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MOUNT CRAWFORD FOREST RESERVE

LITTLE MOUNT CRAWFORD NATIVE FOREST RESERVE MANAGEMENT PLAN

September 2016



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INTRODUCTION

Little Mount Crawford Native Forest Reserve (NFR) consists of 176.9 hectares of native vegetation located in the Mount Crawford Forest Reserve in the Southern Mount Lofty Ranges.

The Mount Lofty Ranges Forest Reserves Management Plan (ForestrySA 2014) is the overarching plan for management of forest reserves in the Mount Lofty Ranges and describes the management context and planning framework in greater detail. The Little Mount Crawford Native Forest Reserve Management Plan provides a statement of purpose for the area based upon an assessment of its natural features, management philosophies and community use. It is intended to replace these plans in the future with conservation management plans which will cover the management of all conservation areas within a forest reserve.

The Management Program identifies priority tasks for the reserve. The natural resources data (Appendices 1-2) provides the latest available information on flora and fauna.

Purpose of Reserve

The Little Mount Crawford NFR will be managed and protected to conserve its biodiversity by sustaining its indigenous plant and animal communities as an enduring and dynamic ecosystem.

ForestrySA currently manages approximately 4 000 hectares of native forest reserve in the Mount Lofty Ranges gazetted under the *Forestry Act 1950*.

Location

Little Mount Crawford NFR is located on the eastern side of Mount Road, approximately 8km south-east of Williamstown and 1km due south of Mount Crawford (Figure 1). The reserve comprises Section 147 and 148 and part of both Sections 146 and 390 in the Hundred of Para Wirra, in the District Council of Barossa. The northern section of the reserve consisting of compartment LM1 (147ha) is within the Little Mount Crawford forest locality. The southern section, compartment LM2 (29.9ha) is within Dewells forest locality (Figure 2). Little Mount Crawford NFR is surrounded by commercial pine plantations managed by ForestrySA on the northern, western and southern boundaries. The eastern boundary adjoins farmland used for stock grazing.

The reserve is identified by the peak, Little Mount Crawford (525m). The reserve is also shown in the Emergency Services Map book Mount Lofty Ranges, (Edition 3, 2014), Grid Reference 570 135 – Map 179A.

Administration and Access

The area is under the management control of the Mount Crawford Forest Office, located at 745, Warren Road, (Williamstown to Gumeracha) 7km south-east of Williamstown.

Pedestrian access is permitted during daylight hours except on days when a Total Fire Ban is imposed or where erected signs or notices restrict access to specified areas. There is adequate parking along Mount Road for public access.

Vehicle access to Little Mount Crawford NFR is via Mount Road. Access through NFRs by ForestrySA vehicles and vehicles of contractors employed by ForestrySA on existing tracks and firebreaks, will be permitted for management purposes, including fire prevention and suppression, and pest plant and animal control. Access through NFRs for ForestrySA plantation harvesting transport will be permitted if an acceptable route can be found that minimises disturbance to the biodiversity values of the reserve.

Vehicular access by the public is restricted by provision of the Regulations under the *Forestry Act 1950*.

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, together with their associated fauna. 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.

The 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 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 scientific 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
- may involve regional 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 areas were disturbed by activities such as timber cutting, grazing, 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 the least 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.

VALUES AND CURRENT USES

Conservation

- The Little Mount Crawford NFR is an IUCN (International Union for the Conservation of Nature and Natural Resources 2005) Category IV Reserve. Category IV Reserves are habitat or species management areas, protected areas managed mainly for conservation through management intervention to ensure the maintenance of habitats and/or to meet the requirements of species.
- The reserve conserves remnant native vegetation characteristic of the Mount Lofty Ranges region, where it is estimated less than 15% of the original vegetation remains (Long 1999).
- The reserve has not been burnt since approximately 1920 and provides a benchmark site of special scientific interest for comparison with other areas of remnant native vegetation.

- The reserve has not been grazed since the early 1950s and firewood cutting has not occurred since the early 1970s.
- The reserve contains plant species of high conservation value, and a significant area of regenerating *Eucalyptus leucoxylon* and *Eucalyptus camaldulensis* Grassy Woodland (Blue gum/Red gum), a plant association that is considered poorly represented in the reserve system in the Mount Lofty Ranges.
- The reserve contains large areas of regenerating *Banksia marginata* Woodland, considered poorly represented in conservation reserves in South Australia.
- The reserve contains many mature eucalypts containing hollows, vital for many fauna species as breeding and nesting sites.
- In comparison to other ForestrySA Native Forest Reserves, Little Mount Crawford NFR contains abundant amounts of fallen timber in various stages of decay, decomposing and recycling nutrients on the forest floor, and providing shelter for reptiles and small mammals.
- The north-south ridge system provides a relatively undisturbed example of higher altitude vegetation associations, including areas where *Allocasuarina verticillata* (Drooping she-oak) is the dominant overstorey. These associations are uncommon in this northern section of the Southern Mount Lofty Ranges and are more characteristic of the Flinders

Cultural Heritage

- According to Tindale (1974), the area containing the reserve was occupied by the Peramangk Aboriginal people. In the late 1800s a large camp was known to be present on the banks of the South Para River, within 2 km of the reserve.

Many archeological deposits have cultural significance for Aboriginal people today and many may have scientific significance. Certain sites have landforms that are more likely to contain evidence of Aboriginal historic occupation than others, such as claypans; rocky outcrops; dunes; and bush or forested areas. A site may also be important for historic events that occurred there. Such places may contain no archeological evidence, but can have great significance to Aboriginal people.

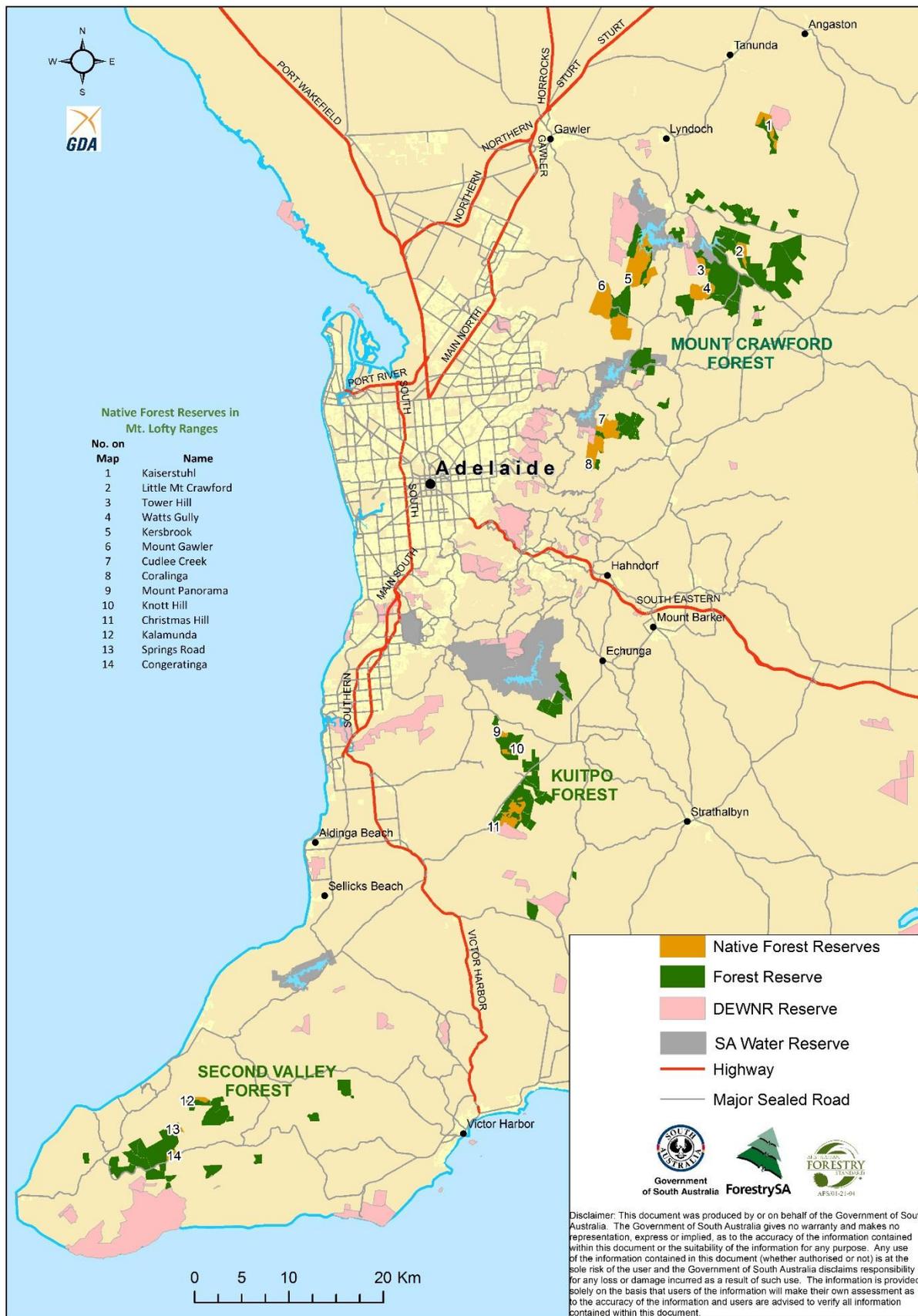
The South Australian Government is responsible for the protection and preservation of sites, objects and remains of sacred, ceremonial, mythological or historical significance to Aboriginal people. Known sites of significance to Aboriginal archaeology, anthropology, history and tradition are listed on the Register of Aboriginal Sites and Objects (*Aboriginal Heritage Act 1988*). There are no known registered sites from within Little Mount Crawford NFR.

Recreation

- ForestrySA recognises the demand for forest-based recreational activities for a variety of users, by providing basic, low impact facilities to ensure there is no adverse impacts on the sustainability of the NFR. The long distance walking trail, the Heysen Trail, passes through Little Mount Crawford NFR. The reserve is close to the Centennial Drive and YHA Camping Ground and is therefore easily accessible for recreational walking. Two marked and self-guided walks are located in the reserve. These include the Jenkins Nature Trail and a section of the Mount Crawford Summit Trail. Brochures for these trails are available at the Mount Crawford Information Centre. There is a parking area adjacent to the start of the nature trail, accessible from Mount Road. All walking trails are closed on days of declared Total Fire Ban. Picnic tables are provided near the beginning of the nature walk on Mount Road. Refuse facilities are not provided. Barbecues and campfires are not permitted within the NFR.

- ForestrySA permits orienteering and rogaining events in suitable locations, as part of the broader community-use management strategy for the NFRs. Orienteering and rogaining are managed to ensure there is no adverse impact on the sustainable management of the reserve. Particularly sensitive areas, including sites with threatened flora and fauna species, significant plant associations and areas posing high risk of damage due to terrain or condition must be avoided during events. Horse riding is not permitted in NFRs within the Mount Crawford Forest region.

Figure 1 - Location of Native Forest Reserves in Mt. Lofty Ranges



PLANNING AND MANAGEMENT FRAMEWORK

Land use within forest reserves is defined through a forest zoning agreement with the Department for Environment - Native Vegetation Council which identifies three main management zones-

- General Forestry zone – commercial plantation areas exempt from requirements of the *Native Vegetation Act 1991*
- Conservation zone – includes gazetted native forest reserves and other areas of remnant native vegetation managed for conservation
- Transition zone – areas of former plantation managed to increase conservation value through removal of pine and other weeds with the ultimate goal to transfer to conservation zone.

Little Mount Crawford NFR is one of fourteen NFRs in the Mount Lofty Ranges. Significant biodiversity assets are also contained within other areas of native vegetation outside of native forest reserves managed as conservation zone. Annual operational plans are prepared for all forest reserves targeting pest plants and animals.

Planning for community use covers both commercial plantation forest and native forest areas. Community use of forest reserves is not restricted to specific areas, but determined according to compatibility and level of impact.

The management objectives for Little Mount Crawford complement existing state and regional plans, including:

- Our Place. Our Future, State Natural Resources Management Plan, South Australia 2012-2017.
- Adelaide and Mount Lofty Ranges Natural Resources Management Plan 2014-15 to 2023-24
- Informing Biodiversity Conservation for the Adelaide and Mount Lofty Ranges Region South Australia.
- Regional Recovery Plan for Threatened Species and Ecological Communities of Adelaide and the Mount Lofty Ranges, South Australia.

ForestrySA maintains certification to the AFS (AS 4708) via the Forest Management System (FMS), which provides a framework of sustainable forest management practices and processes.

A large part of ensuring appropriate management of these forests is to understand, identify, assess and manage environmental aspects and impacts. ForestrySA achieves this through a formal process identified within the FMS and records the details of these in its Risk Register. The controls from this process flow into management procedures and actions on the ground.

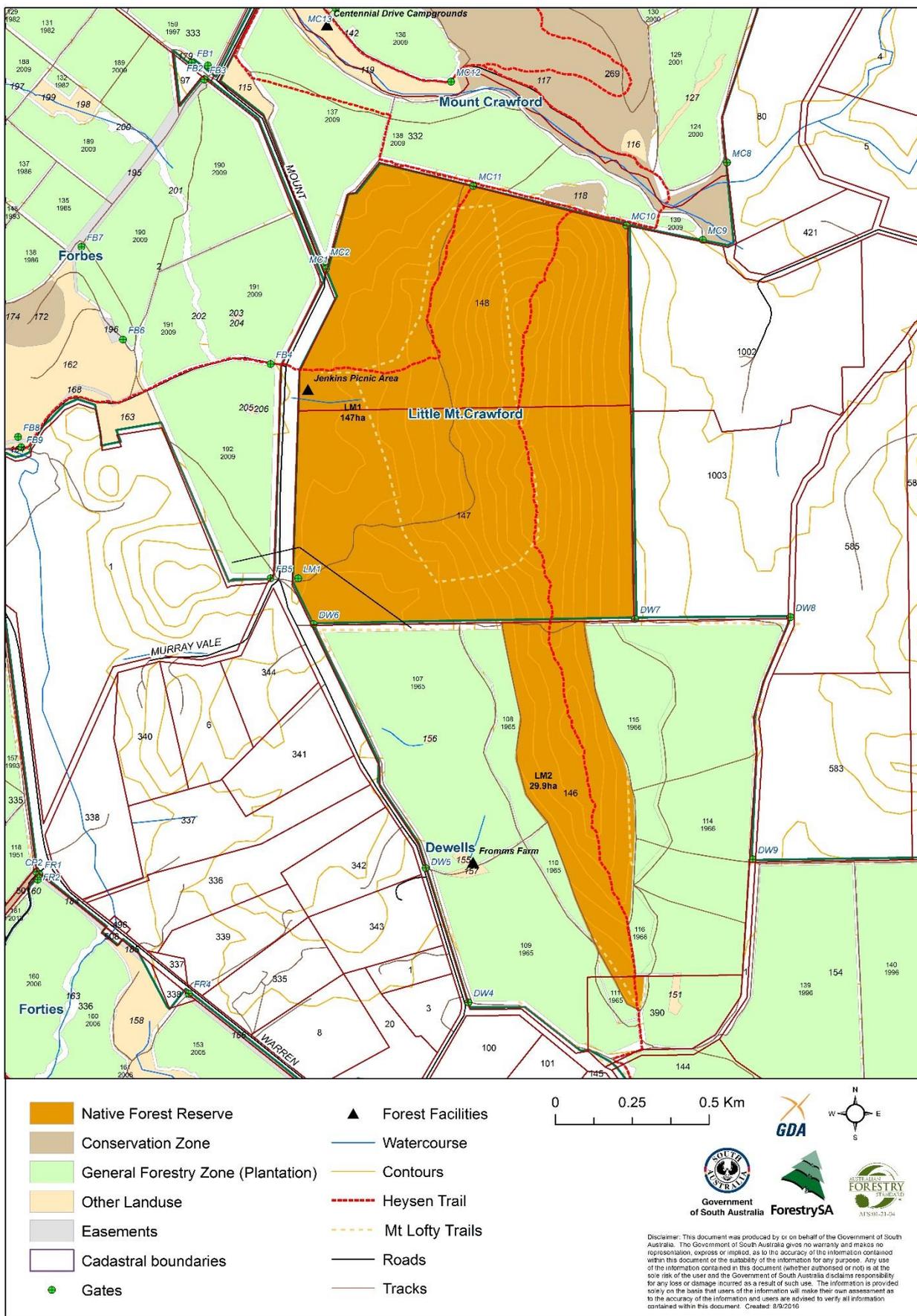
Community Engagement

There is regular engagement with other agencies and community projects to implement integrated work programs and to foster cross agency and community relationships. ForestrySA has a long working relationship with the South Para Biodiversity Project (SPBP) in this management area. This community based natural resource management project started in 2000 and aims to improve integrated land management throughout the region by engaging public and private land managers and natural resource management boards. ForestrySA has been a committee member of SPBP, in its many different guises, since inception.

There is also a long working relationship with Urrbrae TAFE who utilise forest areas for study purposes every year while providing ForestrySA with useful on-ground resources.

ForestrySA also runs a community focussed Friends of the Forest volunteer program which engages community volunteers to undertake various tasks in the forest including feral animal control, weed control, flora and fauna surveys and other monitoring.

Figure 2 – Little Mount Crawford Native Forest Reserve



NATURAL RESOURCES

Climate

The area experiences a typical Mediterranean-type climate with cool, wet winters and warm, dry summers. The area receives an average rainfall of 750mm. Average daily temperatures have been recorded between 12-13°C for winter months and 21-27°C for summer. However, summer temperatures can occasionally exceed 40°C and daily minimum temperatures can fall well below 0°C.

Detailed climatological information has been collected at the Mount Crawford Forest office since 1954. This information is available on the Bureau of Meteorology website (<http://www.bom.gov.au>).

Geomorphology and Soils

There is a north-south ridge traversing the reserve with escarpment slopes to the east and west. These grade to erosion plains, formed when the original land surface was formed primarily by stream erosion.

The soils are complex and depend upon the parent material and topographic location. The dominant soils tend to be yellow and grey-brown podzols on the slopes, with laterised podzols along the rocky ridge top and north facing slopes.

Mineral Exploration Licence (EL) 5805 exists over Little Mount Crawford NFR. This EL permits the licensee to apply for consent to prospect, explore, or recover the resource in the case of discovery. Exploration Licence information can be viewed online at the South Australian Resource Information Geoserver (SARIG) available at <https://sarig.pir.sa.gov.au/Map>.

Hydrology and Topography

The reserve is located in the South Para sub-catchment of the Gawler River. There are only minor drainage lines within the NFR that drain to the north-west into the Warren Reservoir. Two shallow gullies occur respectively in the north-west and south-west corners of Section 148 and Section 147. They drain in a westerly direction from the north-south ridge. A small dam is present near the southern boundary of Section 147. Little Mount Crawford is 525 m above sea level and is the highest point in the reserve.

Vegetation

In 1924 the area was described by Adamson and Osborn, and in 1937 by Wood, as Blue gum savannah forest:

'The canopy is open, in many cases indeed the trees stand quite apart from one another giving a park-like effect. The blue gum is frequently associated with the manna gum in regions of higher rainfall and in gullies where the red gum usually occurs. Where rocky areas are present on upper slopes and ridges the Sheoak can become the dominant species. On mid slopes with shallow soils pink gum is the dominant species. It is now recognised that this species also occurs with the long-leafed box.'

The area has been well surveyed by the former Woods and Forests Department in 1985, DEWNR in 2000 as part of the biological survey of the Mount Lofty Ranges, grassy woodland surveys in 2001/02 by M. Hyde and other smaller surveys as part of prescribed burn planning and weed mapping. All of the survey results contribute to knowledge of the reserve and species lists are maintained by ForestrySA and information is also sent to DEWNR for inclusion into the Biological Database of South Australia (BDBSA). The survey of 2000 recorded the Nationally Vulnerable species, Pale leek-orchid (*Prasophyllum pallidum*). Appendix 1 includes other plant species recorded from these surveys.

A fenced 30 x 40m enclosure was erected in 2007 within the reserve in the south-west corner of LM1 in collaboration with the Nature Conservation Society (NCS) of South Australia to monitor grazing pressure and survival and recruitment of *Banksia marginata* (Silver banksia). The enclosure is weeded and monitored annually. A summary of the monitoring for this enclosure and another one located within Big Flat locality was published in 2011 (Paton, P. 2011) and is available online at the NCS website.

The following vegetation associations have been identified within the reserve

***Eucalyptus fasciculosa* (Pink gum)/*Eucalyptus goniocalyx* (Long-leaf box) (+/- *Banksia marginata* (Silver banksia) Low Woodland**

Scattered and stunted *E. fasciculosa* and *E. goniocalyx* (Plate 1) occur in the southern and south-east sections of the reserve, with the former species predominating on the western slope. The moderate escarpment slope to the east is characterised by Low Open Woodland of *E. goniocalyx*. Most are dense multi-stemmed coppice regeneration, too small to contain nesting hollows. However, both eucalypt species occasionally occur in larger form, some with hollows, on both aspects. They occur over a moderately-dense understorey of predominantly *Banksia marginata* (Plate 2), *Acacia pycnantha*, *Xanthorrhoea semiplana*, *Spyridium parvifolium*, *Hibbertia sericea* and *Lepidosperma carphoides*.

***Eucalyptus leucoxylon* ssp. *leucoxylon* (SA blue gum)/*Eucalyptus fasciculosa* Woodland**

E. leucoxylon occurs in the western section of the reserve, on the lower western slopes. *E. fasciculosa* occurs on the remainder of these slopes. Observations indicate that there is more coppice regeneration among the *E. fasciculosa* on the gentler slopes, which presumably reflects greater accessibility for removing firewood. They occur over a diverse shrub and ground flora containing *Acacia pycnantha*, *Xanthorrhoea semiplana*, *Callitris gracilis*, *Acrotriche depressa* (conservation status, Regionally Rare) (Plate 3), *Acacia myrtifolia* var. *myrtifolia*, *Spyridium parvifolium*, *Hibbertia exutiacies*, *Lepidosperma carphoides* and *Vittadinia gracilis*.

***Eucalyptus camaldulensis* (River red gum)/*Eucalyptus leucoxylon* Grassy Woodland**

E. camaldulensis/*E. leucoxylon* Grassy Woodland occurs primarily in the north-west and south-west section of the reserve. This area contains an understorey of *Callitris gracilis*, *Acacia pycnantha*, *Melicactus dentatus* and *Olearia ramulosa*, with native and introduced grasses. Due to the significance and scarcity of grassy woodland habitats (Plate 5) there is a separate management plan for these areas (Paton 2005), outlining priorities and actions for protection and rehabilitation.

***Allocasuarina verticillata* (Drooping sheoak) Low Woodland**

This association (Plate 6) can be found predominantly along the north-south ridge and within the eastern section of the reserve. Shrub and ground flora is diverse and may comprise *Callitris gracilis*, *Chelianthes austrotenuifolia*, *Acacia pycnantha*, *Spyridium parvifolium*, *Banksia marginata*, *Xanthorrhoea semiplana*, *Lepidosperma carphoides*, *Bursaria spinosa*, *Acacia paradoxa* and *Leptospermum myrsinoides*.

The reserve also contains a large amount of naturally fallen timber. This organic material is an important resource for the degraders and decomposers found in the litter fauna (e.g. termites, crickets and mites), decomposing and recycling nutrients on the forest floor. Fallen timber is also a valuable resource for reptiles and small mammals seeking shelter.

Introduced Plants

Weed mapping was updated in the reserve in 2012. The biggest threat is from Gorse (*Ulex europaeus*). Gorse forms dense, impenetrable thickets that exclude all indigenous vegetation, and provide harbour to pest animals such as rabbits and foxes. It can however also provide important refuges for native animals and eradication of large areas should be staged. There has been regular bushcare control of gorse thickets for the last eight years which will be maintained as new plants

regenerate from the soil seedbank. Boneseed (*Chrysanthemoides monilifera*) is also present within the reserve but in lower densities than gorse due to consistent control efforts. Boneseed is capable of completely dominating invaded habitat, eliminating most indigenous ground-flora and prevent virtually all overstorey regeneration (Muyt 2001).

Smaller infestations of Olive (*Olea europaea*), Hawthorn (*Crataegus sinaica*), Briar rose (*Rosa rubiginosa*) Wild plum, (*Prunus* sp.), Watsonia (*Watsonia bulbifera*) and Blackberry (*Rubus* sp.) have all been controlled and will require ongoing monitoring for any regeneration. A regular wild pine control program is also implemented especially in areas adjacent to plantations where re-infestation occurs more easily. Other introduced plants are included in Appendix 1.



Plate 1: *Eucalyptus fasciculosa*/*E. goniocalyx* in north-west section of reserve.



Plate 2: *Banksia marginata* remnant in southern section of reserve. Inset: *B. marginata* regeneration.



Plate 3 – *Acrotriche depressa*, Regionally Rare plant found throughout the reserve.



Plate 4 – *Eucalyptus camaldulensis* and *Melicytus dentatus*



Plate 5: Grassy Woodland area in south-west of reserve.



Plate 6: Dense stand of *Allocasuarina verticillata* in northern section of reserve.

Fauna

Three fauna surveys have been carried out within the reserve: In 1985 Woods and Forests staff conducted an ecological survey within the reserve; in 2000 DEWNR included one vertebrate site when conducting the Mount Lofty Ranges biological survey and a survey of bat species was undertaken in 1996 (H. Nicholson, Adelaide University) as part of a student project to examine the activity patterns of insectivorous bats in the reserve.

Birds

The reserve has a diverse range of bird species, including the Yellow-tailed black cockatoo (*Calyptorhynchus funereus*) with a conservation status of Vulnerable in South Australia (Appendix 2). NCS conduct annual bird surveys as part of the long running MLR Woodland Bird Survey. In 2014 ForestrySA commissioned NCS to undertake an analysis of the bird survey results located on forest reserves from 2001-12 (Blackwood & Collard 2014, unpub). For the site located within Little Mount Crawford bird species richness and diversity both displayed trends of slight increase over the study period. No pattern was detected in bird abundance at this site. Scarlet robins (*Petroica boodang boodang*) were observed at the site in five of the study years, with most of these being since 2007, indicating a slight increase in numbers. White-winged Choughs (*Corcorax melanorhamphos whitaea*) were observed in groups at the site in nine of the study years, with numbers appearing to be stable.

Mammals

The most abundant mammal species observed in the reserve is the Western grey Kangaroo (*Macropus fuliginosus*), as the woodland habitat provides abundant food and shelter. The Short-beaked Echidna (*Tachyglossus aculeatus*) and Bush rat (*Rattus fuscipes*) have been recorded, and both possum species, Common brushtail (*Trichosurus vulpecula*) and Common ringtail (*Pseudocheirus peregrinus*) have been observed (Appendix 2). The Southern Mount Lofty Ranges survey (2000) detected both species of possum associated with areas of the reserve where hollows are abundant. This observation highlights the dependence on hollows, and the impact of the presence of tree hollows, as these possums were less abundant in areas where hollows are scarce (D. Armstrong, pers. obs.).

In 1996 a university project studied the foraging habitat of bats in the reserve. Five species were detected (Appendix 2). Given the presence of mature *Eucalyptus* spp. within the reserve, it is likely further bat species known to occur in the Mount Lofty Ranges may be present. Most of the bat species in this region are dependent upon tree hollows and sites under loose bark for nesting and roosting.

Reptiles and Amphibians

Nine reptile and two amphibian species have been recorded (Appendix 2). However, a small dam within the reserve provides opportunity for other frog species to be present.

Introduced Animals

Four introduced species have been detected within the reserve, Fallow deer (*Cervus dama*); European rabbit (*Oryctolagus cuniculus*); Black rat (*Rattus rattus*) and Red fox (*Vulpes vulpes*) (Appendix 2).

Foxes may use native vegetation for shelter and breeding sites. They are known to prey on native wildlife and are also vectors for many noxious weed species including olives and boneseed.

Deer numbers have greatly increased across the region in recent times. The presence of continuous cover and food, in both pine plantations and native vegetation, enables deer to disperse over a wide area of native forest and throughout farmed areas. As well as increasing total grazing pressure deer also cause extensive physical damage to native vegetation, especially during the rutting season (late summer-autumn) when saplings or tall shrubs with stem diameter 3-5cm (e.g. *Banksia marginata*) may be ringbarked or broken off by bucks. Another major concern is the potential for feral deer to act as carriers for livestock diseases. ForestrySA implements feral animal control programs on a consistent basis through the Friends of the Forest volunteer program. .

Abundant Native Animals

By providing permanent water and pasture, agriculture has increased the food and water resources available to kangaroos and other native animals needing more open areas, while nearby remnant native vegetation provides shelter and havens for breeding. Native animals may increase to a population size that a remnant block of native vegetation is no longer capable of supporting. Fences may also be damaged or undermined to an extent where they cease to be effective in excluding stock.

Western grey kangaroos live mostly in native vegetation, but often feed on adjacent pastures - Little Mount Crawford NFR adjoins cleared and agricultural land. In large numbers they may damage fences when moving to and from feeding or drinking sites and prevent regeneration of native vegetation. There is evidence of fence undermining along the eastern boundary (which adjoins grazing pasture), and grazing on various understorey vegetation.

Control for abundant native species occurs only when there are regional control programs in place involving private landholders and other public land managers. Private landholders can obtain destruction permits under the National Parks & Wildlife Act, which allows the shooting of a prescribed number of animals.

Introduced Disease

Many root pathogens are known to cause root-rot disease in Australian flora species, but the introduced *Phytophthora cinnamomi* (Pc) has had the greatest effect and poses the greatest threat. Dieback caused by *Phytophthora cinnamomi* is listed as a key threatening process under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Commonwealth of Australia 2014)

Pc 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.

There are patches of dead, and dying, *Xanthorrhoea* spp. within the reserve. The cause has not been confirmed, but is symptomatic of Pc (Plate 7).



Plate 7: Suspected Pc, infecting *Xanthorrhoea semiplana*.

The whole of the Mount Lofty Ranges is deemed to be a High Risk Area, where Pc is known to be present, or is likely to become established (Phytophthora Technical Group 2003). Within the region there are Risk Management Zones that have been designated by DEWNR. Little Mount Crawford NFR falls within a Moderate Risk Management Zone, apart from the area surrounding the suspected Pc presence in the north-west section of the reserve, which is classed as a High Risk Zone. The adoption of management strategies appropriate to the zone, and any activities in that zone, can minimise the spread of Pc. These strategies, as outlined in the *Phytophthora Management Guidelines* (Government of South Australia 2006), must be incorporated into the planning of high-risk activities.

LAND USE

The natural history of the area has been broadly described in the "*Natural History of the Adelaide Region*" published by the Royal Society of SA in 1976.

Acquisition and Name

The land tenure prior to purchase by ForestrySA in 1972 is outlined in Appendix 3.

The reserve was formerly known as 'Jenkins Scrub' referring to ownership of the land by the Jenkins family. Little Mount Crawford was presumably named due to its proximity to Mount Crawford (562 metres above sea level) and has been adopted as the reserve name.

Gordon and Manser in their book, '*History of Mount Crawford*', provide background information about the naming of the area:

'The origin of the name Mount Crawford seems to be impossible to establish now. Legend has it that the hill was named after the Second-in-charge of a surveying party. However, Cockburn says it was named after a man who had a hut at its foot by the South Para River, and used to overland stock in 1838. There is a story about some bushrangers involved in thieving who were caught and hanged at this camp, but Cockburn thought the Crawford in this case was Mr James Coutts Crawford, known to have been an overlander. Another man, Mr A C Saunders, well known for his letters to the papers in the 1920s wrote of a family of Crawfords. The grandfather Mr E J F Crawford, owned a brewery in Hindmarsh and his grandsons, according to Mr Saunders, were sheep farmers at Mount Crawford, hence the name. They were E J F & J F Crawford, the latter was known for his exploring activities, though they did not arrive until 1839. So it seems the truth may never been known, yet perhaps, it is combination of all three stories'.

Timber Cutting

Timber cutting for firewood and sleepers from large eucalypts was commonly practised throughout the Mount Crawford area. The smaller diameter trees were presumably cut for firewood. Local firewood collecting ceased about 1975.

The result of timber cutting is evidenced by the abundant coppice regeneration of *E. fasciculosa*. Firewood was predominantly for local use only. The presence of some large, old *E. camaldulensis* in the reserve is probably due to their poor timber value.

Grazing

The area has not been grazed by stock since the early 1950s. Casual observations since the 1980s suggest there has been significant growth and recruitment of *Allocasuarina verticillata*, with some areas now appearing as quite dense woodland.

Fire

The area has not been burnt since the 1920s. The reserve in its current condition provides a benchmark for investigating the impacts of a long absence of fire, however exclusion of fire for such a long period has the potential to restrict the regeneration of some flora species that are fire dependant for germination. A proportion of the reserve will be maintained as long unburnt but there are plans to implement a prescribed burn in the southern part of the reserve in compartment LM2. This will create a mixed age class of vegetation within the reserve and reduce the risk of the whole reserve burning in one bushfire event. This prescribed burn is a recommendation arising from the *South Para Collaborative Fire Management Plan* (DEWNR 2015), a plan developed through a partnership between State Government land management agencies (ForestrySA, DEWNR & SA Water) and the South Australian Country Fire Service (CFS) to promote collaborative bushfire risk mitigation.

ForestrySA is also a member of the Mt Lofty Ranges Fire Cooperative, which includes DEWNR, SA Water, and the CFS. This cooperative seeks to integrate prescribed burning programs and to coordinate bushfire responses in the region.

MANAGEMENT PROGRAM

The Management actions proposed will be carried out in accordance with guidelines contained in the relevant procedural policies. In determining priority for management of the reserve's natural or physical resources, it is considered that:

- 1 = High priority; threat has a high capacity to degrade the resource;
- 2 = Medium priority;
- 3 = Low priority; threat has a low capacity to degrade the resource.

OBJECTIVE: Conservation Management		Priority for Action
Goals	Performance Indicator(s)	
Manage the reserve for the conservation of biodiversity.	No loss of species identified within the survey results.	1
Undertake surveys of the reserve to build on knowledge base.	Periodic surveys undertaken to identify and monitor species diversity.	1
New survey information is provided to DEWNR for inclusion in Biological Database of SA	Survey data is supplied to DEWNR and is available to ForestrySA and other agencies/groups/individuals for retrieval	1

OBJECTIVE: Community Use		Priority for Action
Goals	Performance Indicator(s)	
Provide visitors with appropriate information regarding the reserve values.	Educational material available at reserve and/or Mount Crawford Forest Information Centre. Signs erected at appropriate locations.	2
Maintain walking trails and signage to acceptable specified standards.	Condition of walking trails and signage in the reserve - trails should be free from erosion, clear and accessible. Signs maintained in good condition. Trails relocated if required.	3

OBJECTIVE: Protection		Priority for Action
Goals	Performance Indicator(s)	
Implement management actions to reduce the spread of <i>Phytophthora</i> , other plant pathogens and weed seeds within the reserve.	Area affected by <i>Phytophthora</i> does not increase. No new pathogens or weed species introduced.	1
Minimise the impact of wildfire using a range of fire protection measures available to ForestrySA, including the use of prescribed burning. Continue to work with the Mt Lofty Ranges Fire Cooperative to integrate prescribed burning programs and to coordinate bushfire responses in these reserves.	Annual wildfire prevention programs are completed. Fire-breaks are maintained. Prescribed burning implemented with associated monitoring. Public access and use is regulated in periods of high fire danger.	1

OBJECTIVE: Protection		Priority for Action
Goals	Performance Indicator(s)	
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 users or ForestrySA.	1
Reduce the impacts resulting from fragmentation and/or edge effects between and adjacent to sections of NFR.	Possible options identified for rehabilitation of adjoining areas. Where possible adjoining landholders engaged in conservation works (through existing community / natural resource management programs)	2
Minimise the impact of introduced plants and/or animals on the conservation values of the reserve.	A reduction in the distribution and number of introduced plant and animal species in the reserve. Annual weed control program in place.	2
	Continue implementation of wild pine control programs within the reserve	1
	Implement management recommendations for grassy woodland areas	1
Continue to maintain external fences.	Boundary fence line is in a serviceable condition.	3

OBJECTIVE: Rehabilitation		Priority for Action
Goals	Performance Indicator(s)	
Rehabilitate and/or revegetate degraded areas within the reserve.	Number of hectares rehabilitated relative to the previous year	2
Rehabilitate and/or revegetate tracks and/or firebreaks no longer required for vehicle access.	Number of tracks and/or firebreaks relative to previous year.	3
Remove infrastructure, e.g. fence, wire, posts no longer in use	Redundant infrastructure removed from reserve	3

OBJECTIVE: Stakeholder Involvement		Priority for Action
Goals	Performance Indicator(s)	
Maintain links with other 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
Maintain communication with adjacent landholders and pursue opportunities for co-operative management.	Number of complaints received regarding management.	As required

OBJECTIVE: Involvement Goals	Stakeholder Performance Indicator(s)	Priority for Action
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

APPENDIX 1 FLORA SPECIES LIST

Weed	SPECIES	COMMON NAME	Conservation Status			FAMILY
			AUS	SA	AMLR	
	<i>Acacia myrtifolia</i>	Myrtle wattle				Leguminosae
	<i>Acacia paradoxa</i>	Kangaroo thorn				Leguminosae
	<i>Acacia pycnantha</i>	Golden wattle				Leguminosae
	<i>Acacia retinodes var. retinodes</i>	Wirilda				Leguminosae
	<i>Acaena echinata</i>	Sheep's burr				Rosaceae
	<i>Acaena novae-zelandiae</i>	Biddy-biddy				Rosaceae
*	<i>Acetosella vulgaris</i>	Sorrel				Polygonaceae
	<i>Acrotriche depressa</i>	Native currant			RA	Epacridaceae
	<i>Acrotriche serrulata</i>	Cushion ground-berry				Epacridaceae
*	<i>Aira caryophyllea</i>	Silvery hair-grass				Gramineae
*	<i>Aira cupaniana</i>	Small Hair-grass				Gramineae
	<i>Allocasuarina muelleriana ssp. muelleriana</i>	Common Oak-bush				Casuarinaceae
	<i>Allocasuarina verticillata</i>	Drooping sheoak				Casuarinaceae
	<i>Amyema miquelii</i>	Box mistletoe				Loranthaceae
*	<i>Anagallis arvensis</i>	Pimpernel				Primulaceae
	<i>Aphelia pumilio</i>	Dwarf aphelia				Centrolepidaceae
*	<i>Arctotheca calendula</i>	Cape Weed				Compositae
	<i>Arthropodium strictum</i>	Common vanilla-lily				Liliaceae
*	<i>Asclepias rotundifolia</i>	Broad-leaf cotton-bush				Asclepiadaceae
	<i>Astroloma humifusum</i>	Cranberry heath				Epacridaceae
	<i>Austrostipa mollis</i>	Soft Spear-grass				Gramineae
	<i>Austrostipa semibarbata</i>	Fibrous spear-grass				Gramineae
*	<i>Avena barbata</i>	Bearded oat				Gramineae
	<i>Banksia marginata</i>	Silver banksia				Proteaceae
	<i>Blennospora drummondii</i>	Dwarf button-flower				Compositae
	<i>Brachyscome parvula</i>	Coast daisy		R	EN	Compositae
*	<i>Briza maxima</i>	Large quaking-grass				Gramineae
*	<i>Briza minor</i>	Lesser quaking-grass				Gramineae
*	<i>Bromus diandrus</i>	Great Brome				Gramineae
	<i>Brunonia australis</i>	Blue pincushion				Goodeniaceae
	<i>Bulbine bulbosa</i>	Bulbine lily				Liliaceae
	<i>Burchardia umbellata</i>	Milkmaids				Liliaceae
	<i>Bursaria spinosa</i>	Sweet bursaria				Pittosporaceae
	<i>Bursaria spinosa ssp.</i>	Bursaria				Pittosporaceae
	<i>Caesia calliantha</i>	Blue grass-lily				Liliaceae
	<i>Caladenia sp.</i>	Spider-orchid				Orchidaceae
	<i>Caladenia tentaculata</i>	King spider-orchid				Orchidaceae
	<i>Callitris gracilis</i>	Southern cypress pine			LC	Cupressaceae
	<i>Calocephalus citreus</i>	Lemon beauty-heads			RA	Compositae
	<i>Calochilus sp.</i>	Beard-orchid				Orchidaceae

Weed	SPECIES	COMMON NAME	Conservation Status			FAMILY
			AUS	SA	AMLR	
	<i>Calytrix tetragona</i>	Common fringe-myrtle				Myrtaceae
	<i>Carex breviculmis</i>	Short-stem sedge				Cyperaceae
*	<i>Centaurium erythraea</i>	Common centaury				Gentianaceae
*	<i>Centranthus rubra</i>	Red valerian				Valerianaceae
	<i>Centrolepis aristata</i>	Pointed centrolepis				Centrolepidaceae
	<i>Centrolepis strigosa</i> ssp. <i>strigosa</i>	Hairy centrolepis				Centrolepidaceae
	<i>Chamaescilla corymbosa</i> var. <i>corymbosa</i>	Blue squill				Liliaceae
	<i>Cheilanthes austrotenuifolia</i>	Annual rock-fern				Adiantaceae
*	<i>Chrysanthemoides monilifera</i>	Boneseed				Compositae
	<i>Clematis microphylla</i>	Old Man's Beard				Ranunculaceae
	<i>Convolvulus angustissimus</i> ssp. <i>angustissimus</i>	Australian bindweed				Convolvulaceae
	<i>Convolvulus erubescens</i> complex	Bindweed				Convolvulaceae
	<i>Corybas</i> sp.	Helmet orchid				Orchidaceae
	<i>Craspedia variabilis</i>	Billy-buttons				Compositae
*	<i>Crataegus sinaica</i>	Hawthorn				Rosaceae
	<i>Cymbonotus preissianus</i>	Austral bear's-ear			RA	Compositae
	<i>Cynoglossum australe</i>	Australian Hound's-tongue			RA	Gramineae
	<i>Cynoglossum suaveolens</i>	Sweet hound's-tongue			NT	Boraginaceae
	<i>Cynoglossum suaveolens</i>	Sweet Hound's-tongue			NT	Boraginaceae
*	<i>Cynosurus echinatus</i>	Rough dog's-tail grass				Gramineae
	<i>Daucus glochidiatus</i>	Native carrot				Umbelliferae
	<i>Daviesia leptophylla</i>	Narrow-leaf Bitter-pea				Leguminosae
	<i>Daviesia ulicifolia</i> ssp. <i>ulicifolia</i>	Gorse Bitter-pea				Leguminosae
	<i>Dianella revoluta</i> var. <i>revoluta</i>	Black-anther flax-lily				Liliaceae
*	<i>Disa bracteata</i>	South-African orchid				Orchidaceae
	<i>Diuris behrii</i>	Behr's cowslip orchid		V	V	Orchidaceae
	<i>Dodonaea viscosa</i> ssp.	Sticky Hop-bush				Sapindaceae
	<i>Drosera macrantha</i> ssp. <i>planchonii</i>	Climbing sundew				Droseraceae
*	<i>Echium plantagineum</i>	Salvation Jane				Boraginaceae
	<i>Eucalyptus camaldulensis</i> var. <i>camaldulensis</i>	River red gum				Myrtaceae
	<i>Eucalyptus fasciculosa</i>	Pink gum		R	NT	Myrtaceae
	<i>Eucalyptus goniocalyx</i> ssp. <i>goniocalyx</i>	Long-leaf box				Myrtaceae
	<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	South Australian blue gum				Myrtaceae
	<i>Euchiton involucratus</i>	Star cudweed				Compositae
	<i>Euchiton</i> sp.	Cudweed				Compositae
	<i>Exocarpos cupressiformis</i>	Native cherry				Santalaceae
	<i>Galium gaudichaudii</i> ssp. <i>gaudichaudii</i>	Rough Bedstraw				Rubiaceae
*	<i>Genista monspessulana</i>	Montpellier broom				Leguminosae
	<i>Geranium potentilloides</i> var. <i>potentilloides</i>	Downy geranium			LC	Geraniaceae
	<i>Geranium</i> sp.	Geranium				Geraniaceae
	<i>Glossodia major</i>	Purple cockatoo				Orchidaceae

Weed	SPECIES	COMMON NAME	Conservation Status			FAMILY
			AUS	SA	AMLR	
	<i>Gonocarpus elatus</i>	Hill raspwort				Haloragaceae
	<i>Gonocarpus tetragynus</i>	Small-leaf raspwort				Haloragaceae
	<i>Goodenia geniculata</i>	Bent goodenia				Goodeniaceae
	<i>Hakea rostrata</i>	Beaked hakea				Proteaceae
	<i>Hibbertia exutiacies</i>	Prickly guinea-flower				Dilleniaceae
	<i>Hibbertia riparia</i>	Erect guinea-flower				Dilleniaceae
	<i>Hibbertia sericea</i>	Silky Guinea-flower				Dilleniaceae
*	<i>Holcus lanatus</i>	Yorkshire fog				Gramineae
*	<i>Holcus lanatus</i>	Yorkshire Fog				Gramineae
	<i>Hydrocotyle callicarpa</i>	Tiny pennywort				Umbelliferae
	<i>Hydrocotyle hirta</i>	Hairy pennywort			NT	Umbelliferae
	<i>Hydrocotyle laxiflora</i>	Stinking pennywort				Umbelliferae
*	<i>Hypericum perforatum</i>	St. Johns wort				Guttiferae
*	<i>Hypericum sp.</i>	St John's Wort				Guttiferae
*	<i>Hypochaeris glabra</i>	Smooth cat's ear				Compositae
*	<i>Hypochaeris radicata</i>	Rough cat's ear				Compositae
	<i>Hypoxis vaginata var. vaginata</i>	Yellow star				Hypoxidaceae
	<i>Isolepis marginata</i>	Little club-rush				Cyperaceae
	<i>Isopogon ceratophyllus</i>	Horny cone-bush				Proteaceae
*	<i>Juncus capitatus</i>	Dwarf rush				Juncaceae
	<i>Juncus pallidus</i>	Pale rush				Juncaceae
	<i>Lagenophora huegelii</i>	Coarse bottle-daisy				Compositae
	<i>Lepidosperma carphoides</i>	Black rapier-sedge				Cyperaceae
	<i>Lepidosperma semiteres</i>	Wire rapier-sedge				Cyperaceae
	<i>Leptorhynchos squamatus ssp. squamatus</i>	Scaly buttons				Compositae
	<i>Leptospermum myrsinoides</i>	Heath tea-tree				Myrtaceae
	<i>Leucopogon virgatus</i>	Common beard-heath				Epacridaceae
	<i>Levenhookia pusilla</i>	Tiny stylewort				Stylidiaceae
*	<i>Linum trigynum</i>	French flax				Linaceae
	<i>Lomandra fibrata</i>	Mount Lofty matt-rush				Liliaceae
	<i>Lomandra micrantha ssp. micrantha</i>	Small-flower mat-rush				Liliaceae
	<i>Lomandra multiflora ssp. dura</i>	Hard mat-rush				Liliaceae
	<i>Lomandra sororia</i>	Small mat-rush			NT	Liliaceae
	<i>Lycium australe</i>	Australian boxthorn			EN	Solanaceae
	<i>Lythrum hyssopifolia</i>	Lesser loosestrife				Lythraceae
	<i>Melicytus dentatus</i>	Tree violet			RA	Violaceae
	<i>Microlaena stipoides var. stipoides</i>	Weeping rice-grass				Gramineae
	<i>Microseris lanceolata</i>	Yam daisy				Compositae
	<i>Microtis arenaria</i>	Notched onion-orchid				Orchidaceae
	<i>Microtis parviflora</i>	Slender onion-orchid			LC	Orchidaceae
	<i>Millotia tenuifolia var. tenuifolia</i>	Soft millotia				Compositae
	<i>Myosotis australis</i>	Austral forget-me-not			RA	Boraginaceae

Weed	SPECIES	COMMON NAME	Conservation Status			FAMILY
			AUS	SA	AMLR	
	<i>Neurachne alopecuroidea</i>	Fox-tail mulga-grass				Gramineae
*	<i>Olea europaea ssp. europaea</i>	Olive				Oleaceae
	<i>Olearia ramulosa</i>	Twiggy daisy-bush				Compositae
	<i>Olearia ramulosa</i>	Daisy-bush				Compositae
*	<i>Onopordum acanthium</i>	Scotch thistle				Compositae
	<i>Opercularia varia</i>	Variable Stinkweed				Rubiaceae
*	<i>Oxalis corniculata ssp. corniculata</i>	Creeping wood-sorrel				Oxalidaceae
	<i>Oxalis perennans</i>	Native sorrel				Oxalidaceae
*	<i>Pentaschistis pallida</i>	Pussy tail				Gramineae
	<i>Petrorhagia dubia</i>	Velvet Pink				Caryophyllaceae
	<i>Pimelea humilis</i>	Low riceflower				Thymelaeaceae
*	<i>Pinus pinaster</i>	Maritime pine				Pinaceae
*	<i>Pinus radiata</i>	Radiata pine				Pinaceae
	<i>Plantago hispidia</i>	Native hairy plantain				Plantaginaceae
	<i>Plantago hispidia</i>	Hairy Plantain				Plantaginaceae
	<i>Plantago lanceolata var.</i>	Ribwort				Plantaginaceae
*	<i>Plantago lanceolata var. lanceolata</i>	Ribwort				Plantaginaceae
	<i>Platylobium obtusangulum</i>	Holly flat-pea				Leguminosae
	<i>Poa clelandii</i>	Matted tussock-grass				Gramineae
	<i>Poranthera microphylla</i>	Small poranthera				Euphorbiaceae
	<i>Prasophyllum fitzgeraldii</i>	Fitzgerald's leek-orchid			EN	Orchidaceae
	<i>Prasophyllum pallidum</i>	Pale leek-orchid	VU	R	EN	Orchidaceae
*	<i>Prunus sp.</i>	Plum				Rosaceae
	<i>Pterostylis nana</i>	Dwarf greenhood				Orchidaceae
	<i>Ptilotus erubescens</i>	Hairy-tail's		R	RA	Amaranthaceae
*	<i>Rosa canina</i>	Dog rose				Rosaceae
*	<i>Rosa rubiginosa</i>	Sweet briar				Rosaceae
*	<i>Rumex sp.</i>	Dock				Polygonaceae
	<i>Rytidosperma geniculatum</i>	Knead wallaby-grass				Gramineae
	<i>Rytidosperma setaceum</i>	Small-flower wallaby-grass				Gramineae
	<i>Rytidosperma sp.</i>	Wallaby-grass				Gramineae
	<i>Scaevola albida</i>	Pale fanflower				Goodeniaceae
	<i>Schoenus apogon</i>	Common bog-rush				Cyperaceae
	<i>Senecio picridioides</i>	Purple-leaf groundsel				Compositae
*	<i>Senecio pterophorus</i>	African Daisy				Compositae
	<i>Senecio quadridentatus</i>	Cotton groundsel				Compositae
*	<i>Solanum nigrum</i>	Black nightshade				Solanaceae
	<i>Solenogyne dominii</i>	Smooth solenogyne			NT	Compositae
*	<i>Sonchus oleraceus</i>	Common Sow-thistle				Compositae
	<i>Spyridium parvifolium</i>	Dusty miller				Rhamnaceae
	<i>Stenanthemum leucophractum</i>	White cryptandra			VU	Rhamnaceae
*	<i>Stenotaphrum secundatum</i>	Buffalo grass				Gramineae

Weed	SPECIES	COMMON NAME	Conservation Status			FAMILY
			AUS	SA	AMLR	
	<i>Stuartina muelleri</i>	Spoon cudweed				Compositae
	<i>Tetradthea pilosa ssp. pilosa</i>	Hairy Pink-bells				Tremandraceae
	<i>Thelymitra juncifolia</i>	Spotted sun-orchid				Orchidaceae
	<i>Thelymitra pauciflora</i>	Slender sun-orchid				Orchidaceae
	<i>Thelymitra sp.</i>	Sun-orchid				Orchidaceae
	<i>Thysanotus patersonii</i>	Twining fringe-lily				Liliaceae
	<i>Tricoryne elatior</i>	Yellow Rush-lily				Liliaceae
*	<i>Trifolium angustifolium</i>	Narrow-leaf clover				Leguminosae
*	<i>Trifolium campestre</i>	Hop Clover				Leguminosae
*	<i>Ulex europaeus</i>	Gorse				Leguminosae
*	<i>Vulpia sp.</i>	Squirrel-tail fescue				Gramineae
	<i>Wahlenbergia sp.</i>	Native bluebell				Campanulaceae
	<i>Wahlenbergia stricta ssp. stricta</i>	Tall bluebell				Campanulaceae
*	<i>Watsonia bulbifera</i>	Watsonia				Iridaceae
	<i>Xanthorrhoea semiplana ssp. semiplana</i>	Yacca				Liliaceae

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EPBC Status Codes: EX = extinct; CR = critically endangered; EN = endangered; VU = vulnerable
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MLR Regional Status Codes: RE = regionally extinct; CR = critically endangered; EN = endangered; VU = vulnerable;
RA = rare; NT = near threatened; LC = least concern; DD = data deficient, NE = Not Evaluated.

APPENDIX 2 FAUNA SPECIES LIST**Birds**

*introduced species

	Species	Common Name	Conservation Status		
			AUS	SA	AMLR
	<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill			NT
	<i>Acanthiza lineata</i>	Striated Thornbill			
	<i>Acanthiza pusilla</i>	Brown Thornbill			
	<i>Acanthiza reguloides</i>	Buff-rumped Thornbill			
	<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill			
	<i>Accipiter fasciatus</i>	Brown Goshawk			
	<i>Anthochaera carunculata</i>	Red Wattlebird			
	<i>Aquila audax</i>	Wedge-tailed Eagle			
	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo			
	<i>Calyptorhynchus funereus</i>	Yellow-tailed Black Cockatoo		V	VU
	<i>Chalcites basalis</i>	Horsfield's Bronze Cuckoo			NT
	<i>Chalcites lucidus</i>	Shining Bronze Cuckoo			
	<i>Chenonetta jubata</i>	Australian Wood Duck			
	<i>Colluricincla harmonica</i>	Grey Shrikethrush			
	<i>Coracina novaehollandia</i>	Black-faced Cuckooshrike			
	<i>Corcorax melanorhamphos whitaea</i>	White-Winged Chough		R	RA
	<i>Cormobates leucophaeus</i>	White-throated Treecreeper			NT
	<i>Corvus mellori</i>	Little Raven			
	<i>Dacelo novaeguineae</i>	Laughing Kookaburra			
	<i>Daphoenositta chrysoptera</i>	Varied Sitella			VU
	<i>Dicaeum hirundinaceum</i>	Mistletoebird			
	<i>Eolophus roseicapilla</i>	Galah			
	<i>Geopelia placida</i>	Peaceful Dove			
	<i>Glossopsitta concinna</i>	Musk Lorikeet			
	<i>Glossopsitta porphyrocephala</i>	Purple-crowned Lorikeet			
	<i>Gymnorhina tibicen</i>	Australian Magpie			
	<i>Lichenostomus chrysops</i>	Yellow-faced Honeyeater			
	<i>Malurus cyaneus leggei</i>	Superb Fairy-wren			
	<i>Melithreptus brevirostris pallidiceps</i>	Brown-headed Honeyeater			NT
	<i>Melithreptus lunatus</i>	White-naped Honeyeater			
	<i>Neochima teporalis</i>	Red-Browed Finch			
	<i>Ninox novaseelandiae</i>	Southern Boobook			
	<i>Pachycephala pectoralis fuliginosa</i>	Golden Whistler			
	<i>Pachycephala rufiventris rufiventris</i>	Rufous Whistler			NT
	<i>Paradalotus striatus</i>	Striated Pardalote			
	<i>Pardalotus punctatus punctatus</i>	Spotted Pardalote			NT
	<i>Petroica boodang boodang</i>	Scarlet Robin			VU
	<i>Phaps chalcoptera</i>	Common Bronzewing			

	Species	Common Name	Conservation Status		
			AUS	SA	AMLR
	<i>Phaps elegans</i>	Brush Bronzewing			RA
	<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater			
	<i>Phylidonyris pyrrhoptera pyrrhoptera</i>	Crescent Honeyeater			
	<i>Platycercus elegans x flaveolus</i>	Adelaide Rosella			
	<i>Rhipidura fuliginosa</i>	Grey Fantail			
	<i>Strepera versicolor</i>	Grey Currawong			
	<i>Todiramphus sanctus santus</i>	Sacred Kingfisher			NT
*	<i>Turdus merula</i>	Common Blackbird			
	<i>Zosterops lateralis</i>	Silvereye			

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Mammals

*introduced species

	Species	Common Name	Conservation Status		
			AUS	SA	AMLR
*	<i>Cervus dama</i>	Fallow deer			
	<i>Chalinolobus gouldii</i>	Gould's wattled bat			
	<i>Macropus fuliginosus</i>	Western grey kangaroo			
	<i>Mormopterus planiceps</i>	Southern freetail bat			
*	<i>Mus musculus</i>	House mouse			
*	<i>Oryctolagus cuniculus</i>	European rabbit			
	<i>Pseudocheirus peregrinus</i>	Common ringtail possum			
	<i>Rattus fuscipes</i>	Bush rat			NT
*	<i>Rattus rattus</i>	Black rat			
	<i>Tachyglossus aculeatus</i>	Short-beaked echidna			NT
	<i>Tadarida australis</i>	White-striped freetail-bat			
	<i>Trichosurus vulpecula</i>	Common brushtail possum		R	RA
	<i>Vespadelus darlingtoni</i>	Large forest bat			
	<i>Vespadelus regulus</i>	Southern forest bat			

Reptiles and Amphibians

Species	Common Name	Conservation Status		
		AUS	SA	AMLR
<i>Christinus marmoratus</i>	Marbled gecko			
<i>Crinia signifera</i>	Common froglet			
<i>Ctenophorus decresii</i>	Tawny dragon			
<i>Hemiergis decresiensis</i>	Three-toed earless skink			
<i>Lampropholis guichenoti</i>	Garden skink			
<i>Lerista bougainvillii</i>	Bougainville's skink			
<i>Pogona barbata</i>	Bearded dragon			
<i>Pseudechis porphyriacus</i>	Red-bellied black snake			
<i>Pseudonaja textilis</i>	Eastern brown snake			
<i>Pseudophryne bibroni</i>	Brown toadlet			
<i>Tiliqua rugosa</i>	Sleepy lizard			

Conservation Status: AUS= *Environment Protection and Biodiversity Conservation Act (EPBC) 1999*,
 SA= Schedules of the *National Parks and Wildlife Act (NPW) 1972*,
 AMLR (Adelaide & Mount Ranges NRM Region) = Gillam, S. and Urban, R. (2014) *Regional Species Conservation Assessment Project, Phase 1 Report: Regional Species Status Assessments, Adelaide and Mount Lofty Ranges NRM Region*. Department of Environment, Water and Natural Resources, South Australia.

EPBC Status Codes: EX = extinct; CR = critically endangered; EN = endangered; VU = vulnerable
 NPW Status Codes: X = extinct, E = endangered; V = vulnerable, R = rare.
 MLR Regional Status Codes: RE = regionally extinct; CR = critically endangered; EN = endangered; VU = vulnerable;
 RA = rare; NT = near threatened; LC = least concern; DD = data deficient, NE = Not Evaluated

APPENDIX 3 LAND TENURE HISTORY

TENURE	LESSEE/OWNER	TERM
Section 23 and Section 919:	John Murray	24/4/1856 - 9/7/1888 10/11/1846 – 9/7/1888
Certificate of Title (CT) 524/116	Alexander B. Murray, John Warren, John Murray (the younger) and Alison Murray	10/7/1888 – 18/12/1890
CT 558/151	Alex J. Murray	19/12/1890 – 16/12/1898
CT 642/41	Selina J. Adlam	17/12/1898 – 16/1/1900
CT 642/41	William Garrett	17/1/1900 – 15/4/13
CT 642/41	Ada. P. Thyer	16/4/13 – 8/3/38
CT 2686/55	August J. Fromm	9/3/38 – 20/7/59
CT 2686/55	Francis W. Dawson-Ryan and Sylvia M. Dawson-Ryan	21/7/59 – 26/9/62
<i>Transfer and merger with Sec. 146</i>	Crown Land	27/9/62
Section 146:		
Miscellaneous Lease (ML) 935	John Murray	1/1/1884 – 2/5/1889
Perpetual Lease (PL) 2393	Edward H. Starkey	30/9/1892 – 24/11/1938
PL 2393	August J. Fromm	25/11/38 – 20/7/59
PL 2393	Francis W. Dawson Ryan and Sylvia M. Dawson-Ryan	21/7/59 – 27/9/62
Section 147:		
ML 935	John Murray	1/1/1884 – 2/5/1889
PL 2394	Daniel J. Jenkins	30/9/1892 – unknown
Section 148:		
ML 9365	John Murray	1/1/1884 – 2/5/1889
PL 2395	Thomas Owens	30/9/1892 – 1906
PL 2395	Bridget Owens	1906 – 16/6/21
ML 8231	Arthur L. Starkey	1/1/26 – 31/3/26
PL 13889	Daniel J. Jenkins	1/4/26 – 26/10/54
PL 13889	Walter J. Jenkins and Victor L. Jenkins	27/10/54 – 30/7/67
PL 13889	Victor L. Jenkins	31/7/67 – 27/11/69
PL 13889	Alan G. McGregor and Skye T. McGregor	28/11/69 – 8/12/70
Section 390:		
Transfer	Crown Land	

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