communities and recording any changes in understorey density and composition. Any unusual understorey plant species were also recorded. Aerial imagery was also used to identify any obvious changes in vegetation types.

Priority vegetation associations known in the Native Forest Reserves are:

- > Grey box (*Eucalyptus microcarpa*) Woodlands – rated as Priority 4 (Neagle, 1995) and Endangered for the State (DEH, 2001). Small areas located in the lower slopes of the central eastern section of Wirrabara Range. Further surveying and expert identification of the eucalypt species is required due to possible hybridisation with other eucalypt species. Grey box is also present in King Tree NFR.
- > Peppermint box (*E.odorata*) Woodland – rated as Priority 3 (Neagle, 1995). Small areas within King Tree and Spaniards Gully. Peppermint box grassy woodland communities are listed as Critically Endangered under the EPBC Act 1999, however due to the degraded nature of the understorey it is unlikely that these areas would qualify. An area of *E.odorata* grassy woodland within B South locality, south-east of the Wirrabara Range, warrants further surveying and investigation for protection under the Act.
- > Sugar gum (*E. cladocalyx*) Forests with Long-leaf box (*E. goniocalyx*) and Blue gum (*E. leucoxydon*) – a plant community that is endemic to the Southern Flinders Ranges. This community dominates in Wirrabara Range. Many of the Sugar gums are significant habitat trees due to their size and age and presence of hollows. Long-leaf box is absent in Spaniards Gully where Sugar gum and Blue gum dominate.
- > White box (*E. albens*) is a geographically isolated species of regional significance. Records indicate the presence of White box in Wirrabara Forest Reserve, however due to possible cross fertilisation with other eucalypts it is difficult to confidently identify the species. It is likely to be present in the lower slopes of the central eastern section of Wirrabara Range with Grey box.

Flora surveys were conducted in September 2009 by ForestrySA and members of the Native Orchid Society of SA (NOSSA) in all of the NFR's and in other areas of the Wirrabara Forest Reserve. This survey discovered some species that were previously not recorded for the Northern Lofty region, including weed species, found a number of currently undescribed flora species and clarified or refined the known extent, range and populations of many plants of conservation significance. As a result of the survey alterations may be made to the conservation ratings of some plant species (Bates, 2009) highlighting the importance of periodic surveying to enhance regional knowledge on plant populations (Plates 1-4).

Natural Resources cont.



Plate 1 - *Arachnorchis leptochila* (Narrow-lip spider-orchid), currently rated as vulnerable for the region, was found in large numbers. Photo: B. Bayley.



Plate 3 - *Corysanthes diemenicus*, an uncommon species in the region and likely to be the northern extent for the species in The Range. Photo: R. Bates.



Plate 2 - *Arachnorchis saxatilis* (Rock spider-orchid), a recently described orchid species, was also abundant. Photo: B. Bayley



Plate 4 - *Wurmbea biglandulosa* ssp. *flindersica*, a species restricted to the Mid North region, but very abundant in Wirrabara NFR's. Photo: R. Bates.

Natural Resources cont.

The flora species list in Appendix 1 includes the updated information, which has significantly increased the number of flora species previously recorded in the NFNFR's. A total of 449 native plant species have been identified within the NFNFR's; 1 species with a national conservation rating; 19 species have a conservation rating for the State and 114 species have conservation ratings for the Northern Lofty region (Appendix 1).

An additional 49 native flora species were surveyed in areas outside of the NFNFR's, including 1 species, *Glycine latrobeana* (Clover glycine) which is rated as Nationally Vulnerable, plus 8 species with a state conservation rating and 11 species with a conservation rating for the Northern Lofty region (Appendix 1A). Flora data for forest reserves are maintained on a ForestrySA database.

Wirrabara Range

Wirrabara Range consists of open forests and woodlands generally with a dense shrub understorey. Dominant overstorey species are eucalypts-either Sugar gum, Blue gum or Long-leaf box with varying combinations of dominance between the different eucalypt species (Plates 5-8). Occasionally there are small pockets of pure stands of *Allocasuarina verticillata* (Drooping sheoak) and *Callitris gracilis* (Southern Cypress pine), which can also be found as a co-dominant overstorey species with Eucalypts in low woodlands. Boomsa (1946) noted that natural changes in vegetation associations are frequent and relate to changes in formation, alterations in the frequency of dominant species and alterations in the growth habit of dominant species (stunted growth on skeletal soils, exposed slopes). The soil moisture relationship was also noted to be critical with pockets of Red gum (*E. camaldulensis*) persisting on riparian flats and even on upper slopes with skeletal soils where permanent springs are present.

Dominant understorey species include *Acacia wattsoniana* (Dog wattle), *Cassinia* spp. (Curry bush), *Xanthorrhoea quadrangulata* (Rock grass tree) and *Astroloma humifusum* (Cranberry heath).



Plate 5 - Long box/Blue gum woodland over dog wattle



Plate 6 - Blue gum/Sheoak woodland over heath

Natural Resources cont.



Plate 7 - Long box/Sugar gum open woodland over dense heath and yacca



Plate 8 - Grey box woodland over dog wattle



Plate 9 - *Jonesiopsis flaccida* (Daddy-long-legs spider orchid) in The Range. Photo: B. Bayley

Long-leaf box generally prefers higher altitudes on rocky, infertile soils (Greening Australia, 2006). It occurs as a coarsely branched tree up to 13m high on the ridges to a taller straight tree up to 16m on lower slopes (Woods & Forest Dept., nd). Long-leaf box has been predominately recorded at altitudes from 400m to 700m mixed with either Blue gum or Sugar gum or occurring with both. There are also scattered occurrences at lower altitudes with Red gum (Woods and Forest., nd).

Small areas of Grey box persist in the central eastern section of Wirrabara Range within the NFR and outside in Conservation Zone. There is early observation by Boomsa & Lewis of Grey box crossing with other gums - "Grey box often merges with accompanying tree species in a woodland of boxes and gums" (Woods & Forest Dept., nd). It generally occurs on better soils and therefore has been disproportionately cleared throughout the region for agricultural production.

Spaniards Gully

Spaniards Gully consists of open forests and woodlands dominated by Blue gum and Sugar gum mainly over a heath understorey. Dominant understorey shrub species include *Calytrix tetragona*, (Fringe myrtle), *Acacia wattiana* (Dog wattle) and *Xanthorrhoea quadrangulata* (Rock grass tree) (Plates 11-12) The structural diversity within the reserve comes from the variations and densities in the understorey species and occasionally Drooping sheoak and Southern cypress pine are abundant as a second overstorey species. Blue gum and Sugar gum are generally co-dominant however there are areas where either one species may be absent or more dominant. Other vegetation associations include small areas of *E. odorata* (Peppermint box) and *E. socialis* (Red mallee), the latter found on a limestone ridge in the north-west of the reserve.

The first major biological survey within Spaniards Gully was undertaken in 2001 as part of the Beetaloo Valley survey initiated by the Nature Conservation Society of South Australia (NCSA). Three survey sites were established in Spaniards Gully (BEE01401; BEE01501; BEE01601). The survey information was added to the Biological Survey Database of South Australia and is available online at NatureMaps (<http://www.naturemaps.sa.gov.au>).

The Nationally Vulnerable species, *Olearia pannosa* ssp. *pannosa* (Silver daisy bush) was found during the spring 2009 survey just on the Spaniards Gully NFR boundary in an area with limestone soils on the north-west edge of the reserve.

Natural Resources cont.

King Tree

In 1996, a biological survey of grasslands and grassy woodlands was undertaken by DENR of the Lofty Block Bioregion of South Australia. This survey incorporated two survey sites within the northern section of King Tree NFR (LBGPIR01 and LBGPIR06). Information on these specific survey sites can be found online at NatureMaps (<http://www.naturemaps.sa.gov.au>).

The reserve is predominately an area of open woodland with grassy understorey (Plate 13), dominated by Red gum and Blue gum with occurrences of Grey box and Peppermint Gum low woodland. Understorey species include *Bursaria spinosa* (Christmas bush), numerous species of *Austrodanthonia* (Wallaby grass) and *Austrostipa* (Spear grass) and *Gonocarpus elatus* (Raspwort). The survey in 2009 found flora species previously unknown from the reserve including, *Isolepis australiensis* (Southern club rush), *Carex inversa* (Knob sedge) and *Mentha satuireioides* (Native pennyroyal).

King Tree NFR comprises high quality remnants of grassy woodland communities poorly conserved in the Southern Flinders Ranges (DEH, 1996). The reserve is also a unique remnant of eucalypt species once widespread throughout the region, particularly in the more fertile areas. *E. microcarpa*, *E. leucoxylon* and *E. camaldulensis* are found in close proximity, extending from the more elevated sites to the moister creek bed. The occurrence of these species in the Southern Flinders Ranges was documented by Boomsma in 1946.

Many of the eucalypts present in the reserve are large, mature trees, similar to those originally described by Boomsma (1946). Many of these trees contain hollows of varying sizes, making the area an important nesting and breeding site for hollow-dependent fauna (Plate 14).

King Tree NFR takes its name from the "King Tree", a large redgum, estimated to be more than 400 years old (Plate 15). The King Tree was photographed in 1907 and appeared in the Woods and Forests Department Annual Report for that year (Plate 16). In 1907 it was measured as 36.5m tall, 11.35m in circumference at its base, and 3m in diameter at chest height. The King Tree today shows signs of dieback in the canopy which could just be natural senescence or be exacerbated by recent droughts.



Plate 10 - *Pheladenia deformis* (Blue fairies) in The Range.
Photo: B. Bayley



Plate 11 - Sugar gum open woodland over rock grass trees



Plate 12 - Blue gum woodland with sparse heath understorey

Natural Resources cont.



Plate 13 - King Tree grassy woodland



Plate 14 - Large Red gum with hollows



*Plate 15 - The King Tree today with evidence of dieback.
Photo: B.Bayley*

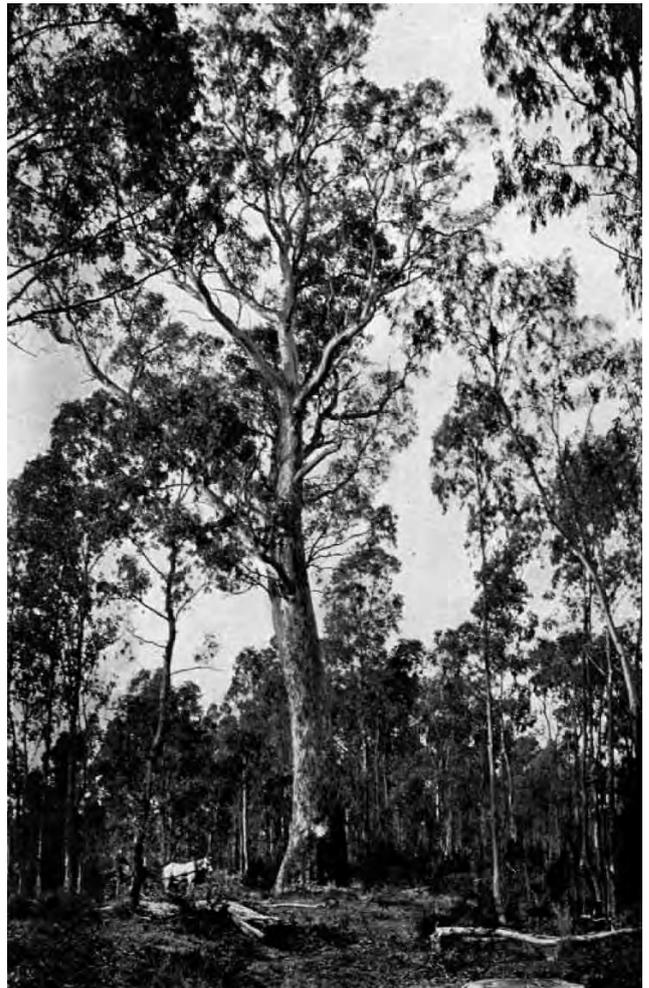


Plate 16 - A more robust King Tree in 1907. Photo: A. Gill

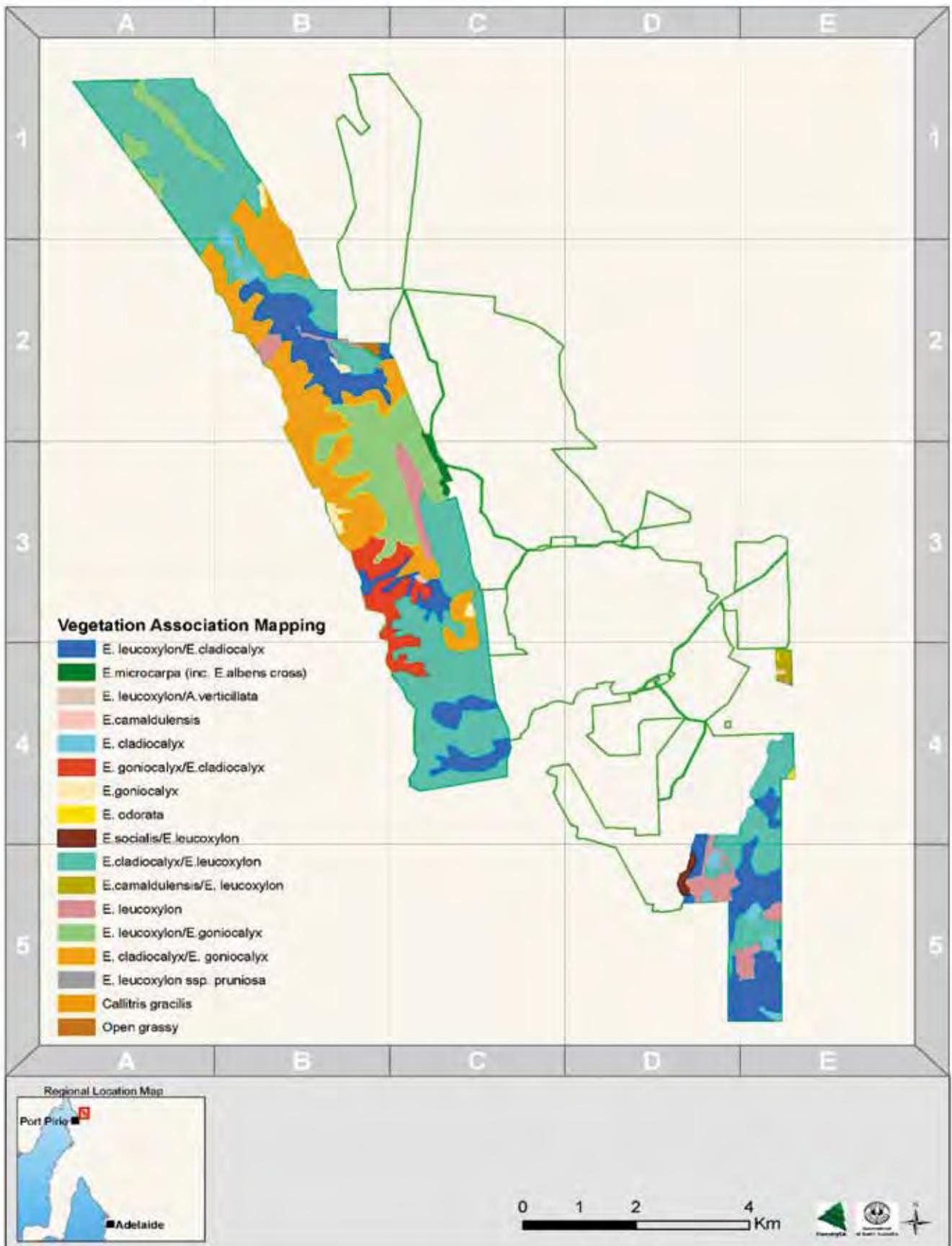


Figure 5 - Vegetation Associations

Natural Resources cont.



Plate 17 - *Pinus radiata* trial planting site in Wirrabara Range



Plate 18 - *Scabiosa* invading from roadside at south-west end of King Tree

Introduced Plants

The NFNFR's contain a number of highly invasive woody weed species, introduced pasture grasses and herbaceous plants, which impede growth and regeneration of native plant species (Appendix 1). Some weed mapping was done while undertaking the vegetation association mapping in 2009 and locations are recorded and managed on ForestrySA GIS and are continually updated.

Aleppo pine (*Pinus halepensis*), one of the most drought-tolerant pines and invasive species, was introduced to the region in the late 1800s, when forest management began planting trials at Wirrabara. Aleppo pine was also utilised by landholders and local Councils as windbreaks or roadside plantings. Large infestations of Aleppo pine currently occur in the north-east of Wirrabara Range and in the central section of Spaniards Gully. Radiata pine (*Pinus radiata*) occurs as scattered mature trees and seedlings throughout all of the reserves particularly in areas that abut commercial pine plantations. In the central southern section of Wirrabara Range there is a historic trial planting of radiata pine surrounded by intact Blue gum woodland (Plate 17). These trial areas were planted to assess the suitability of sites for growth of pine. This site requires monitoring for spread of young pine into the adjacent bushland and the mature pines should be progressively controlled as resources allow. Physical removal of the trees would be difficult and expensive and potentially damage surrounding native vegetation.

Olives (*Olea europaea*) are a priority weed to control as they are relatively low in number throughout the NFNFR's but have the potential to spread and impact on biodiversity values and increase fire fuel loads. Olive densities are greater outside of the NFNFR's so there is potential for continual spread into the bushland of the native forest reserves. Seeds are spread and can be carried for long distances by birds and foxes.

Bridal creeper (*Myrsiphyllum asparagoides*) is a high priority for control within the NFNFR's. Bridal creeper is an aggressive and highly invasive species, capable of surviving hot, dry conditions as dormant rhizomes and tubers. It is as a Weed of National Significance (WONS), which describes a national classification used to describe weeds that are highly invasive, have potential to rapidly spread and impact significantly on environmental values. Bridal creeper is present in King Tree NFR and in plantation and riparian areas adjacent to Wirrabara Range. Bates (2009) observed bridal veil (*Asparagus declinatus*) on road side adjacent to King Tree NFR which is a priority for removal.

In King Tree NFR, while woody weeds like desert ash (*Fraxinus rotundifolia*), olives and wild pine are a high priority for control, invasive herbaceous weeds like one-leaf cape tulip (*Moraea flaccida*) and scabiosa (*Scabiosa atropurpurea*) impact on the integrity of the native grassy understorey and require annual attention (Plate 18).

Natural Resources cont.

Fauna

Birds

Sixty-eight species of bird have been identified in the NFNFR's, including four species with high conservation significance in South Australia - Bassian thrush (*Zoothera lunulata*), Chestnut-rumped heathwren (*Calamanthus pyrrhopygius*), Diamond firetail (*Stagonopleura guttata*) and the Painted button-quail (*Turnix varia*) (Appendix 2).

The Bassian thrush, which is threatened in the Mount Lofty Ranges, has isolated populations in the Southern Flinders Ranges with records from Wirrabara Range and Mount Remarkable. The Chestnut-rumped heathwren is an isolated sub-species in the Mount Lofty and Southern Flinders Ranges, described as *Calamanthus pyrrhopygius* ssp. *pedleri* (Schodde and Mason, 1999 in Brandle 2001). This sub-species is endemic to the Southern Flinders Ranges. All but four of 50 records for the diamond firetail stored in the Atlas of Australian Birds Database for the Flinders Ranges, occur in the Southern Flinders. The DENR Biological Survey of the Flinders Ranges (1997-1999) detected this species at three sites in the Southern Flinders, one being from Wirrabara Range NFR. Similarly, the Painted button-quail was recorded from three survey sites and in Wirrabara Range NFR.

The bird list for the NFNFR's was updated in late spring 2009. The survey added seven more species to the previous lists including, *Glyciphila melanops* (Tawny-crowned honeyeater) and *Melithreptus lunatus* (White-naped honeyeater), both considered to be species in decline and rated as Uncommon for the region.

Species such as the Yellow-faced honeyeater (*Lichenostomus chrysops*), Laughing kookaburra (*Dacelo novaeguineae*) and Scarlet robin (*Petroica boodang boodang*) have their northern distribution limits in the Southern Flinders Ranges. The Elegant parrot (*Neophema elegans*), a "poorly known" or "uncertain" species in South Australia, is considered to have a limited distribution for which the Flinders Ranges provide a major breeding area.

Mammals

This area of the Southern Flinders Ranges is known to support a diverse range of fauna (Kaczan 1981; Royal Society of South Australia 1996; Brandle 2001; Philpott 2001), including species of state and regional conservation significance.

Fourteen mammal species have been identified within the NFNFR's (Appendix 2). The discovery of the desert mouse (*Pseudomys desertor*) in Wirrabara Range during the 2001 DENR biological survey was a surprising mammal discovery. The nearest records of the species come from 300km north-east near Roxby Downs. Trapping was undertaken in Wirrabara Range in 2006 by ForestrySA and DENR but the desert mouse was not trapped. However, subsequent trapping by DENR later in 2006 in adjacent Telowie Gorge Conservation Park was successful with

six individuals being trapped. These results are enough to validate their presence in the region and to set up a monitoring grid to further investigate the species range and microhabitat requirements (pers. comm. Narissa Haby, 2007).

The current status of the brushtail possum in the Southern Flinders Ranges is rated as rare, occurring only in fragmented populations (Kemper and Foulkes 1997; cited in Brandle 2001). Brushtail possums (*Trichosurus vulpecular*) were not evident during the 1997-1999 Flinders Ranges survey and now appear to be restricted to the eastern footslopes of the southern ranges in remnant open eucalypt woodlands, or associated with the towns of Melrose, Wilmington and Quorn. All surviving populations near towns appear to be in decline (with the exception of the Wilmington populations which fed by the caravan park owners). Brandle (2001) suggests that the vulnerability of these fragmented populations to extinction is high, and that research to assess the extent of these populations and the causes of their decline is imperative for the long-term conservation of this species outside metropolitan Adelaide. The brushtail possum was recorded in Spaniards Gully during the 2001 Beetaloo Valley survey. This was a significant record within the survey area as it is close to the northern extreme of its current known distribution in South Australia.

The ringtail possum (*Psuedocheirus peregrinus*) has not been detected from recent surveys throughout the region and the last records are from 1980. Due to the large area of potentially suitable habitat it is likely to still be present in the region but the species is considered to be uncommon and declining (Aitkin in Corbett, 1980).

The yellow-footed rock-wallaby (*Petrogal xanthopus*) was an abundant animal in the Flinders Ranges at the time of European settlement (Copley, 1981). It is now rated as vulnerable under both the *National Parks and Wildlife Act* (SA) 1972 and the *Commonwealth Environment Protection and Biodiversity Conservation Act* 1999. It has been recorded in the adjacent Telowie Gorge Conservation Park and may occur in the Wirrabara Range as there are records from 1975 of observations in the vicinity of The Bluff in the south-west corner of Wirrabara Range.

Bat monitoring occurred during the 1997-1999 Flinders Ranges survey in Wirrabara Range. Bats were sampled non-systematically by setting harp traps or mist nets (Brandle 2001). Further surveying using 'Anabat' recorders was done by DENR and ForestrySA in 2006 during the desert mouse surveys.

Natural Resources cont.



Plate 19 - Tree goanna near Wirrabara office.
Photo: S. Wenham

Reptiles and Amphibians

Twenty two species of reptile and amphibians have been recorded for the reserve (Appendix 2). The Adelaide snake-lizard (*Delma mollerii*) has been recorded in Wirrabara Range. This species is endemic to South Australia, with limited distribution in the Mount Lofty and Olary Ranges and Yorke Peninsula. The brown tree frog (*Litoria ewingi*), at its northern limits in the Southern Flinders Ranges and the streambank froglet (*Crinia riparia*), endemic to the Flinders Ranges, have also been recorded in Wirrabara Range.

The southern rock dtella (*Gehyra lazelli*) is a form of gecko that is also endemic to South Australia and has been recorded in Wirrabara Range.

The tree goanna (*Varanus varius*) is considered rare in South Australia. The Southern Flinders Ranges population of the tree goanna is isolated from the main population, which occurs throughout much of the Great Dividing Range on the east coast of Australia, extending along the riverine woodland of the Murray-Darling river system into eastern South Australia. It is more than 200km from the upper reaches of the Murray River, generally to the east of Loxton, where the tree goanna is known to occur, to the Southern Flinders ranges population. There are numerous records of the tree goanna occurring in Wirrabara Range and Spaniards Gully. There is a large 'resident' goanna that regularly frequents the area surrounding the Wirrabara Forest Office (Plate 19).

Natural Resources cont.

Introduced Animals

There are numerous species of introduced animals throughout the reserves (Appendix 2), including Cats (*Felis catus*), Foxes (*Vulpes vulpes*), Black rat (*Rattus rattus*), House mouse (*Mus musculus*), Goats (*Capra hircus*), Red deer (*Cervus elaphus*), Fallow deer (*Cervus dama*), Hares (*Lepus capensis*) and Rabbits (*Oryctolagus cuniculus*).

Cats, although less readily observed, are widespread in the Flinders Ranges and most likely to shelter in gullies and creeklines during the day. Foxes were established throughout the Flinders Ranges by 1910 (Aitken, 1980) and occur throughout the management area. Goats are also common in the region, occupying all habitats but concentrated on the high ridges and gorges.

Deer can cause damage to native vegetation from browsing and trampling. During the rutting season (late summer-autumn) saplings or tall shrubs with stem diameter 3-5 cms, are often ringbarked or broken off by bucks. A major concern is the potential for feral deer to act as carriers for livestock diseases.

Competition and land degradation by goats, rabbits and predation by the foxes have been identified as key threatening processes under the EPBC Act 1999. Key threatening processes may threaten the survival, abundance or evolutionary development of a native species or ecological community. Threat abatement plans have been developed for key threatening processes which guide the national management framework. For more information online visit <http://www.environment.gov.au/biodiversity/threatened/ktp.html>

Goats are subject to on-going control programs in the reserves and control efforts in Wirrabara Range are coordinated with DENR where possible. Deer control is managed internally and since 1999 over 520 deer have been controlled. Fox baiting programs are generally implemented annually between February and April. ForestrySA ensures ongoing review and evaluation of pest management and control strategies.

Native animal grazing pressure is managed by DENR. Landholders surrounding the forest reserves can seek permits from DENR for control to lessen impacts on grazing and biodiversity values. ForestrySA has participated in regional control programs and will continue to monitor native grazing pressure in consultation with DENR.

Introduced Disease

Phytophthora cinnamomi (Pc) is a soil borne microscopic water mould. It grows in a thread-like fashion through the roots and trunks of infected plants. The only outward sign of its presence is sickness, or death, of the infected plant. Infestation is permanent – spores are long-lived and can remain dormant in cool, dry soils, until conditions are right for fungal growth. It is dispersed by water and other vectors, such as native animals, vehicles and bushwalkers. Yaccas and banksias are particularly sensitive and have been regarded as indicator species, but Pc also impacts on some exotic plant species. There is no current cure for Pc, nor is there any known way of stopping its spread once it has infested an area. Areas within South Australia that receive annual rainfall above 400mm are potentially at risk from Pc. Currently there are no known confirmed infestations of Pc in the Wirrabara area and the areas surrounding Wirrabara are deemed to be a moderate risk for Pc. The adoption of general hygiene management strategies can minimise the introduction and spread of Pc, especially for high risk activities like earth work during wet conditions and machinery transfer from known infected areas within Mount Crawford and Kuitpo Forest Reserves.

More information can be obtained from the publication, "Phytophthora Management Guidelines" (2006) available at www.environment.sa.gov.au/biodiversity/pdfs/phytophthora.pdf

Other Threats

Grazing by domestic stock is not permitted in native forest reserves, however it does occur, under lease agreements with adjoining landholders, in conservation zones within Wirrabara Forest Reserve. The Northern Forests Forest Management Plan (2008) recommends a review of these grazing leases to minimise impacts on biodiversity values. Parts of the Wirrabara Range NFR are adjacent to private grazing land and there are regular incursions of domestic stock into the native forest reserve due to damaged fencing. There are extensive boundary areas in Wirrabara Range that abut grazing land and it is extremely difficult to monitor fence damage and subsequent stock movement from adjoining lands. Much of the fencing is old and in disrepair, however ForestrySA has a program to progressively replace boundary fences where required. Building and sustaining good relationships with local landholders is critical in ensuring that there is no long-term encroachment from stock.

There are numerous licences in place to keep honeybees within Wirrabara Range and Spaniards Gully. Honeybees compete for pollen resources with native bees and can swarm and take over tree hollows and restrict occupation by native species. There is limited research available on the long-term impacts on biodiversity through possible effects on pollination of native flora.

Land Use

History

Indigenous Heritage

The Wirrabara region was originally occupied by the Nukunu people from the Central Language Group (Warrior *et al*, 2005). Wirrabara derives its name from an Aboriginal word meaning 'place of big trees', or 'creek with big trees'. Before settlement by Europeans, the eastern slopes of the Southern Flinders Ranges were called by this name.

The South Australian Government is responsible for the protection and preservation of sites of significance to Aboriginal people. These sites are listed on a Register of Aboriginal Sites and Objects under the *Aboriginal Heritage Act 1988*. The Aboriginal Affairs & Reconciliation Division (Department of the Premier & Cabinet) has confirmed that there are currently no sites recorded on the Register in the NFNFR's. However, the Register is not a comprehensive record of all sites so there may be sites and/or objects present that are not officially listed. It is an offence to damage, disturb or interfere with any Aboriginal site or damage any Aboriginal object without the authority of the Minister for Aboriginal Affairs and Reconciliation.

The Nukunu people have a registered Native Title Claim (SAD6012/98) which includes the areas in and surrounding Wirrabara Forest Reserve. For general information visit the National Native Tribunal website at: www.nntt.gov.au. Advice provided by the Crown Solicitor's Office suggests that it is highly likely that all native title rights and interests have been extinguished for all land parcels in Wirrabara Forest Reserve, however ForestrySA encourages dialogue from the Nukunu people on management issues within the forest estate.

European Heritage

The first plantation in Australia was established at nearby Bundaleer in 1876 when nurseryman William Curnow started planting Tasmanian Blue gums, local Red gums and Sugar gums adjacent to the Jamestown road. The following year a nursery was established in Wirrabara to grow seedlings for planting out in the Wirrabara area in 1878. By 1902 a sawmill at Wirrabara was processing plantation softwood to produce fruit cases and construction timber.

Acquisition and Name

The management area has been under the control of ForestrySA since the late 1800s having previously been part of a pastoral grazing lease. Wirrabara derives its name from an Aboriginal word meaning 'place of big trees'. It is believed that Spaniards Gully was named after Spanish sailors in the late 1800s who, having deserted their ships at Port Pirie, eluded the authorities by hiding in the ranges, where they cut timber to earn a living. King Tree takes its name from the "King Tree", a large River redgum (*Eucalyptus camaldulensis*), estimated to be more than 400 years old. The land tenure history is included in Appendix 3.

Grazing

Sheep grazing has been associated with the Wirrabara Forest region since the early 1900s, but not intensively or continuously. Grazing has not occurred across Wirrabara Range for approximately 70 years, with the exception of Section 19 which was grazed until 1996. Grazing in Spaniards Gully was stopped in 1993. Around 1900, King Tree was resumed from the lessee Jimmy Bowman, to preserve the tree as a "fine example" of a Red gum, with the area being fenced presumably to manage sheep grazing.

Over the intervening years the King Tree NFR was grazed with sheep, but not intensively or continuously, as there is no permanent water supply. Most grazing occurred in winter and spring when water was available from pools in the creek. Due to the absence of a plentiful feed source, sheep numbers were always kept low. Additionally, the area was quite boggy in winter, then dry and sandy in summer. At some time, probably in the 1950s, a small tank and water trough was installed, which allowed grazing to continue. Grazing was intermittent, as the tank had to be filled by water trucked from the forest bore 4km away. Most of this grazing was for short periods when the paddock was used for holding sheep during shearing times.

Timber Utilisation

The Annual Progress Report of the Forest Reserves by John Ednie Brown, Conservator of Forests in 1878, described the early vegetation and noted that the area had already been 'cut over' for timber. In the late 1800s an extensive hardwood timber-cutting industry was established at Wirrabara Forest. This focussed mainly on the eucalypts that grew naturally in the area – River red gum, Sugar gum, South Australia blue gum, Box gum, and also Sheoak. The most abundant species, however, was River red gum, which provided many of the timber products. With the development and extension of railways at this time, a large proportion of the suitable River red gums were cut for railway sleepers.

In the 1900s, the King Tree was set aside and fenced because the tree was too large to be cut into sleepers with the equipment of the time. There is a local story that one pound was offered for the tree and discussions were held with a blacksmith to weld two cross-cut saws together in order to cut the tree down. Two other large, but smaller, Red gums were also set aside in other localities. These were known as the "Queen Trees". These trees are no longer present, although one stump remains in the nearby historic Wirrabara Nursery site.

Wildfire

On January 8, 1960 a large wildfire burnt over 9,000ha in the Wirrabara and Telowie Gorge area. The whole of Wirrabara Range NFR was burnt except for a small section in the north of the reserve. On December 26, 1984 another

Land Use cont.

large wildfire burnt approximately 1,800ha of Wirrabara Range in the central and northern sections, but again the northern tip was not burnt. This fire also extended to the east into the White Park locality. In September 2002 the White Park locality was burnt in a wildfire which was contained to that area. There is no recent wildfire history for Spaniards Gully or King Tree.

Prescribed Burning

The ForestrySA Fire Management Plan (2009) sets out and establishes ForestrySA's approach to fire prevention and management. The Plan and the ForestrySA Policy for Fire Management and the ForestrySA Prescribed Burning Manual (2010) underpin the whole process of fire prevention, preparedness, response and recovery on ForestrySA land. The main objectives of the Policy for Fire Management are to reduce the risk of damage from fire to life, property and community assets and to meet fire-related legislated responsibilities. ForestrySA is a member of the Government Agency Fire Liaison Committee (GAFLC). All bushfire mitigation works are carried out in line with ForestrySA and GAFLC (2008) guidelines.

Prescribed burning of native vegetation is classed as a form of clearance under the *Native Vegetation Act 1991* and is prohibited without approval of the Native Vegetation Council. ForestrySA received delegated authority from the Native Vegetation Council in 2008 to undertake prescribed burning. In October 2009 amendments to the Native Vegetation Regulations 2003 altered the classification of land under the care and control of the Minister for Forests to allow for the clearance of native vegetation for the purpose of reducing combustible material providing such works are undertaken in accordance with a Standard Operating Procedure approved by the Native Vegetation Council.

Prescribed burning was undertaken periodically during the 1980's in Wirrabara Range but exact locations and frequencies are unknown. ForestrySA uses prescribed burning for habitat management and to reduce the amount of flammable material to assist in fire prevention for both natural and other assets. ForestrySA is a member of the Southern Flinders Ranges Fire Cooperative (SFRFC), a group that consists of representation from ForestrySA, Department for Environment and Natural Resources, SA Water and SA Country Fire Service. The group facilitates the development and implementation of joint agency prescribed burn programs and bushfire response arrangements. To date this has resulted in a prescribed burn in Wirrabara Range in Autumn 2010 along Go Kart Track and Weckerts Track as an extension to a burn undertaken by DENR in adjacent Telowie Gorge. An additional area to the south of Weckerts Track in WR8 is planned for burning in 2010/11. Future burn schedules will be developed in line with ForestrySA policies and as determined by regional priorities set by the SFRFC.

Current Uses

Conservation

The primary use of the areas is for the conservation and protection of native plant and animal communities. ForestrySA encourages volunteers and community groups to become involved in activities that meet the aims and objectives of improving the reserves conservation and community use values, such as flora and fauna surveys and weed control.

Community Use

Community use, public access and visitor management of the Wirrabara Forest Reserve includes provision and maintenance of facilities including camping grounds, picnic grounds and trails. An estimated 15,000 people visit the Northern Forests annually, which includes Bundaleer Forest Reserve. They engage in a variety of pursuits including bird watching, hiking, cycling, horse riding and in organised events like orienteering and motor sports. Horses, motor bikes and dogs are restricted from the NFNFR's and camping is also not permitted. Cycling is only allowed on existing formed fire tracks. The Heysen Trail and the Mawson Trail pass through Wirrabara Forest Reserve. Demands for community use in the NFNFR's are administered so that they are consistent with the management objectives for the land, are environmentally sustainable and compatible with other uses.

Community use, recreational and cultural values are further discussed in the Northern Forests Forest Management Plan.

Management Program

The management actions proposed will be carried out in accordance with relevant legislation and procedures contained within ForestrySA's Forest Management System, Plantation Manual and the Northern Forests Forest Management Plan.

In determining priority of management actions to combat threats to the reserves' natural resources, it is considered that:

- 1 = High priority; core business activity, where the threat has a high capacity to degrade the resource
- 2 = Medium priority
- 3 = Low priority; occasional interest activity, where the threat has a low capacity to degrade the resource.

GOALS	PERFORMANCE INDICATOR(S)	PRIORITY FOR ACTION	TIMING
Manage the reserves for the conservation of biodiversity.	No loss of species identified within the survey results.	1	10yr review Ongoing
	Diverse structure of vegetation communities and fauna populations within the reserves	1	
Undertake surveys of the reserve to build on knowledge base.	Periodic surveys undertaken to identify and monitor species diversity.	2	Ongoing
Maintain records of locations of significant flora or fauna	Record locations of significant flora and fauna on ForestrySA GIS	2	Start 2009-ongoing
Identify, protect and enhance areas of conservation and cultural heritage interest	Action plans to be developed and implemented for specific conservation and heritage objectives	3	Ongoing
Maintain link with DENR corporate databases.	Survey data is available to ForestrySA and other agencies/groups/individuals.	1	Ongoing
Provide visitors with appropriate information regarding the reserve's biological value.	Educational material available Wirrabara Forest Office	2	Ongoing
	Signs erected at appropriate locations.		
Implement management actions to ensure that <i>Phytophthora</i> and other plant pathogens and new weeds are not introduced within the reserve.	<i>Phytophthora</i> is not introduced into Wirrabara Forest Reserve. No new pathogens or weed species introduced.	1	Ongoing
Develop ecologically-based fire regimes to maximise biodiversity.	Vital attributes for plant (and animal) species within the reserve are completed.	1	Start 2010-ongoing
	Key fire response species for the reserve are identified.		
Minimise the impact of wildfire using a range of fire protection measures available to ForestrySA.	Annual wildfire prevention programs are completed.	1	Ongoing
	Fire-breaks are maintained.		
	Public access and use is regulated in periods of high fire danger.		
Identify activities with the potential for deleterious impacts and facilitate monitoring programs, including activities resulting from forest operations in adjacent forest reserves.	Impacts of permitted activities are monitored and reported by recreation user(s) or ForestrySA.	1	Ongoing
Minimise the impact of introduced plants and/or animals on the conservation values of the reserves.	A reduction in the distribution and number of introduced plant and animal species in the reserve. Annual weed control program in place as per ForestrySA's Weed Strategy	2	Ongoing
	Continue implementation of wild pine control programs within the reserves	1	Ongoing

Management Program cont.

GOALS	PERFORMANCE INDICATOR(S)	PRIORITY FOR ACTION	TIMING
Re-locate internal access tracks (where required) to facilitate fire protection works.	Number and position of access tracks relative to previous years.	2	If required
Maintain vehicle access tracks in a condition suitable for fire appliances in line with GAFLC standards.	Access to facilitate fire protection is available.	2	Ongoing
Erect compartment signs to assist navigation within the reserve.	Signs erected at compartment intersection(s).	3	Start 2010
Continue to maintain external fences.	Boundary fences are in a serviceable condition.	2	Ongoing
Maintain links with natural resource and environmental agencies, and community groups – their programs, activities and/or projects.	Established and/or maintained links with other agencies and groups.	2	Ongoing
Maintain communication with adjacent landholders and pursue opportunities for co-operative management.	Number of complaints received regarding management.	As required	Ongoing
Encourage involvement by volunteers and community groups in the control of pest plants and animals, and rehabilitation and monitoring of sites within the reserve.	Participation of volunteers and community groups.	1	Ongoing

Appendix 1

Flora Species Lists

Flora List - Wirrabara Range (Wir), Spaniards Gully (SG) and King Tree (KT)

SPECIES	COMMON NAME	STATUS						
		WIR	SG	KT	AUS	SA	NL	
<i>Acacia acinacea</i>	Wreath wattle	•					U	
* <i>Acacia baileyana</i>	Cootamundra wattle	•						
<i>Acacia calamifolia</i>	Wallowa	•						
<i>Acacia continua</i>	Thorn wattle	•		•				
<i>Acacia gracilifolia</i>	Graceful wattle	•				R	R	
<i>Acacia hakeiodes</i>	Hakea wattle	•						
<i>Acacia iteaphylla</i>	Flinders Ranges wattle	•				R	R	
<i>Acacia ligulata</i>	Umbrella bush	•						
<i>Acacia montana</i>	Mountain wattle	•				R	R	
<i>Acacia notabilis</i>	Noble wattle	•						
<i>Acacia paradoxa</i>	Kangaroo thorn	•						
<i>Acacia pycnantha</i>	Golden wattle	•	•	•				
<i>Acacia rupicola</i>	Rock wattle	•	•	•			R	
* <i>Acacia salicina</i>	Willow wattle	•	•					
<i>Acacia spinescens</i>	Spiny wattle		•				V	
<i>Acacia wattiana</i>	Dog wattle	•	•	•				
<i>Acaena echinata</i>	Sheep's burr	•	•	•				
<i>Acaena ovina</i>	Downy sheep's burr	•						
<i>Acianthus caudatus</i>	Mayfly orchid		•					
<i>Acianthus pusillus</i>	Mosquito orchid	•						
<i>Actinobole uliginosum</i>	Flannel cudweed	•		•				
* <i>Aira caryophyllea</i>	Silvery hair-grass	•						
* <i>Aira cupaniana</i>	Small hair-grass	•	•	•				
* <i>Aira elegantissima</i>	Delicate hair-grass		•	•				
<i>Ajuga australis</i>	Austral bugle			•				
* <i>Ajuga iva</i>	Southern bugle			•				
<i>Allocasuarina muelleriana</i> ssp. <i>muelleriana</i>	Common oak-bush	•	•					
<i>Allocasuarina verticillata</i>	Drooping sheoak	•	•	•				
<i>Alyogyne huegelii</i>	Native hibiscus	•						
<i>Alyxia buxifolia</i>	Sea box	•						
<i>Amphibromus archeri</i>	Pointed swamp wallaby-grass	•				R		
<i>Amphipogon caricinus</i> var. <i>caricinus</i>	Grey beard grass	•		•			R	
<i>Amyema miquelii</i>	Box mistletoe	•		•				
<i>Amyema preisii</i>	Wire-leaf mistletoe	•						
<i>Amyema</i> sp.	Mistletoe		•					
* <i>Anagallis arvensis</i>	Pimpernel	•	•	•				
* <i>Anagallis minima</i>	Chaffweed	•	•	•				
<i>Aphanes australiana</i>	Australian piert	•					R	

* Introduced species

Appendix 1

Flora Species Lists cont.

Flora List - Wirrabara Range (Wir), Spaniards Gully (SG) and King Tree (KT) cont.

SPECIES	COMMON NAME	STATUS						
		WIR	SG	KT	AUS	SA	NL	
<i>Aphelia gracilis</i>	Slender aphelia	•						Q
<i>Aphelia pumilio</i>	Dwarf aphelia	•						R
<i>Arachnorchis leptochila</i> ssp. <i>dentata</i>	Narrow-lip spider-orchid	•	•					V
<i>Arachnorchis saxatilis</i>	Rock spider-orchid	•	•					
<i>Arachnorchis tensa</i>	Inland green-comb spider-orchid	•	•	•				
* <i>Arctotheca calendula</i>	Cape weed	•						
<i>Aristida behriana</i>	Brush wire-grass	•		•				
<i>Arthropodium fimbriatum</i>	Nodding vanilla-lily	•		•				
<i>Arthropodium strictum</i>	Common vanilla-lily	•	•	•				
* <i>Asparagus asparagoides</i>	Bridal creeper	•						
<i>Asperula conferta</i>	Common woodruff	•		•				
* <i>Asphodelus fistulosus</i>	Onion weed	•						
<i>Asplenium flabellifolium</i>	Necklace fern	•						R
<i>Astroloma conostephioides</i>	Flame heath	•						
<i>Astroloma humifusum</i>	Cranberry heath	•	•	•				
<i>Atriplex semibaccata</i>	Berry saltbush	•						
<i>Austrodanthonia auriculata</i>	Lobed wallaby-grass	•		•				
<i>Austrodanthonia caespitosa</i>	Common wallaby-grass	•	•	•				
<i>Austrodanthonia eriantha</i>	Hill wallaby-grass	•						
<i>Austrodanthonia fulva</i>	Leafy wallaby-grass	•						K
<i>Austrodanthonia racemosa</i> var. <i>racemosa</i>	Slender wallaby-grass	•	•	•				U
<i>Austrodanthonia setacea</i>	Small-flower wallaby-grass	•	•	•				
<i>Austrodanthonia</i> sp.	Wallaby grass		•					
<i>Austrostipa blackii</i>	Crested spear-grass	•	•	•				
<i>Austrostipa breviglumis</i>	Cane spear-grass	•				R		R
<i>Austrostipa curticoma</i>	Short-crest spear-grass			•				Q
<i>Austrostipa elegantissima</i>	Feather spear-grass	•	•	•				
<i>Austrostipa eremophila</i>	Rusty spear-grass	•						
<i>Austrostipa hemipogon</i>	Half-beard spear grass	•						
<i>Austrostipa mollis</i>	Soft spear-grass	•						R
<i>Austrostipa nitida</i>	Balcarra spear-grass	•		•				
<i>Austrostipa nodosa</i>	Tall spear-grass	•	•	•				
<i>Austrostipa pilosa</i>	Velvet wallaby-grass		•	•				
<i>Austrostipa scabra</i>	Rough spear grass			•				
<i>Austrostipa scabra</i> ssp. <i>falcata</i>	Slender spear-grass			•				
<i>Austrostipa setacea</i>	Corkscrew spear-grass	•	•	•				R
<i>Austrostipa trichophylla</i>	Spear grass	•						T
* <i>Avena barbata</i>	Bearded oat	•	•	•				

* Introduced species

Appendix 1

Flora Species Lists cont.

Flora List - Wirrabara Range (Wir), Spaniards Gully (SG) and King Tree (KT) cont.

	SPECIES	COMMON NAME	STATUS					
			WIR	SG	KT	AUS	SA	NL
*	<i>Avena fatua</i>	Wild oat	•		•			
	<i>Baumea juncea</i>	Bare twig-rush	•					
	<i>Banksia marginata</i>	Silver banksia	•					R
	<i>Beyeria lechenaultii</i>	Turpentine bush	•					
	<i>Billardiera versicolor</i>	Yellow-flower apple-berry	•					R
	<i>Blennospora drummondii</i>	Dwarf button-flower	•					
	<i>Boerhavia dominii</i>	Tar vine	•					
	<i>Bossiaea prostrata</i>	Creeping bossiaea	•	•				
*	<i>Brachypodium distachyon</i>	False brome	•	•				
	<i>Brachyscome</i> sp.	Daisy	•					
	<i>Brachysome perpusilla</i>	Tiny daisy	•					
*	<i>Briza maxima</i>	Large quaking-grass	•	•	•			
*	<i>Briza minor</i>	Lesser quaking-grass	•	•	•			
*	<i>Bromus diandrus</i>	Great brome	•		•			
*	<i>Bromus madritensis</i>	Compact brome	•					
*	<i>Bromus rubens</i>	Red brome	•					
*	<i>Buglossoides arvensis</i>	Sheepweed			•			
	<i>Bulbine bulbosa</i>	Bulbine lily	•	•	•			
	<i>Bulbine semibarbata</i>	Small leek-lily	•					
	<i>Bunochilus viriosus</i>	Tall-banded-green-hood	•					
	<i>Burchardia umbellata</i>	Milkmaids		•				
	<i>Bursaria spinosa</i>	Sweet bursaria	•	•	•			
	<i>Caesia calliantha</i>	Blue grass-lily	•	•				
	<i>Caladenia latifolia</i>	Pink caladenia	•					E
	<i>Calandrinia corrigioloides</i>	Strap purslane	•					
	<i>Calandrinia eremaea</i>	Dryland purslane	•					
	<i>Calandrinia</i> sp.	Purslane	•					
	<i>Callistemon rugulosus</i>	Scarlet bottlebrush	•	•				
	<i>Callistemon teretifolius</i>	Needle bottlebrush	•					U
*	<i>Callitriche stagnalis</i>	Common water starwort	•					
	<i>Callitriche umbonata</i>	Brookweed	•				V	
	<i>Callitris glaucophylla</i>	White cypress pine	•		•			
	<i>Callitris gracilis</i>	Southern cypress pine	•	•	•			
	<i>Calocephalus citreus</i>	Lemon beauty-heads	•	•	•			U
	<i>Calostemma purpureum</i>	Pink garland-lily	•	•	•			
	<i>Calotis hispidula</i>	Hairy burr-daisy	•					
	<i>Calotis lappulacea</i>	Burr-daisy	•				R	Q
	<i>Calytrix tetragona</i>	Common fringe-myrtle	•	•				
*	<i>Carduus tenuiflorus</i>	Slender thistle			•			

* Introduced species

Appendix 1

Flora Species Lists cont.

Flora List - Wirrabara Range (Wir), Spaniards Gully (SG) and King Tree (KT) cont.

SPECIES	COMMON NAME	STATUS						
		WIR	SG	KT	AUS	SA	NL	
<i>Carex appressa</i>	Tall sedge	•		•				
<i>Carex breviculmis</i>	Short-stem sedge	•		•			R	
<i>Carex fascicularis</i>	Tassel sedge	•					K	
<i>Carex gaudichaudiana</i>	Fern sedge			•				
<i>Carex inversa</i> var. <i>major</i>	Knob sedge	•		•			R	
<i>Carex tereticaulis</i>	Rush sedge	•					R	
<i>Cassinia arcuata</i>	Drooping cassinia	•		•			U	
<i>Cassinia complanata</i>	Sticky cassinia	•	•					
<i>Cassinia laevis</i>	Curry bush	•	•	•				
<i>Cassytha glabella</i> f. <i>dispar</i>	Slender dodder-laurel	•					R	
<i>Cassytha melantha</i>	Coarse dodder-laurel	•						
<i>Cassytha peninsularis</i> var. <i>flindersii</i>	Flinders Ranges dodder-laurel	•	•				R	
* <i>Centaurium spicatum</i>	Spike centaury	•		•				
<i>Centipeda cunninghamii</i>	Common sneezeweed	•	•				K	
<i>Centrolepis aristata</i>	Pointed centrolepis	•						
<i>Centrolepis polygyna</i>	Wiry centrolepis	•					R	
<i>Centrolepis strigosa</i> ssp. <i>strigosa</i>	Hairy centrolepis	•	•					
* <i>Cerastium glomeratm</i>	Mouse-ear chickweed	•		•				
* <i>Cerastium semidecandrum</i>	Small chickweed	•		•				
<i>Chamaescilla corymbosa</i> var. <i>corymbosa</i>	Blue squill	•	•				R	
<i>Chamaesyce drummondii</i>	Caustic weed	•		•				
<i>Cheilanthes austrotenuifolia</i>	Annual rock-fern	•	•					
<i>Cheilanthes distans</i>	Bristly cloak-fern	•					R	
<i>Cheilanthes sieberi</i> ssp. <i>sieberi</i>	Narrow rock-fern	•	•	•				
<i>Cheiranthra alternifolia</i>	Hand-flower	•					T	
* <i>Chenopodium album</i>	Goosefoot	•						
<i>Chenopodium desertorum</i>	Desert goosefoot		•	•				
<i>Chenopodium</i> sp.	Goosefoot	•						
<i>Chloris</i> sp.	Windmill grass	•						
<i>Choretrum glomeratum</i>	Sourbush		•	•				
<i>Chrysocephalum apiculatum</i>	Common everlasting	•	•	•				
<i>Chrysocephalum semipapposum</i>	Clustered everlasting	•	•				Q	
<i>Chrysocephalum</i> sp.	Everlasting	•						
* <i>Cirsium</i> sp.	Thistle	•						
* <i>Cirsium vulgare</i>	Spear thistle			•				
<i>Clematis microphylla</i>	Old man's beard	•						
<i>Comesperma volubile</i>	Love creeper	•						
<i>Convolvulus angustissimus</i> ssp. <i>angustissimus</i>	Australian bindweed	•	•	•				

* Introduced species

Appendix 1

Flora Species Lists cont.

Flora List - Wirrabara Range (Wir), Spaniards Gully (SG) and King Tree (KT) cont.

SPECIES	COMMON NAME	STATUS						
		WIR	SG	KT	AUS	SA	NL	
<i>Convolvulus angustissimus</i> ssp. <i>peninsularum</i>	Grassland bindweed	•	•	•			U	
<i>Convolvulus remotus</i>	Grassy bindweed	•		•				
<i>Convolvulus</i> sp.	Bindweed		•	•				
* <i>Conyza albida</i>	Tall fleabane	•		•				
* <i>Conyza</i> sp.	Fleabane	•						
<i>Correa glabra</i> var. <i>turnbulli</i>	Rock correa	•					R	
<i>Corunastylis tepperi</i>	Pygmy orchid	•					Q	
<i>Corysanthes diemenicus</i>	Veined helmet-orchid	•						
<i>Corysanthes incurvus</i>	Slaty helmet-orchid	•					R	
<i>Cotula australis</i>	Common cotula	•	•					
* <i>Cotula coronopifolia</i>	Water buttons	•						
<i>Craspedia haplorrhiza</i>	Billy-buttons		•				R	
<i>Craspedia variabilis</i>	Billy-buttons	•	•	•				
<i>Crassula closiana</i>	Staked crassula	•						
<i>Crassula colligata</i>	Crassula	•	•	•				
<i>Crassula colorata</i> ssp. <i>colorata</i>	Dense crassula	•	•	•				
<i>Crassula decumbens</i> var. <i>decumbens</i>	Spreading crassula	•	•	•				
* <i>Crassula natans</i>	Weedy crassula	•		•				
<i>Crassula peduncularis</i>	Purple crassula	•				R		
<i>Crassula sieberiana</i>	Sieber's crassula		•					
<i>Crassula</i> sp.	Crassula			•				
* <i>Crepis foetida</i> ssp. <i>foetida</i>	Stinking hawksbeard	•						
<i>Cryptandra</i> sp.	Simple haired calyx type	•						
<i>Cryptandra</i> sp. <i>floriferous</i>	Pretty cryptandra	•						
<i>Cymbonotus preissianus</i>	Austral bear's ear	•		•			R	
<i>Cymbopogon ambiguus</i>	Lemon grass	•		•				
* <i>Cynodon dactylon</i>	Couch	•						
<i>Cynoglossum suaveolens</i>	Sweet hound's tongue	•	•	•			R	
<i>Cynosurus cristatus</i>	Crested dog's tail grass	•						
* <i>Cynosurus echinatus</i>	Rough dog's-tail grass	•		•				
<i>Cyperus gymnocaulos</i>	Spiny flat-sedge	•						
<i>Cyperus tenellus</i>	Tiny flat sedge	•					R	
<i>Cyperus vaginatus</i>	Stiff flat-sedge	•						
<i>Cyrtostylis reniformis</i>	Small gnat-orchid	•						
<i>Dampiera dysantha</i>	Shrubby dampiera	•						
<i>Dampiera lanceolata</i> var.	Grooved dampiera	•						
<i>Dampiera rosmarinifolia</i>	Rosemary dampiera	•						
<i>Daucus glochidiatus</i>	Native carrot	•		•				

* Introduced species

Appendix 1

Flora Species Lists cont.

Flora List - Wirrabara Range (Wir), Spaniards Gully (SG) and King Tree (KT) cont.

SPECIES	COMMON NAME	STATUS						
		WIR	SG	KT	AUS	SA	NL	
<i>Daviesia genistifolia</i>	Broom bitter-pea	•						U
<i>Dianella brevicaulis/revoluta</i> var.	Black-anther flax-lily			•				
<i>Dianella revoluta</i> var. <i>divaricata</i>	Broad-leaf flax-lily	•						
<i>Dianella revoluta</i> var. <i>revoluta</i>	Black-anther flax-lily	•	•	•				
<i>Dichelachne crinita</i>	Long-hair plume-grass	•	•					R
<i>Dichondra repens</i>	Kidney weed	•						
* <i>Digitaria sanguinalis</i>	Crab grass	•						
<i>Diplodium robustum</i>	Large shell-orchid	•						
* <i>Dittrichia graveolens</i>	Stinkweed	•						
<i>Diuris behrii</i>	Behr's cowslip orchid	•				V		V
<i>Diuris palustris</i>	Little donkey-orchid	•						R
<i>Dodonaea viscosa</i> ssp. <i>spatulata</i>	Sticky hop-bush	•	•					
<i>Drosera auriculata</i>	Tall sundew	•	•	•				U
<i>Drosera glanduligera</i>	Scarlet sundew			•				R
<i>Drosera macrantha</i> ssp. <i>planchonii</i>	Climbing sundew	•	•	•				
<i>Drosera peltata</i>	Pale sundew	•	•	•				U
* <i>Echium plantagineum</i>	Salvation Jane	•						
* <i>Ehrharta calycina</i>	Perennial veldt grass	•						
* <i>Ehrharta longifolia</i>	Annual veldt grass			•				
<i>Einadia nutans</i> ssp. <i>nutans</i>	Climbing saltbush	•						
<i>Eleocharis acuta</i>	Common spike-rush			•				
<i>Elocharis</i> sp.	Spike-rush	•						
<i>Elymus multiflorus</i>	Native wheat-grass	•						
<i>Elymus scaber</i> var. <i>scaber</i>	Native wheat-grass	•	•	•				
<i>Enneapogon nigricans</i>	Black-head grass	•		•				
<i>Epilobium billardierianum</i> ssp. <i>billardierianum</i>	Robust willow-herb	•						R
<i>Epilobium billardierianum</i> ssp. <i>cinereum</i>	Variable willow-herb	•						
<i>Epilobium hirtigerum</i>	Hairy willow-herb	•						K
<i>Epilobium</i> sp.	Willow-herb	•						K
<i>Eriochilus cucullatus</i>	Parson's band	•						R
* <i>Erodium botrys</i>	Long heron's-bill	•						
* <i>Erodium cicutarium</i>	Cut-leaf heron's-bill	•						
* <i>Erodium</i> sp.	Heron's-bill	•		•				
<i>Eucalyptus camaldulensis</i> var. <i>camaldulensis</i>	River red gum	•	•	•				
<i>Eucalyptus cladocalyx</i>	Sugar gum	•	•	•				
<i>Eucalyptus goniocalyx</i>	Long-leaf box	•						
<i>Eucalyptus leucoxylo</i>	South Australian blue gum	•						

* Introduced species

Appendix 1

Flora Species Lists cont.

Flora List - Wirrabara Range (Wir), Spaniards Gully (SG) and King Tree (KT) cont.

SPECIES	COMMON NAME	STATUS						
		WIR	SG	KT	AUS	SA	NL	
<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	South Australian blue gum	•	•	•				
<i>Eucalyptus leucoxylon</i> ssp. <i>pruinosa</i>	Inland South Australian blue gum		•	•				
<i>Eucalyptus microcarpa</i>	Grey box	•	•	•			R	
<i>Eucalyptus odorata</i>	Peppermint box		•	•				
<i>Eucalyptus socialis</i>	Beaked red mallee		•					
<i>Euchiton involucreatus</i>	Star cudweed	•						
<i>Euchiton sphaericus</i>	Annual cudweed	•						
<i>Eutaxia diffusa</i>	Large-leaf eutaxia		•				E	
<i>Eutaxia microphylla</i>	Common eutaxia	•	•	•				
<i>Eutaxia</i> sp.	Eutaxia							
<i>Exocarpos aphyllus</i>	Leafless cherry	•						
<i>Exocarpos cupressiformis</i>	Native cherry	•	•	•			U	
* <i>Fraxinus rotundifolia</i> ssp. <i>rotundifolia</i>	Desert ash			•				
<i>Galium gaudichaudii</i>	Rough bedstraw	•						
<i>Galium migrans</i>	Loose bedstraw	•						
* <i>Galium murale</i>	Small bedstraw	•	•					
<i>Galium</i> sp.	Bedstraw			•				
* <i>Gastridium phleoides</i>	Nit-grass	•						
* <i>Gazania</i> sp.	Treasure flowers			•				
* <i>Geranium dissectum</i>	Cut-leaf geranium	•						
<i>Geranium potentilloides</i> var. <i>potentilloides</i>	Downy geranium	•	•	•				
<i>Geranium retrorsum</i>	Grassland geranium	•						
<i>Geranium solanderi</i> var. <i>solanderi</i>	Austral geranium	•	•	•				
<i>Geranium</i> sp.	Geranium		•					
<i>Glischrocaryon behrii</i>	Golden pennants	•					K	
<i>Glycine rubiginosa</i>	Twining glycine	•		•				
<i>Glycine tabacina</i>	Variable glycine			•		V	T	
* <i>Glycyrrhiza glabra</i>	Wild liquorice	•						
<i>Gonocarpus elatus</i>	Hill raspwort	•	•	•				
<i>Gonocarpus megianus</i>	Broad-leaf raspwort	•						
<i>Gonocarpus tetragynus</i>	Small-leaf raspwort	•	•	•				
<i>Goodenia albiflora</i>	White goodenia	•					U	
<i>Goodenia blackiana</i>	Native primose		•					
<i>Goodenia calcarata</i>	Streaked goodenia	•					K	
<i>Goodenia ovata</i>	Hop goodenia	•						
<i>Goodenia pinnatifida</i>	Cut-leaf goodenia	•	•	•			U	

* Introduced species

Appendix 1

Flora Species Lists cont.

Flora List - Wirrabara Range (Wir), Spaniards Gully (SG) and King Tree (KT) cont.

SPECIES	COMMON NAME	STATUS						
		WIR	SG	KT	AUS	SA	NL	
<i>Goodenia pusilliflora</i>	Small flower goodenia	•		•				
<i>Goodenia robusta</i>	Woolly goodenia	•	•	•				
<i>Goodenia varia</i>	Sticky goodenia	•						
<i>Grevillea lavandulacea</i> ssp. <i>lavandulacea</i>	Spider flower	•	•					
* <i>Gypsophila tubulosa</i>	Annual chalkwort	•						
<i>Haeckeria punctulata</i>	Sticky haecheria	•				R	R	
<i>Hakea carinata</i>	Erect hakea	•	•				U	
<i>Hakea rostrata</i>	Beaked hakea	•						
<i>Hakea rugosa</i>	Dwarf hakea	•					V	
<i>Hakea</i> sp.	Hakea	•						
<i>Halgania</i> sp.	Blue-flower	•						
<i>Halogaris</i> sp.	Raspwort			•				
<i>Hardenbergia violacea</i>	Native lilac	•		•			U	
* <i>Hedypnois rhagadioloides</i>	Cretan weed	•		•				
<i>Helichrysum leucopsidium</i>	Satin everlasting	•	•					
<i>Heliotropium</i> sp.	Heliotrope	•						
<i>Hibbertia crinata</i>	Hibbertia	•	•					
<i>Hibbertia exutiacies</i>	Prickly guinea-flower	•	•	•				
<i>Hibbertia riparia</i>	Bristly guinea-flower	•						
<i>Hibiscus trionum</i>	Bladder ketmia	•						
* <i>Hordeum</i> sp.	Barley	•		•				
<i>Hyalosperma demissa</i>	Dwarf sunray	•	•	•				
<i>Hyalosperma</i> sp.	Sunray	•						
<i>Hybanthus floribundus</i> ssp. <i>floribundus</i>	Shrub violet	•						
<i>Hybanthus monopetalus</i>	Slender violet	•					U	
<i>Hydrocotyle callicarpa</i>	Tiny pennywort	•	•					
<i>Hydrocotyle foveolata</i>	Yellow pennywort	•						
<i>Hydrocotyle laxiflora</i>	Stinking pennywort	•	•	•				
<i>Hydrocotyle</i> sp.	Pennywort	•						
<i>Hymenochilus nemoralis</i>	Swan-head greenhood	•		•				
<i>Hypericum gramineum</i>	St. John's wort	•					T	
<i>Hypericum japonicum</i>	Matted St. John's wort	•						
* <i>Hypericum perforatum</i>	St. John's wort			•				
* <i>Hypochaeris glabra</i>	Smooth cat's ear	•	•	•				
* <i>Hypochaeris radicata</i>	Rough cat's ear	•		•				
<i>Hypoxis glabella</i> var. <i>glabella</i>	Tiny star	•		•				
<i>Indigofera australis</i> var. <i>australis</i>	Austral indigo	•	•					

* Introduced species

Appendix 1

Flora Species Lists cont.

Flora List - Wirrabara Range (Wir), Spaniards Gully (SG) and King Tree (KT) cont.

SPECIES	COMMON NAME	WIR	SG	KT	STATUS		
					AUS	SA	NL
<i>Isoetes drummondii</i> ssp. <i>drummondii</i>	Plain quillwort	•				R	
<i>Iseotopsis graminifolia</i>	Grass cushion	•					
<i>Isolepis australiensis</i>	Southern club-rush	•		•			
<i>Isolepis cernua</i>	Nodding club-rush	•					R
<i>Isolepis hookeriana</i>	Grassy club-rush	•		•			K
* <i>Isolepis hystrix</i>	Sedge	•					
<i>Isolepis marginata</i>	Little club-rush	•		•			K
<i>Isolepis platycarpa</i>	Flat-fruit club-rush	•					R
<i>Ixodia achillaeoides</i> ssp. <i>alata</i>	Hills daisy	•					U
<i>Jonesiopsis flaccida</i>	Daddy-long-legs spider orchid	•					
<i>Juncus aridicola</i>	Inland rush	•					
* <i>Juncus articulatus</i>	Jointed rush	•					
<i>Juncus bufonius</i>	Toad rush	•		•			
<i>Juncus caespiticus</i>	Grassy rush	•					V
* <i>Juncus capitatus</i>	Dwarf rush	•					
<i>Juncus flavidus</i>	Yellow rush	•		•			V
<i>Juncus holoschoenus</i>	Joint-leaf rush	•	•				R
<i>Juncus radula</i>	Hoary rush	•				V	V
<i>Juncus subsecundus</i>	Finger rush	•		•			
<i>Kennedia prostrata</i>	Scarlet runner	•	•	•			
* <i>Kickxia</i> sp.	Toadflax	•					
<i>Lachnagrostis aemula</i>	Blown grass	•	•				
<i>Lachnagrostis filiformis</i>	Common blown-grass	•		•			
<i>Lagenophora huegelii</i>	Coarse bottle-daisy	•	•	•			
* <i>Lamarckia aurea</i>	Toothbrush grass	•					
<i>Lasiopetalum</i> sp.	Velvet bush	•					
<i>Lepidium</i> sp.	Peppergrass	•					
<i>Lepidosperma congestum</i>	Clustered sword-sedge			•			
<i>Lepidosperma curtisiae</i>	Little sword-sedge	•					R
<i>Lepidosperma</i> sp.	Sword sedge	•					
<i>Lepidosperma viscidum</i>	Sticky sword sedge	•	•				
<i>Leptoceras menziesii</i>	Hare orchid	•					E
<i>Leptorhynchos squamatus</i> ssp. <i>squamatus</i>	Scaly buttons	•		•			
<i>Levenhookia dubia</i>	Hairy stylewort	•		•			R
<i>Limosella curdieana</i> var. <i>curdieana</i>	Large mudwort			•			
<i>Linguella nana</i>	Dwarf greenhood	•					
<i>Linum marginale</i>	Native flax	•	•	•			U
* <i>Linum strictum</i>	Upright flax			•			

* Introduced species

Appendix 1

Flora Species Lists cont.

Flora List - Wirrabara Range (Wir), Spaniards Gully (SG) and King Tree (KT) cont.

SPECIES	COMMON NAME	STATUS						
		WIR	SG	KT	AUS	SA	NL	
* <i>Linum trigynum</i>	Yellow flax	•						
<i>Lissanthe strigosa ssp. subulata</i>	Peach heath	•					R	
<i>Lobelia anceps</i>	Angled lobelia	•					R	
<i>Lobelia gibbosa</i>	Tall lobelia	•						
<i>Logania saxitilis</i>	Rock logania	•				R	R	
* <i>Logfia gallica</i>	Slender cudweed			•				
* <i>Lolium rigidum</i>	Wimmera ryegrass	•	•	•				
<i>Lomandra densiflora</i>	Soft tussock mat-rush	•	•	•				
<i>Lomandra multiflora ssp. dura</i>	Hard mat-rush	•	•	•				
<i>Lotus australis</i>	Austral trefoil	•						
<i>Luzula meridionalis</i>	Common wood-rush	•		•				
<i>Lysiana exocarpi ssp. exocarpi</i>	Harelequin mistletoe	•						
<i>Lythrum hyssopifolia</i>	Lesser loosestrife	•		•				
<i>Maireana sp.</i>	Bluebush	•						
* <i>Malva sp.</i>	Mallow	•						
* <i>Marubium vulgare</i>	Horehound	•	•	•				
* <i>Meidicago sp.</i>	Medics	•		•				
* <i>Melaleuca sp.</i>	Weed melaleuca	•						
* <i>Melilotus sp.</i>	Tall medic	•						
<i>Mentha satureioides</i>	Native pennyroyal	•		•		R	V	
<i>Microlaena stipoides var. stipoides</i>	Weeping rice-grass	•					R	
<i>Microseris lanceolata</i>	Yam daisy	•	•	•				
<i>Microtis arenaria</i>	Notched onion-orchid	•	•	•				
<i>Microtis arenaria x M. sp short leaf</i>	Onion-orchid hybrid	•						
<i>Microtis frutetorum</i>	Onion orchid	•		•				
<i>Microtis parviflora</i>	Slender onion-orchid	•					R	
<i>Microtis sp.</i>	Onion-orchid	•						
<i>Microtis sp. aff.parviflora</i>	Onion-orchid	•					K	
<i>Microtis unifolia</i>	Common onion-orchid	•						
<i>Microtis unifolia complex</i>	Onion-orchid	•						
<i>Mictotis sp. 'Short-leaf'</i>	Onion orchid	•						
<i>Millotia major</i>	Bow-flower	•						
<i>Millotia myosotidifolia</i>	Broad-leaf millotia	•						
<i>Millotia perpusilla</i>	Bow flower	•					R	
<i>Millotia tenuifolia var. tenuifolia</i>	Soft millotia	•	•				R	
* <i>Misopates orontium</i>	Lesser snapdragon	•						
* <i>Moenchia erecta</i>	Erect chickweed			•				
* <i>Monopsis debilis var. depressa</i>	Monopsis	•						
* <i>Moraea setifloia</i>	Thread iris	•		•				

* Introduced species

Appendix 1

Flora Species Lists cont.

Flora List - Wirrabara Range (Wir), Spaniards Gully (SG) and King Tree (KT) cont.

SPECIES	COMMON NAME	STATUS						
		WIR	SG	KT	AUS	SA	NL	
* <i>Moraea</i> spp.	Cape tulip	•						
* <i>Morea flaccida</i>	One-leaf cape-tulip			•				
<i>Myoporum montanum</i>	Native myrtle			•				
<i>Myoporum</i> sp. 'petiolatum'	Boobiella	•					Q	
<i>Myosotis australis</i>	Austral forget-me-not	•					K	
* <i>Neatostema apula</i>				•				
<i>Neurachne alopecuroidea</i>	Fox-tail mulga-grass	•	•	•				
* <i>Olea europaea</i>	Olive	•		•				
<i>Olearia decurrens</i>	Winged daisy-bush	•						
<i>Olearia minor</i>	Heath daisy-bush	•						
<i>Olearia pannosa</i> ssp. <i>cardiophylla</i>	Velvet daisy-bush	•				R	R	
<i>Olearia pannosa</i> ssp. <i>pannosa</i>	Silver daisy-bush		•		V	V	V	
<i>Olearia pimeleoides</i> ssp. <i>pimeloides</i>	Pimelea daisy-bush			•				
<i>Olearia ramulosa</i>	Twiggy daisy-bush	•						
<i>Olearia</i> sp.	Daisy bush	•						
<i>Oligochaetochilus bisetus</i>	Two-bristle greenhood	•						
<i>Oligochaetochilus pusillus</i>	Small rusty-hood	•						
* <i>Onopordum acanthium</i> ssp. <i>acanthium</i>	Scoth thistle	•						
<i>Opercularia turpis</i>	Twiggy stinkweed	•						
<i>Ophioglossum lusitanicum</i>	Austral adder's-tongue	•					U	
<i>Oxalis perennans</i>	Native sorrel	•	•	•				
* <i>Oxalis pes-caprae</i>	Soursob	•		•				
<i>Ozothamnus retusus</i>	Notched bush-everlasting	•					U	
* <i>Panicum effusum</i> var. <i>effusum</i>	Hairy panic			•				
<i>Panicum</i> sp.	Native millet	•		•				
<i>Parietaria australis</i>	Smooth-nettle	•						
<i>Parietaria cardiostegia</i>	Mallee smooth-nettle	•						
* <i>Paspalum</i> sp.	Paspalum grass	•						
<i>Pelargonium</i> sp.	Stork's bill	•						
* <i>Pennisetum</i> spp.	Kikuyu/fountain grass	•						
* <i>Pentaschistis</i> sp.	Pussy tail	•		•				
* <i>Periballia minuta</i>	Small hair-grass			•				
<i>Persicaria decipiens</i>	Slender knotweed	•					T	
<i>Petalochilus coactilis</i>	Flinder's Ranges caladenia	•					U	
<i>Petalochilus carneus</i>	Pink fingers	•		•				
* <i>Petrorhagia</i> sp.		•						
* <i>Petrorhagia velutina</i>	Velvet pink			•				
<i>Pheladenia deformis</i>	Blue fairies	•	•					

* Introduced species

Appendix 1

Flora Species Lists cont.

Flora List - Wirrabara Range (Wir), Spaniards Gully (SG) and King Tree (KT) cont.

SPECIES	COMMON NAME	STATUS						
		WIR	SG	KT	AUS	SA	NL	
<i>Phragmites australis</i>	Common reed	•						
<i>Phyllangium divergens</i>	Wiry mitrewort	•						
<i>Phyllangium sulcatum</i>		•				V		
<i>Phyllanthus saxosus</i>	Rock spurge	•					R	
<i>Pimelea curviflora</i> var. <i>gracilis</i>	Curved riceflower	•		•				
<i>Pimelea flava</i> ssp. <i>dichotoma</i>	Diosma riceflower	•						
<i>Pimelea glauca</i>	Smooth riceflower	•	•	•				
<i>Pimelea micrantha</i>	Silky riceflower	•						
<i>Pimelea</i> sp.	Rice flower	•						
<i>Pimelea stricta</i>	Erect riceflower	•						
* <i>Pinus halepensis</i>	Aleppo pine	•	•	•				
* <i>Pinus radiata</i>	Radiata pine	•	•	•				
* <i>Piptatherium milliaceum</i>	Rice millet	•						
<i>Plantago drummondii</i>	Dark plantain	•						
<i>Plantago gaudichaudii</i>	Narrow-leaf plantain	•	•	•			U	
<i>Plantago hispida</i>	Hairy plantain	•	•					
* <i>Plantago lanceolata</i> var. <i>lanceolata</i>	Ribwort	•		•				
<i>Plantago</i> sp. <i>B</i>	Little plantain	•		•				
<i>Pleurosorus rutifolius</i>	Blanket fern	•					U	
<i>Pleurosorus subglandulosus</i>	Clubbed blanket fern	•						
<i>Plumatichilos plumosum</i>	Bearded greenhood	•	•				U	
* <i>Poa annua</i>	Winter grass	•						
* <i>Poa bulbosa</i>	Bulbous meadow grass	•		•				
<i>Poa crassicaudex</i>	Thick-stem tussock-grass	•	•	•				
* <i>Poa infirma</i>	Tussock-grass			•				
<i>Poa labillardieri</i> var. <i>labillardieri</i>	Common tussock-grass			•				
<i>Podolepis tepperi</i>	Delicate copper-wire daisy	•					R	
* <i>Polycarpon tetraphyllum</i>	Four-leaf allseed	•		•				
<i>Poranthera microphylla</i>	Small poranthera	•						
<i>Prasophyllum odoratum</i>	Scented leek-orchid	•					R	
<i>Prasophyllum</i> sp.	Leek orchid	•						
<i>Prassophyllum occidentale</i>	Plain's leek-orchid			•				
<i>Prostanthera behriana</i>	Downy mintbush	•					R	
<i>Prostanthera</i> sp.	Mintbush	•						
<i>Pterostylis curta</i>	Blunt greenhood	•				R	V	
<i>Pterostylis pedunculata</i>	Maroon-hood	•					T	
<i>Pterostylis</i> sp.	Greenhood		•					
<i>Ptilotus spathulatus</i>	Pussy tails	•						
<i>Pultenaea largiflorens</i>	Twiggy bush-pea	•	•	•			U	

* Introduced species

Appendix 1

Flora Species Lists cont.

Flora List - Wirrabara Range (Wir), Spaniards Gully (SG) and King Tree (KT) cont.

SPECIES	COMMON NAME	STATUS						
		WIR	SG	KT	AUS	SA	NL	
<i>Pultenea densiflora</i>	Dense bush-pea		•					E
<i>Ranunculus hamatosetosus</i>	Hill buttercup	•						
<i>Ranunculus lappaceus</i>	Native buttercup	•						K
<i>Ranunculus pachycarpus</i>	Thick-fruit buttercup	•		•				R
<i>Ranunculus pumilio</i> var. <i>pumilio</i>	Ferny buttercup	•		•				
<i>Ranunculus sessiliflorus</i> var. <i>sessiliflorus</i>	Annual buttercup	•						U
* <i>Raphanus raphanistrum</i>	Wild radish	•						
<i>Rhagodia parabolica</i>	Mealy saltbush	•						
<i>Rhodanthe laevis</i>	Smooth daisy	•						
<i>Rhodanthe pygmaea</i>	Pigmy daisy		•	•				
* <i>Romulea</i> sp.	Onion grass	•		•				
* <i>Rorippa nasturtium aquaticum</i>	Watercress	•						
* <i>Rosa canina</i>	Dog rose	•		•				
* <i>Rostraria pumila</i>	Tiny bristle-grass	•						
* <i>Rubus</i> sp.	Blackberry	•						
<i>Rumex brownii</i>	Slender dock	•						
* <i>Rumex</i> sp.	Dock	•						
* <i>Sagina apetala</i>	Annual pearlwort	•						
* <i>Salvia</i> sp.	Sage			•				
* <i>Salvia verbenaca</i> form	Wild sage	•						
* <i>Scabiosa atropurpurea</i>	Pincushion			•				
<i>Scaevola albida</i>	Fanflower	•		•				
<i>Scaevola humilis</i>	Inland fanflower			•				
* <i>Schismus barbatus</i>	Arabian grass	•						
<i>Schoenoplectus</i> sp.	Club rush	•						
<i>Schoenus apogon</i>	Common bog-rush	•	•	•				
<i>Sebaea ovata</i>	Yellow sebaea	•						
<i>Senecio dolichocephalus</i>	Woodland groundsel			•				Q
<i>Senecio glomeratus</i>	Creek groundsel	•						
<i>Senecio laceratus</i>	Cut-leaf groundsel	•						K
<i>Senecio odoratus</i>	Scented groundsel	•						U
<i>Senecio phellus</i>	Woodland groundsel	•		•				
<i>Senecio picridioides</i>	Purple-leaf groundsel	•						K
<i>Senecio pinnatifolius</i>	Variable groundsel		•					
<i>Senecio quadridentatus</i>	Cotton groundsel	•	•	•				
<i>Senecio tenuiflorus</i>	Woodland groundsel	•						
<i>Senna</i> sp.	Senna	•						
<i>Setaria</i> sp.	Pigeon/summer grass	•						
* <i>Sherardia arvensis</i>	Field madder			•				

* Introduced species

Appendix 1

Flora Species Lists cont.

Flora List - Wirrabara Range (Wir), Spaniards Gully (SG) and King Tree (KT) cont.

SPECIES	COMMON NAME	STATUS						
		WIR	SG	KT	AUS	SA	NL	
<i>Sigesbeckia australiensis</i>	Australian siegesbeckia	•						
* <i>Silene apatala</i>	Catchfly	•						
* <i>Silene nocturna</i>	Mediterranean catchfly	•		•				
<i>Siloxerus multiflorus</i>	Small wrinklewort	•						
* <i>Silybum marianum</i>	Variegated thistle	•						
* <i>Solanum nigrum</i>	Black nightshade	•						
<i>Solenogyne dominii</i>	Smooth solenogyne		•	•			R	
* <i>Sonchus oleraceus</i>	Common sow-thistle	•	•	•				
* <i>Sonchus sp.</i>	Native sow-thistle	•		•				
<i>Spergularia diandra</i>	Dwarf spurrey		•					
<i>Spergularia sp.</i>	Sand spurrey	•						
<i>Sporobolus virginicus</i>	Salt couch			•				
<i>Spyridium parvifolium</i>	Dusty miller	•	•					
<i>Stackhousia aspericocca</i>	Bushy candles	•						
<i>Stackhousia monogyna</i>	Creamy candles	•	•	•				
<i>Stellaria angustifolia</i>	Swamp starwort	•						
* <i>Stellaria media</i>	Common chickweed	•		•				
<i>Stuartina muelleri</i>	Spoon cudweek	•						
<i>Stylidium inundatum</i>	Hundreds and thousands	•						
<i>Tempeltonia aculeata</i>	Spiny mallee-pea						R	
<i>Templetonia sp.</i>		•						
<i>Thelymitra albiflora</i>	White sun-orchid	•	•					
<i>Thelymitra batesii</i>	Sun-orchid	•	•	•				
<i>Thelymitra batesii</i> x <i>T. alcockiae</i>	Sun-orchid hybrid	•						
<i>Thelymitra brevifolia</i>	Short leaf sun-orchid	•	•					
<i>Thelymitra grandiflora</i>	Great sun-orchid	•					R	
<i>Thelymitra luteocilium</i>	Yellow-tuft sun-orchid	•		•				
<i>Thelymitra megalyptra</i>	Scented sun-orchid	•						
<i>Thelymitra nuda</i>	Scented sun-orchid			•				
<i>Thelymitra ssp. alcockiae</i>	Scented sun-orchid	•	•	•				
<i>Thelymitra pauciflora</i>	Slender sun-orchid	•						
<i>Thelymitra rubra</i>	Salmon sun-orchid	•	•				R	
<i>Thelymitra rubra</i> x <i>T. luteocilium</i>		•						
<i>Thelymitra ssp. 'glaucophylla'</i>		•						
<i>Thelymitra</i> x <i>chasmogama</i>	Globe hood sun-orchid	•						
<i>Themeda triandra</i>	Kangaroo grass	•	•	•				
<i>Thysanotus patersonii</i>	Twining fringe-lily	•	•	•				
<i>Thysanotus tenellus</i>	Grassy fringe-lily	•				R	R	
* <i>Tordylium apulum</i>	False carrot-weed			•				

* Introduced species

Appendix 1

Flora Species Lists cont.

Flora List - Wirrabara Range (Wir), Spaniards Gully (SG) and King Tree (KT) cont.

SPECIES	COMMON NAME	STATUS						
		WIR	SG	KT	AUS	SA	NL	
	<i>Tricoryne elatior</i>	Yellow rush-lily	•					R
*	<i>Trifolium angustifolium</i>	Narrow-leaf clover	•	•	•			
*	<i>Trifolium arvense</i> var. <i>arvense</i>	Hare's-foot clover			•			
*	<i>Trifolium campestre</i>	Hop clover	•	•	•			
*	<i>Trifolium cherleri</i>	Fluffy clover			•			
*	<i>Trifolium subterraneum</i>	Subterranean clover			•			
	<i>Triglochin nanum</i>	Dwarf arrowgrass	•	•				
	<i>Triglochin</i> sp.	Arrowgrass	•		•			
	<i>Triodia irritans</i>	Spinifex	•					
	<i>Triodia scariosa</i>	Spinifex		•	•			
	<i>Triptilodiscus pygmaeus</i>	Small yellow-heads	•		•			
	<i>Typha</i> sp.	Bullrush	•					
*	<i>Urospermum picroides</i>	False hawkbit	•	•				
	<i>Velleia paradoxa</i>	Spur velleia			•			
*	<i>Verbascum virgatum</i>	Twiggy mullein	•					
	<i>Veronica plebeia</i>	Trailing speedwell	•	•	•			U
*	<i>Vicia</i> sp.	Vetch	•		•			
	<i>Vittadenia australasica</i> var. <i>australasica</i>	Sticky New Holland daisy			•			
	<i>Vittadenia blackii</i>	Narrow-leaf New Holland daisy			•			
	<i>Vittadenia condyloides</i>	Club-hair New Holland daisy			•			
	<i>Vittadenia cuneata</i> var. <i>morrisii</i>	New Holland daisy			•			
	<i>Vittadinia cervicalis</i>	Waisted New Holland daisy	•	•	•			
	<i>Vittadinia gracilis</i>	Woolly New Holland daisy	•		•			
	<i>Vittadinia</i> sp.	New Holland daisy	•	•				
*	<i>Vulpia myuros</i> forma	Fescue	•					
*	<i>Vulpia</i> sp.	Squirrel-tail fescue	•					
	<i>Wurmbea centralis</i> ssp. <i>australis</i>	Inland nancy	•					R
	<i>Wahlenbergia communis</i>	Tufted bluebell	•					
	<i>Wahlenbergia gracilentata</i>	Annual bluebell	•	•				
	<i>Wahlenbergia litticola</i>	Coast bluebell	•					
	<i>Wahlenbergia luteola</i>	Yellow-wash bluebell	•		•			
	<i>Wahlenbergia multicaulis</i>	Tadgell's bluebell	•	•	•			E
	<i>Wahlenbergia preissi</i>	Bluebell	•					
	<i>Wahlenbergia stricta</i> ssp. <i>stricta</i>	Tall bluebell	•	•	•			
	<i>Westringia rigida</i>	Stiff westringia	•					
	<i>Westringia</i> sp.	Westringia	•					
	<i>Wurmbea biglandulosa</i> ssp. <i>flindersica</i>	Flinders Ranges nancy	•	•				R
	<i>Wurmbea dioica</i> ssp. <i>dioica</i>	Early nancy	•		•			

* Introduced species

Appendix 1

Flora Species Lists cont.

Flora List - Wirrabara Range (Wir), Spaniards Gully (SG) and King Tree (KT) cont.

SPECIES	COMMON NAME	STATUS						
		WIR	SG	KT	AUS	SA	NL	
<i>Wurmbea latifolia ssp. vanessae</i>	Star-lily	•		•		R	E	
<i>Xanthorrhoea quadrangulata</i>	Rock grass-tree	•	•	•				
<i>Xerochrysum bracteatum</i>	Golden everlasting	•	•				K	
* <i>Zanuzianskya sp.</i>	Night-phlox			•				

Source: DENR Biological Database of SA; Australian Plant Society (2001); ForestrySA; R. Bates 1980-2008; R. Bates 2009; Native Orchid Society of SA 2009.

Status of species in South Australia under the *National Parks and Wildlife Act, 1972*

(Amendments of Schedule 7, 8 & 9 of Act) Regulations 2008.

Environment Protection and Biodiversity Conservation Act, 1999; Lang and Kraehenbuehl, 1998.

Key to Conservation Ratings:

(AUS - Australia; SA - South Australia; NL - Northern Lofty region)

- E** Endangered
- T** Threatened
- V** Vulnerable
- K** Uncertain
- R** Rare
- U** Uncommon

* *Introduced species*

Appendix 1A - Additional Native Flora List for Conservation Zones outside of the NFNFR's

Additional Native Flora List for Conservation Zones outside of the NFNFR's

SPECIES	COMMON NAME	STATUS		
		AUS	SA	NL
<i>Acacia brachybotrya</i>	Grey mulga bush			
<i>Acrotriche cordata</i>	Blunt-leaf ground-berry			
<i>Amphibromus nervosus</i>	Veined swamp wallaby-grass			
<i>Anogramma leptophylla</i>	Annual fern		R	R
<i>Austrodanthonia aff. laevis</i>	Undescribed wallaby-grass			
<i>Austrostipa multispiculus</i>	Spear grass		R	T
<i>Baumea juncea</i>	Bare twig-rush			
<i>Brachyscome lineariloba</i>	Hard-head daisy			
<i>Calotis lappulacea</i>	Burr-daisy		R	Q
<i>Chamaesyce drummondii</i>	Caustic weed			
<i>Cyperus sanguinolentus</i>	Sedge		R	Q
<i>Daviesia benthamiana ssp. humilis</i>	Mallee bitter-pea		R	E
<i>Dianella longifolia var. grandis</i>	Pale flax-lily		R	T
<i>Dichanthium sericeum ssp. sericeum</i>	Silky blue-grass			R
<i>Diuris palustris x fastudiva</i>	Little donkey-orchid hybrid			Q
<i>Dysphania sp.</i>	Crumbweed			
<i>Elymus rectisetus</i>	Bristly wheat-grass			
<i>Erodium crinitum</i>	Blue heron's-bill			
<i>Euchiton collinus</i>	Creeping cudweed			
<i>Exocarpos sparteus</i>	Slender cherry			
<i>Glycine latrobeana</i>	Clover glycine	V	V	E
<i>Grevillea ilicifolia ssp. ilicifolia</i>	Holly-leaf grevillea			V
<i>Halgania cyanea</i>	Rough blue-flower			
<i>Hypoxis vaginata var. vaginata</i>	Yellow star			
<i>Juncus homalocaulis</i>	Wiry rush		V	T
<i>Juncus kraussii</i>	Sea rush			
<i>Juncus pauciflorus</i>	Loose flower rush			
<i>Lepidium pseudotasmanicum</i>	Shade peppergrass		V	E
<i>Leptorhynchus tetrachaetus</i>	Little buttons			U
<i>Limosella australis</i>	Australian mudwort			R
<i>Lomandra sororia</i>	Sword mat-rush			V
<i>Lotus cruentus</i>	Red-flower lotus			
<i>Maireana enchylaenoides</i>	Wingless fissure plan			
<i>Melaleuca acuminata ssp. acuminata</i>	Mallee honey-myrtle			
<i>Minuria leptophylla</i>	Minnie daisy			
<i>Myriophyllum verrucosum</i>	Milfoil			
<i>Pericaria prostrata</i>	Creeping knotweed			R
<i>Pimelea microcephala ssp. microcephala</i>	Shrubby riceflower			
<i>Poa aff. crassicaudex 'Bulbous'</i>	Thick-stem tussock-grass			
<i>Pogonolepis muelleriana</i>	Stiff cup-flower			

Appendix 1A - Additional Native Flora List for Conservation Zones Outside Of The NFNFR's cont.

Additional Native Flora List for Conservation Zones outside of the NFNFR's cont.

SPECIES	COMMON NAME	STATUS		
		AUS	SA	NL
<i>Pomaderris paniculosa ssp. paniculosa</i>	Mallee pomaderris			Q
<i>Scutellaria humilis</i>	Dwarf skullcap		R	
<i>Senecio aff. dolichocephalus</i>	Woodland groundsel			
<i>Senecio glossanthus</i>	Annual groundsel			
<i>Sida corrugate</i>	Corrugated sida			
<i>Spergularia marina</i>	Salt sand-spurrey			
<i>Stenopetalum lineare</i>	Narrow thread-petal			R
<i>Teucrium corymbosum</i>	Rock germander			
<i>Walwhalleya proluta</i>	Creek panic			

Source: DENR Biological Database of SA; ForestrySA; V. Philpott 2001; R. Bates 2009; Native Orchid Society of SA 2009.

Appendix 2

Fauna Species List

Birds - All Reserves

SPECIES	COMMON NAME	STATUS		
		AUS	SA	NL
<i>Acanthiza apicallis</i>	Inland thornbill			U
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped thornbill			
<i>Acanthiza nana</i>	Yellow thornbill			U
<i>Acanthiza uropygialis</i>	Chestnut-rumped thornbill			U
<i>Acanthogenys rufogularis</i>	Spiny-cheeked honeyeater			
<i>Acanthorhynchus tenuirostris</i>	Eastern spinebill			
<i>Accipiter cirrhocephalus</i>	Collared sparrow-hawk			
<i>Accipiter fasciatus</i>	Brown goshawk			
<i>Accipiter novaehollandiae</i>	Grey goshawk		E	
<i>Aegotheles cristatus</i>	Australian owlet nightjar			
<i>Anas superciliosa</i>	Pacific black duck			
<i>Anthochaera carunculata</i>	Red wattlebird			
<i>Aquila audax</i>	Wedge-tailed eagle			
<i>Ardea alba</i>	Great egret			
<i>Artamus cyanopterus</i>	Dusky woodswallow			
<i>Artamus personatus</i>	Masked woodswallow			
<i>Artamus superciliosus</i>	White-browed woodswallow			
<i>Cacatua galerita</i>	Sulphur crested cockatoo			
<i>Cacatua roseicapilla</i>	Galah			
<i>Cacatua sanguinea</i>	Little corella			
<i>Cacomantis flabelliformis</i>	Fan-tailed cuckoo			
<i>Calamanthus pyrrhopygius</i>	Chestnut-rumped heathwren		V	V
<i>Certhionyx niger</i>	Black honeyeater		U	
<i>Chenonetta jubata</i>	Australian wood duck			
<i>Chrysococcyx basalis</i>	Horsfield's bronze-cuckoo			
<i>Cincloramphus cruralis</i>	Brown songlark			
<i>Cincloramphus mathewsi</i>	Rufous songlark			
<i>Climacteris picumnus</i>	Brown treecreeper			U
<i>Colluricincla harmonica</i>	Grey shrike-thrush			
<i>Columba livia</i>	*Rock dove			
<i>Coracina novaehollandiae</i>	Black-faced cuckoo-shrike			
<i>Corcorax melanorhamphos</i>	White-winged chough		R	V
<i>Corvus coronoides</i>	Australian raven			
<i>Corvus mellori</i>	Little raven			
<i>Cracticus torquatus argenteus</i>	Grey butcherbird			
<i>Cuculus pallidis</i>	Pallid cuckoo			
<i>Dacelo novaeguineae</i>	Laughing kookaburra			
<i>Daphoenositta chrysoptera</i>	Varied Sittella			
<i>Dicaeum hirundinaceum</i>	Mistletoebird			

* Introduced species

Appendix 2

Fauna Species List cont.

Birds - All Reserves cont.

SPECIES	COMMON NAME	STATUS		
		AUS	SA	NL
<i>Dromaius novaehollandiae</i>	Emu			
<i>Drymodes brunneopygia</i>	Southern scrub-robin			V
<i>Egretta novaehollandiae</i>	White-faced heron			
<i>Falco berigora</i>	Brown falcon			
<i>Falco cenchriodes</i>	Nankeen kestrel			
<i>Geopelia placida</i>	Peaceful dove			U
<i>Glossopsitta porphyrocephala</i>	Purple-crowned lorikeet			
<i>Glyciphila melanops</i>	Tawny-crowned honeyeater			U
<i>Grallina cyanoleuca</i>	Magpie lark			
<i>Gymnorhina tibicen</i>	Australian magpie			
<i>Hirundo ariel</i>	Tree martin			
<i>Hirundo neoxena</i>	Welcome swallow			
<i>Lalage tricolor</i>	White-winged triller			
<i>Lichenostomus chrysops</i>	Yellow-faced honeyeater			
<i>Lichenostomus cratitius</i>	Purple-gaped honeyeater			
<i>Lichenostomus leucotis</i>	White-eared honeyeater			
<i>Lichenostomus penicillatus</i>	White-plumed honeyeater			
<i>Lichenostomus virescens</i>	Singing honeyeater			
<i>Malurus lamberti</i>	Variiegated fairy-wren			U
<i>Manorina flavigula</i>	Yellow-throated miner			
<i>Melanodryas cucullata</i>	Hooded robin			
<i>Melithreptus brevirostris</i>	Brown-headed honeyeater			
<i>Melithreptus lunatus</i>	White-naped honeyeater			U
<i>Merops ornatus</i>	Rainbow bee-eater			
<i>Microeca leucophaea (fascinans) assimilis</i>	Jacky winter			
<i>Neophema elegans</i>	Elegant parrot		R	K
<i>Ninox novaeseelandiae</i>	Southern boobook			
<i>Nymphicus hollandicus</i>	Cockatiel			
<i>Ocyphaps lophotes</i>	Crested pigeon			
<i>Pachycephala pectoralis</i>	Golden whistler			
<i>Pachycephala rufiventris</i>	Rufous whistler			
<i>Pardalotus striatus</i>	Striated pardalote			
<i>Petroica boodang boodanf</i>	Scarlet robin		R	V
<i>Petroica goodenovii</i>	Red-capped robin			
<i>Phaps chalcoptera</i>	Common bronzewing			V
<i>Phaps elegans</i>	Brush bronzewing			
<i>Phylidonyris albifrons</i>	White-fronted honeyeater			
<i>Phylidonyris novaehollandiae</i>	New-holland honeyeater			
<i>Platycercus elegans</i>	Adelaide rosella			

* Introduced species

Appendix 2

Fauna Species List

Birds - All Reserves cont.

SPECIES	COMMON NAME	STATUS		
		AUS	SA	NL
<i>Podargus strigoides</i>	Tawny frogmouth			U
<i>Pomatostomus supercilliosus</i>	White-browed babbler			U
<i>Psephotus haematonotus</i>	Red-rumped parrot			
<i>Rhipidura fuliginosa</i>	Grey fantail			
<i>Rhipidura leucophrys</i>	Willy wagtail			
<i>Smicromis brevirostris</i>	Weebill			
<i>Stagonopleura guttata</i>	Diamond firetail		V	V
<i>Strepera versicolor</i>	Grey currawong			
<i>Struthidea cinerea</i>	Apostlebird		U	
<i>Sturnus vulgaris</i>	*Common starling			
<i>Tachybaptus novaehollandiae</i>	Australian grebe			
<i>Todiramphus sancta</i>	Sacred kingfisher			
<i>Trichoglossus haematodus</i>	Rainbow lorikeet			
<i>Turdus merula</i>	*Eurasian blackbird			
<i>Turnix varia</i>	Painted button-quail		R	V
<i>Vanellus miles</i>	Masked lapwing			
<i>Zoothera lunulata</i>	Bassian thrush		R	V
<i>Zosterops lateralis</i>	Silvereye			

Source: B. Gepp, 1975, DENR Biological Database of SA; ForestrySA; V. Philpott 2001; T. Hands, October 2009; Birds SA, 1988 & 2010.

* *Introduced species*

Appendix 2

Fauna Species List cont.

Mammals - All Reserves

SCIENTIFIC NAME	COMMON NAME	STATUS	
		AUS	SA
<i>Capra hircus</i>	*Goat		
<i>Cervus dama</i>	*Fallow deer		
<i>Cervus elaphus</i>	*Red deer		
<i>Chalinolobus gouldii</i>	Gould's wattled bat		
<i>Chalinolobus morio</i>	Chocolate wattled bat		
<i>Felis catus</i>	*Cat		
<i>Lepus capensis</i>	*Hare		
<i>Macropus fuliginosus</i>	Western-grey kangaroo		
<i>Macropus robustus</i>	Euro		
<i>Mormopterus petersi</i>	Southern freetail bat		
<i>Mus musculus</i>	*House mouse		
<i>Nyctophilus geoffroyi</i>	Lesser long-eared bat		
<i>Oryctolagus cuniculus</i>	*Rabbit		
<i>Pseudomys desertor</i>	Desert mouse		
<i>Rattus rattus</i>	*Black rat		
<i>Scotorepens balstoni</i>	Western broad-nosed bat		
<i>Tachyglossus aculeatus</i>	Short-beaked echidna		
<i>Tadarida australis</i>	White-striped freetail bat		
<i>Trichosurus vulpecula</i> [~]	Common brushtail possum		
<i>Vespadelus darlingtoni</i>	Large forest bat		
<i>Vespadelus finlaysoni</i>	Finlayson's cave bat		
<i>Vespadelus vulturnus</i>	Little forest bat		
<i>Vulpes vulpes</i>	*Fox		

[~] Brushtail possum Spaniards Gully record.

Source: DENR Biological Database of SA; ForestrySA; (Adelaide University), Philpott, 2001.

* Introduced species

Appendix 2

Fauna Species List

Reptiles and Amphibians - All Reserves

SCIENTIFIC NAME	COMMON NAME	STATUS	
		AUS	SA
<i>Christinus marmoratus</i>	Marbled gecko		
<i>Crinia riparia</i>	Streambank froglet		
<i>Cryptoblepharus plagiocephalus</i>	Desert wall skink		
<i>Ctenophorus decresii</i>	Tawny dragon*		
<i>Ctenotus orientalis</i>	Eastern spotted ctenotus		
<i>Ctenotus robustus</i>	Eastern striped skink		
<i>Delma mollerii</i>	Adelaide snake-lizard		
<i>Demansia psammophis</i>	Yellow-faced whip-snake*		
<i>Egernia striolata</i>	Eastern tree skink		
<i>Gehyra lazelli</i>	Southern rock dtella		
<i>Hemiergis decresiensis</i>	Three-toed earless skink		
<i>Lampropholis guichenoti</i>	Garden skink		
<i>Lerista bougainvillii</i>	Bougainville's skink		
<i>Litoria ewingi</i>	Brown tree frog		
<i>Menetia greyii</i>	Dwarf skink		
<i>Morethia boulengeri</i>	Common snake-eye		
<i>Morethia obscura</i>	Mallee snake-eye		
<i>Parasuta nigriceps</i>	Mitchell's short-tailed snake		
<i>Pseudonaja textilis</i>	Eastern brown snake		
<i>Pygopus lepidopus</i>	Common scaly-foot*		
<i>Tiliqua rugosa</i>	Sleepy lizard		
<i>Varanus varius</i>	Tree/Lace goanna		R

Source: * Unnamed student survey report in Wirrabara Range for ForestrySA, 1982; DENR Biological Database of SA; ForestrySA; Philpott, 2001.

* *Introduced species*

Appendix 3

Threatened Species Conservation Categories

Category Source:

TAXA	STATUS SOURCE		
	AUSTRALIA	SA	REGIONAL
Plants	Environment Protection and Biodiversity Conservation Act 1999	National Parks and Wildlife Act 1972 Schedules 7, 8, 9 (2008 update)	Lang & Kraehenbuehl (1998)
Birds			Carpenter & Reid (1997)
Mammals			
Reptiles			
Amphibians			

GENERAL CATEGORY	EPBC ACT 1999	NPWS ACT 1972	LANG & KRAEHENBUEHL (1998)	CARPENTER & REID (1997)
Extinct	Extinct (X)		Extinct/Presumed Extinct (X)	Extinct (X)
	Extinct in the Wild (EW)			
	Critically Endangered (CE)			
Threatened	Endangered (E)	Endangered (E)	Endangered (E)	Endangered (E)
			Threatened (T)	
	Vulnerable (V)	Vulnerable (V)	Vulnerable (V)	Vulnerable (V)
			Uncertain (K)	
Rare		Rare (R)	Rare (R)	Rare (R)
				Indeterminate (K)
Uncommon	Conservation Dependent (CD)		Uncommon (U)	Uncommon (U)
			Not yet assessed, but of possible significance (Q)	
Common			*Not of particular significance/ Common (N)	Common (C)

* also indicated by a blank entry

Appendix 4

Land Tenure History

Wirrabarra Range Native Forest Reserve

Section 4, Hundred of Darling

Originally portion of Block 4 - Forest Lease 436 (grazing) was issued to Frederick William Blesing 1/7/1892 - expired 30/6/1913 - Forest Lease 704 (grazing) issued to Edward Roy Offen 2/4/1922 - cancelled 27/7/22 - Forest Lease 719 (grazing) issued to Arthur John Pole 13/12/1926 - expired 12/12/1947.

Section 10, Hundred of Darling

Originally portion of Block 10 - Forest Lease 440 (grazing) was issued to Johannes Paulus Walter 1/7/1892 - portion surrendered and Forest Lease 581 (grazing) was issued to JP Walter commencement date the same as for FL 440 - FL 581 transferred to Benjamin James Stocks 1901 - transferred to Charles Henry Goode 1903 - transferred to Charles Rufus Goode 1907 - expired 30/6/1913 - Forest Lease 692 (grazing) issued to Henry Chamberlain 31/7/1919 - cancelled 11/12/1919 - Forest Lease 702 (grazing) issued to David Anderson 9/11/1920 - transferred to William Bruce Clark 12/4/1926 - transferred to Leslie James Clark 11/8/1939 - expired 8/11/1941.

Section 18, Hundred of Darling

Originally portion of Block 8 - Forest Lease 439 (grazing) was issued to Gottfried Freiderick Havelberg 1/7/1892 - transferred to Johannes Paulus Walter 1894 - transferred to Benjamin James Stocks 25/5/1903 - transferred to Charles Henry Goode 5/4/1906 (?) - transferred to Charles Rufus Goode 19/2/1907 (?) - expired 30/6/1913 - Forest Lease 688 (grazing) issued to William Shuttleworth 2/1/1917 - cancelled 6/8/1919 - Forest Lease 701 (grazing) issued to Edward Dansie 9/11/1920 - transferred to Leslie James Clark 12/4/1926 - expired 8/11/1941.

Section 19, Hundred of Darling

Originally portion of Block No. 11, then Block No. 11SW then Block No. 11SW2 - Forest Lease 434 (grazing) issued to Ernst Gotthilf Blesing 1/7/1892 - expired 30/6/1913 - Forest Lease 691 (grazing) issued to James Joseph Ward 30/6/1919 - transferred to Ada Adelaide Woolford 14/11/1921 - transferred to Sidney S Hook 8/10/1926 - transferred to Arthur John Pole and Richard Pole 1/7/1927 - expired 29/6/1940.

Spaniards Gully Native Forest Reserve

Section 1, Hundred of Darling

Originally portion of Block 1 - Forest Lease 431 (grazing) issued to Michael Lynch, farmer, 1/7/1892 - expired 30/6/1913 - Forest Lease 703 (grazing) issued over Sections 1, 276 to 281, 284, 285 and 288, to Albert Ernest Miller, farmer, 3/4/1922 - cancelled 31/8/1922 - Forest Lease 712 (grazing), over previous sections, issued to Michael Thomas Lynch, farmer, 23/8/1926 - cancelled 17/4/1929.

Section 15, Hundred of Howe

Originally portion of Plantation F, being portion of Forest Reserve 2 - not leased.

Section 220, Hundred of Howe

Originally portion of Block 1, being portion of Forest Reserve 2 - Forest Lease 422 (grazing) issued to Joseph Watt over Block 1 1/7/1892 - surrendered and Forest Lease 555 (grazing) issued to J Watt over Block 1B (portion of original Block 1 and now numbered Sec. 220) commencement date of FL 555 is the same as for FL 422 (it was surrendered because Block 1 was subdivided) - FL 555 expired 30/6/1913 - Forest Lease 699 (grazing) was issued to Joseph Watt 3/2/1920 - expired 2/2/1941 - Annual Licences 1240 and 4854 were issued after this,

King Tree Native Forest Reserve

Sections 301 and 302, Hundred of Darling

Forest Lease 495 (grazing) issued over Sections 293, 295, 298, 299, 301, 302, 303 and 304 to James Bowman 1/1/1894 - lease was surrendered and a Perpetual Lease 6501 was issued over Sections 293, 295, 303 and 304, 1/1/1903 - Sections 301 and 302 had no more leases over them but still part of Forest Reserve No. 2.

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