



GREEN TRIANGLE FOREST MANAGEMENT PLAN

September 2016



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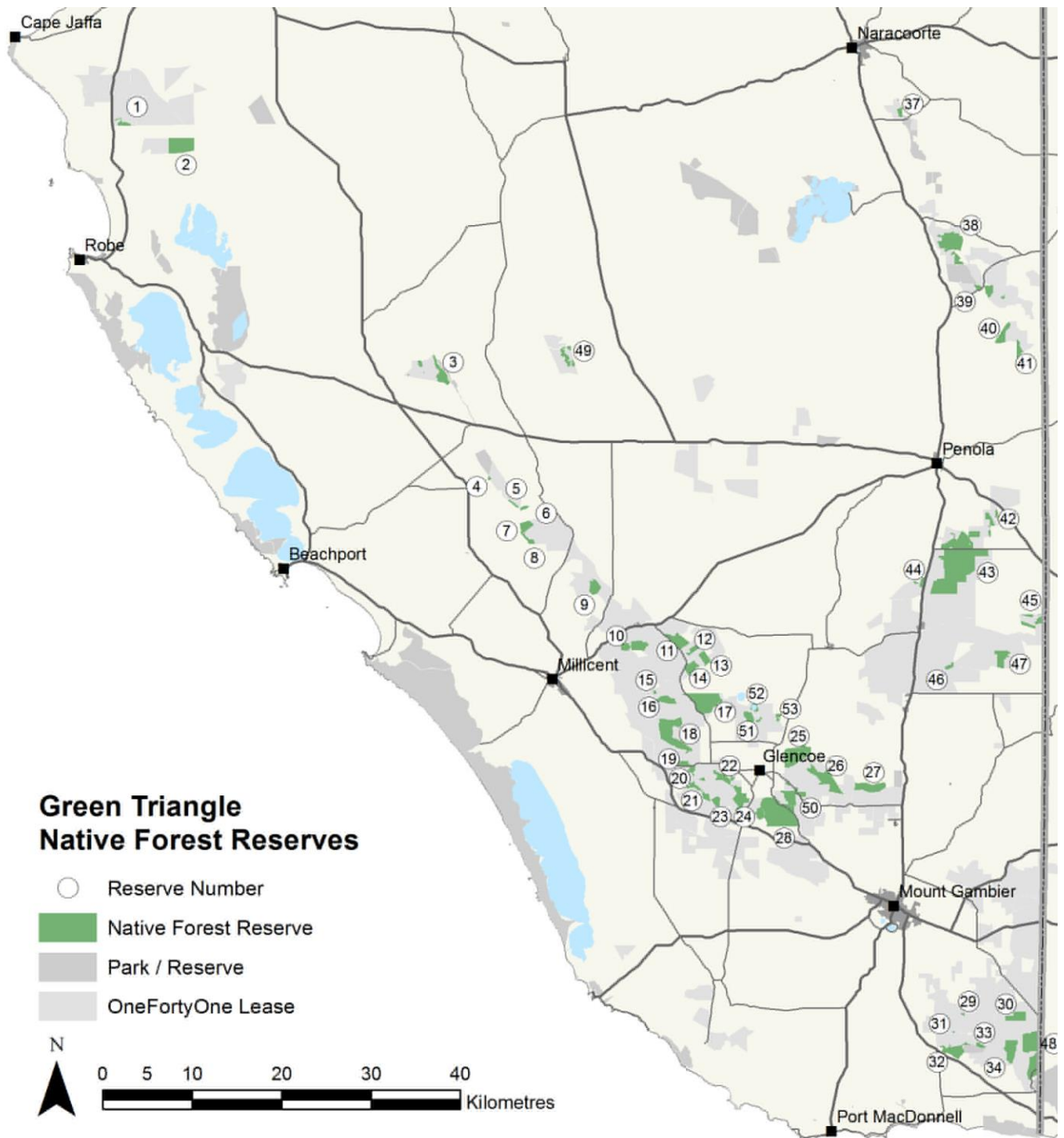
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Green Triangle Forest Management Plan

The Green Triangle Forest will be managed according to this Management Plan, under the framework of ForestrySA's policies, guidelines and Forest Management System. ForestrySA has prepared this plan to set out the purpose and management objectives for the Green Triangle Forest. These management objectives underpin the framework for sustainable forest management. The administrative details contained in this document are current as at date of publication. Implementation of the Plan will occur so that regulatory and other obligations are met and so that programs are delivered in line with budgets and operational constraints.

The management of the Green Triangle Forest is mandated by the Charter of the South Australian Forestry Corporation (SAFC), which details the responsibility for the management of significant Government assets within the context of broader Government policies and strategies. These responsibilities include issues relating to commercial plantations, biodiversity conservation and heritage protection, community engagement and regional development.



No.	NFR Name	Area (ha)	No.	NFR Name	Area (ha)	No.	NFR Name	Area (ha)
1	Mount Benson	66.2	18	Native Wells	619.5	37	Cave Range	45.3
2	Bagdad	453.6	19	Glencoe Hill	66.6	38	Deadmans Swamp	533.2
3	Konetta	241.6	20	Mount Watch	49.9	39	Wombat Flat	151.1
4	Gillap North	12.9	21	Windy Hill	139.6	40	Comaum	157
5	Gillap South	25.1	22	Long	147.1	41	Boolara	84
6	Kennion	30.7	23	The Bluff	73.1	42	Round Waterhole	118.4
7	Rocky Reserve	131.8	24	The Woolwash	263.6	43	Nangwarry	2214.8
8	White Waterhole	60.2	25	Hacket Hill	493.1	44	Muddy Flat	64
9	Malone Heath	156.3	26	Wandilo	427.4	45	Topperwein	174.8
10	Kay	249.9	27	Grundy Lane	287.8	46	Island Swamp	42.6
11	Whennen	244.4	28	Honan	1026.8	47	The Heath	203.7
12	Mount McIntyre	63.1	29	Laslett	9.5	48	Dry Creek	745.8
13	McRosties	111.2	30	Snow Gum	191.8	49	Khayyam	214.7
14	Overland Track	144.1	31	Hells Hole	4.1	50	Kangaroo Flat	302.8
15	Rock Shelter	12.4	32	Warreanga	250	51	Mt Lyon	117.4
16	Burr Slopes South	135.5	33	Pond Flat	32.8	52	Lake Edward	58.1
17	The Marshes	596.5	34	Honeysuckle	266.4	53	The Claypans	35.1

Figure 1 – Native Forest Reserves of the Green Triangle

1. Introduction

ForestrySA manages just under 12700 hectares of land in the Green Triangle, nearly all of which is contained within 51 Native Forest Reserves. These reserves are located in the lower south east of South Australia (Figure 1). The majority of the reserves are located within close proximity to Penola, Millicent, and Mount Gambier, with smaller outlying areas occurring near Robe. These reserves are managed for conservation and provide passive recreational opportunities such as bushwalking and cycling and contain a range of facilities. ForestrySA has responsibilities for providing fire protection and maintains a series of smaller parcels of land containing fire towers, depots, and minor areas of plantation. ForestrySA is also responsible for the provision of recreational sites and access permits both within its estate and on crown land held under lease by OneFortyOne Plantations Pty Ltd.

The plan describes the management context and planning framework for the forest, and provides a summary of the natural, built and heritage values, community use and issues that impact on the management of the forest. It addresses the main land uses including conservation, recreation, historical and heritage aspects of the forest. A summary of the values and issues in the forest is included for external audiences. Additional strategic and operational plans provide more detailed direction for specific aspects of management.

ForestrySA's main objectives are to:

- Conserve and enhance biodiversity and areas of conservation, cultural, historic and scientific significance in native forest reserves.
- Encourage cooperation with the community and other stakeholders and promote the community use of the Forest for a range of recreational activities, community events and educational values.

Management objectives stated in this plan underpin the framework for management of the forest, while **Management actions** set priorities for the values identified.

Native Forest Management Context

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 are managed as Reserves under the Forestry Act 1950 by ForestrySA (formerly the Woods and Forests Department) which was established in 1882.

ForestrySA's primary management objective for areas of native vegetation 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 vegetation, ForestrySA:

- recognises that the size and relative isolation of much native vegetation increases the risk of species loss due to fire, drought or disease.
- recognises that Native Forest Reserves contribute to the conservation of valuable remnant habitats for many species and provide, in part, a representation of the original vegetation.
- recognises that 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 between and within Native Forest Reserves as required to maximise biodiversity; and
- may co-operate with neighbouring landowners (Other Government agencies, Local Government, private individuals) 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. ForestrySA is committed to the following broad management objectives for the native vegetation under its control, for the benefit of the people of South Australia:

- Conservation Management – the reserves will be managed for the long-term conservation of native plant and animal communities, and will incorporate research and monitoring. Options for species re-introduction programs will be evaluated. Natural processes will be maintained by the use of approved prescribed burning and/or other activities when and where appropriate.
- Community Use – community use will be managed consistent with the NFR’s primary conservation purpose. Understanding and awareness of the NFR’s natural values will be promoted in line with ForestrySA policies and guidelines.
- Protection – the NFRs will be managed to minimise impacts from human-induced or natural disturbances and in recognition of the potential hazards and risks they present to adjacent land use and the community.
- Rehabilitation – sites that have been extensively degraded by human-induced or natural activity will be rehabilitated.
- Stakeholder Involvement – community groups and volunteers (Friends of the Forest) will be encouraged to participate in the implementation of the management program.

State and Regional Framework / Context

The management goals for the Green Triangle complement existing South Australian State and regional plans, including those relating to the management of native vegetation, bushfire mitigation, natural resources, biodiversity, conservation, cultural heritage, recreation and tourism. These plans include but are not limited to:

- In a Great State, SA Strategic Plan (2011)
- Our Place. Our Future, State Natural Resources Management Plan, South Australia (2012-2017)
- South Australian Tourism Plan 2020
- No Species Loss – Nature Conservation Strategy for South Australia (2007-2017)

At a regional level, biodiversity conservation priorities are guided by:

- South East Natural Resources Management Plan (2010)
- Biodiversity Plan for the South-East of South Australia (Croft et al 1999)
- Biological Survey of the South East South Australia (Foulkes and Heard 2003)
- Regional Species Conservation Assessment Report (Gillam and Urban 2001)
- Limestone Coast Regional Plan, August 2011
- Lower Limestone Coast Water Allocation Plan

Administrative and Legislative Context

ForestrySA is governed through the Charter of the South Australian Forestry Corporation. The Corporate Overview outlines the Corporation's mission, roles and values. Further information about the Corporate Overview and Charter can be found online at <https://www.forestrysa.com.au/About-Us/CorporateOverviewandCharter>.

ForestrySA works within the objectives of the Strategic Plan (2015-20). The implementation of this plan facilitates a number of strategies that have been identified. ForestrySA is committed to achieving high standards of management through the Forest Management System (FMS), an integrated system relating to quality, environment, and sustainable forestry practices. ForestrySA also maintains certification to the Australian Forestry Standard (AS 4708).

On ground management and decisions are guided by both Commonwealth and State legislation, including the *Forestry Act 1950* and *Forestry Regulations 2005*, *National Parks and Wildlife Act 1972*, *Environment Protection and Biodiversity Conservation Act 1999* (AUS), *Native Vegetation Act 1991*, *Aboriginal Heritage Act 1988* and the *Natural Resources Management Act 2004*. Further legislation is referenced in Appendix 3.

ForestrySA has obligations regarding recreational access and joint management areas on crown land leased by OneFortyOne Plantations Pty Ltd (OneFortyOne Plantations / OFO) as detailed in the Plantation Lease Agreement and Operations Deed. Further details are provided in Chapter 10 and relevant sections.

ForestrySA manages land within the District Council of Grant, City of Mount Gambier, Naracoorte Lucindale Council, Kingston District Council, District Council of Robe, and Wattle Range Council. ForestrySA works within council planning guidelines when undertaking forest operations.

Planning and management of programs are undertaken by supervision of ForestrySA staff. A variety of means are used to achieve outcomes including the use of both internal and external resources and volunteers. Plans and strategies range from strategic long-term (5 – 25 years), medium term (1-5 years) and short term (annual).

Operational plans are developed for forest activities in line with longer term goals to provide good biodiversity outcomes and ensure value for money. A variety of internal and external funding sources are used to achieve these goals. The majority of funding comes from the South Australian Government, through PIRSA Forestry for the provision of Community Service Obligations (CSO's). These include native forest management, community use of forest reserves, forest industry development and community and fire protection. Other funding is sourced through Commonwealth and State Government initiatives to enhance core programs.

ForestrySA coordinates a community engagement program that assists with the management of native vegetation, community facilities and heritage sites. Larger teams are engaged through a variety of youth development, community service and environmental training programs.

2. History

The Green Triangle has a long history, with four main periods covered in this plan. They can be best summarised as:

1. Aboriginal Australia – Where traditional life and occupation of the region occurred according to its own unique culture, government, and system of beliefs. Aboriginal people were largely unaffected by colonisation in this region until the 1840s.
2. Early Pastoral – A period where large pastoral leases occupied the region. This occurred from the 1840's until a period of closer settlement from the 1870s to the early 1900s. Major towns, ports and roads were established during this period and Aboriginal society experience its greatest decline.
3. Closer Settlement – A period where closer settlement began from the 1870s through to the 1930s when the land was purchased for forestry purposes.
4. Woods and Forests Legacy – Purchase and management by the Woods and Forests Department (Now ForestrySA).

Aboriginal groups traditionally occupying the plan area included the Boandik, or Bunganditj, the Meintangk, and the Pinejunga. The early pastoral period commenced soon after the state was founded in 1836 during the early 1940s, with pastoralists driving their stock overland and forming a series of large stations. These were comprised of a head station and series of smaller outstations scattered over their leases. Towns and infrastructure developed in line with the pastoral industry. Closer settlement meant a greater density of people arriving on a larger number of sections. Some of this land was poorer land, and tenants made efforts during this period to further improve the land for agriculture and grazing by clearing and draining. The Woods and Forest Department later purchased the land to utilise it for forestry purposes.

Forest History

Due to concerns about the state's limited native forest and over-exploitation of the resource, the South Australian Government began undertaking forestry in 1875. A forest board was established and given responsibility for protecting and regenerating native vegetation and research into forestry. It soon became evident that large areas needed to be planted to maintain the domestic timber supply, so nurseries and trial plantings began in 1876 at Wirrabara and Mount Gambier. The Woods and Forests Department was established in 1882, and by 1900, two species of Pine were chosen for plantations, and large scale plantings began.

Some of the Native Forest Reserves, including Kay, Rock Shelter, Burr Slopes South, Native Wells and Nangwarry have their tenure linked to these very early days of forestry; however the majority of the reserves were acquired in the 1920s and 1930s during a period of larger scale expansion. Over coming decades, further land acquisition coupled with a series of government employment and other programs, new technology, plantation suitability surveys, and changes in forest policy, native vegetation was both cleared and set aside into the reserved areas we manage today.

Conservation Planning and Management

In the early 1970s there was a major shift in the Department of Woods and Forests policy towards the retention and more considered conservation management of native vegetation. Initial policies relating to prescribed burning were developed during this time, and several studies on flora and fauna were undertaken.

The development of the Native Vegetation Act in the early 1990s meant staff with skills in native vegetation planning and management were needed and the first dedicated Scientific Officer in the

Green Triangle was appointed at this time. The Community Forestry Section was established in the mid 1990's to further develop expertise in this area and this section was renamed Conservation and Recreation in the mid 2000's. With the support of management a number of conservation planning officers and rangers have been employed since the mid – late 1990's to plan and implement a range of conservation, community engagement and recreation programs and projects including the development of native forest reserve management plans, large scale revegetation programs, the successful strategy to establish biodiversity corridors and the school education program. The achievements by staff involved in conservation, community engagement and recreational planning and management during this period are acknowledged and have been a significant factor in allowing ForestrySA to meet its Community Service Obligations and objectives under the Australian Forestry Standard.

Management Actions

- Continue to staff and manage the region with appropriate resources to meet Community Service Obligations and objectives under the Australian Forestry Standard.

3. Landscapes and Water

The region has a Mediterranean climate with warm dry summers and cool wet winters. Rainfall is highest in the southern areas with average rainfall up to 850 millimetres around the Mount Burr Range and Mount Lyon, and in parts of Caroline Forest. A steady decrease northward and inland results in average rainfall as low as 600 millimetres in Comaum and Cave Range, and 650 millimetres around Mount Benson.

The lower South East of South Australia is comprised of many landforms that have originated from a unique geological history. The region is typified by a series of stranded dune ranges - the remains of old shore lines which run parallel to the present day coast. Interdunal and lower lying areas contain wetlands of various types. These systems are found above limestone or karst, which contains the region's water resource in the form of aquifers, and in which many caves and sinkholes have formed. Very few significant surface streams exist within the region because of this karst system. A more recent volcanic influence and wind-blown sand dunes add complexity to the geology.

Soils and unique habitats have developed, depending on the position in the landscape, availability of water and nutrients, drainage, and history of the site. Because of the forestry history of the sites, the majority of reserves are located on or alongside the more elevated and better drained soils of sand dune or volcanic origin. In the lower lying areas, a mixture of both terrestrial and aquatic habitats can be found scattered through the landscape, adding to the diversity of species found there.

Different karst systems are found throughout the region. The larger cave systems have had a strong relationship with water in their formation. Caves and sinkholes are common throughout the Mount Burr Range, Mount Gambier Forest and Caroline Forest and along the Naracoorte Range. These can range from simple dolines and solution tubes, to more complex cave systems such as Snake Hill and sinkholes such as Hells Hole. South of Mount Gambier and The Bluff, wet caves are common in the more extensive Mount Gambier Limestone formation, and are used by cave divers. Caves are less common in the lower lying areas around the Dismal Swamp and Penola Forest, as they are filled with soil. This has led to the development of many wetlands; many over the top of underground sinkholes (uvalas) with an adjacent "runaway hole" (funnel doline). A good example of one of these is at Topperwein NFR, where the main wetland overflows into a runaway hole via a small creek. ForestrySA are responsible for management of caves in NFRs, and manage recreational access to sites in the broader forest via the forest permit system (see Section 6 Community Use)

The majority of wetlands with better hydrology found throughout the forest contain simple perched aquifers. This means they have a confining ground layer of clay, organic hardpan, or peat holding the water in the wetland. These types of wetlands are the least affected by large scale drainage, intensive agriculture, and forestry due to their consistent hydrology. Variations of these wetlands have developed on the volcanic hills around Mount McIntyre and Mount Lyon and the edges of the Mount Burr Range. Larger scale wetland systems can be found at The Marshes, Honan, and Kangaroo Flat NFRs over perched aquifers. Many wetlands including the aforementioned overflow when full, and follow natural drainage lines to other wetlands or runaway holes further down the gradient. Wetlands with altered hydrology generally have greater groundwater influences, and are typically found on the edges of highly modified landscapes.

Most of these wetlands and are further described in the vegetation section and in the Wetland Condition Field Guide (Horn & Haywood 2016) and Wetlands Great and Small (Herpich and Butcher 2010). Landscapes and Water are being compiled into a Green Triangle NFR Resource Document (Horn in prep.)

Management Actions

- Continue to manage and protect caves and sinkholes for conservation purposes and ensure adequate protection at each site.
- Maintain public safety through restricted access to karst features
- Uphold conservation values by altering access to karst features as necessary
- Continue to allow scientific and research activities relating to Landscapes and Water.

4. Biodiversity Conservation

ForestrySA manages biodiversity across its estate through a number of formal and informal mechanisms. At the highest level, biodiversity is formally protected in South Australia in Native Forest Reserves (NFRs). Other more informally reserved areas are protected as conservation zones and features and managed through the forest management system.

Flora

ForestrySA manages approximately 12 700 hectares of native forest, woodland, and wetland in the lower South East, most of which is contained within Native Forest Reserves (NFR). The native vegetation within the NFRs contribute significantly to biodiversity conservation within the lower South East region, where less than 6% of the original native vegetation remains (Foulkes and Heard 2003). NFRs are gazetted under the Forestry Act 1950 and have a similar protection status as National Parks.

The NFRs are some of the best examples of native vegetation in the region as they have remained largely undisturbed by grazing and pasture establishment practices, although some areas have a history of wood cutting and vegetable growing or other agricultural crops. The relative size of the NFRs and their relatively undisturbed histories make them significant areas for biodiversity conservation. NFRs add significant value to existing conservation parks of the area. The region's Native Forest Reserves contain a wealth of floral diversity, including a large number of regionally, state, and nationally threatened species (refer to Threatened Species section).



Swamp Gum Woodland, Honan NFR.

There are well documented fire histories dating back to the 1950s for many NFRs, making them ideal reference areas in biodiversity management. Monitoring is a key component of effectively managing remnant vegetation. ForestrySA have set up programs to regularly capture flora and fauna population and distribution data since the mid-1970s, with Nangwarry NFR targeted for flora and

fauna response to prescribed burning. More recently, since the late 1990s, specific habitats which are least represented in the region (often because they are highly favoured for agriculture) have been surveyed and documented along with the fauna which they support. Without this information and monitoring system, reporting on significant populations and distribution of species throughout the native forest reserve network would not be possible.

The majority of the Native Forest Reserves in the region consist of Brown Stringybark woodland and forest, which occurs on the more elevated sites. This woodland is scattered across the landscape, forming associations with a variety of different vegetation types ranging from wetlands and swampy woodland types in the lower lying areas, to Messmate and Manna Gum on the more fertile soils of the ranges. The understorey is variable, ranging from a typical heath or bracken rich woodland through to areas that are rich in herbs and sedges. These key vegetation types provide habitat and protection for numerous species that depend on them.

Throughout the Green Triangle region, a range of different habitats are protected within the NFRs. The reserves to the south-east of Mount Gambier contain flora and fauna species on the edge of their national distributions, abutting large remnants of native vegetation in Victoria. For example, the largest protected population of Snow Gum (*Eucalyptus pauciflora*) in South Australia exists within Snow Gum NFR, with the species also found at three other nearby NFRs.

Biological surveys have recorded more than 950 species of native plants, including eleven nationally threatened species, and 210 species with State conservation significance. A number of species are known to occur nowhere else, for example Honan Mint (*Mentha atrolilacina*) named after the NFR in which it was first found. Another notable species is the Spiral Sun-orchid (*Thelymitra matthewsii*), the largest known population of which occurs at Nangwarry NFR.

Honan NFR is in fact one of the most floristically diverse reserves in the state, containing the highest number of threatened species of all South Australian reserves, with 140 of the 160 state significant threatened species in the region found here.

Native grasslands and grassy woodland ecosystems are some of the most endangered ecosystems in south-eastern Australia (Greening Australia 2006) and significant areas of both are present within the NFRs. Some of the best examples of Swamp Gum grassy woodland in the region can be found in Honan and Kangaroo Flat NFRs, while Dry Creek NFR contains a degraded native grassland.

A number of priority vegetation associations are found within Green Triangle NFRs (see Appendix 1).

Fauna

The high level of floral diversity supports a similarly high level of wildlife diversity within the NFRs. The plantation mosaic, with inliers of native vegetation creates important linkages between habitats, particularly for forest and woodland bird species. Over 100 bird species have been recorded, including 21 species of high conservation significance in South Australia including the Powerful Owl (*Ninox strenua*), Red-tailed Black Cockatoo (*Calyptorhynchus banksii* ssp. *graptogyne*), Satin Flycatcher (*Myiagra cyanoleuca*), Chestnut-rumped Heath-wren (*Calamanthus pyrrhopygius*) and Southern Emu-wren (*Stipiturus malchurus*). The species detected occupy a diverse range of foraging niches which reflects the habitat diversity of the NFRs.

More than 25 species of reptiles and amphibians have been recorded, including the Growling Grass Frog (*Litoria raniformis*) which is rated Vulnerable at both state and national level. This frog species requires semi-permanent waterbodies preferably with a good cover of Ribbon Weed (*Triglochin*

procura) The Glossy Grass Skink (*Pseudemoia rawlinsonii*) and Swamp Skink (*Egernia coventryi*), both Endangered in South Australia are found in Honan NFR, preferring dense wet heath sites.

The Southern Brown Bandicoot (*Isodon obesulus*) is a mammal species of high conservation significance, with 90% of the south east population occurring in native forest reserves. The dominant habitat for this species is the Brown Stringybark (*Eucalyptus baxteri/arenacea*) woodlands where a good cover of heath and/or *Xanthorrhoea* Grass-trees occur. Other significant species include Heath Mouse, and Yellow-bellied Glider which would not occur in South Australia if it was not for NFRs. Populations of Sugar Glider, Red-necked Wallaby, and Swamp Wallaby are also well represented in NFRs.

Despite timber cutting in native forest areas, larger scattered trees remain, which are critical habitat for hollow dependent fauna such as gliders and owls.

Threatened Species

Threatened species, communities, and habitats are managed in accordance with threatened species legislation which provides protection measures for areas with threatened species, communities, and/or habitats present (see Appendix 1 for full list of threatened species, communities, and habitats known to occur within NFRs).

Safeguards are in place to ensure threatened species, communities, and habitats are identified, assessed, monitored, and their status improved through the Forestry Management System. Threatened flora and fauna species are discussed under the relevant sections above (see also Appendix 1 for a full list of threatened species).

Specific examples of conservation action and survey include:

- Revegetation to improve populations of *Mentha atrolilacina*, *M. diemenica*, *Olearia glandulosa*, *O. suffruticosa*, *Leptostigma reptans*, *Veronica subtilis*, *Pultenaea dentata*, *Lomandra filiformis* ssp. *coriacea*, *Lagenophora gracilis*, *Eryngium vesiculosum*, *Cullen microcephalum*, *Eucalyptus pauciflora*, and *Acacia stricta*;
- Surveys (documenting) of populations/sites for *Cardamine gunnii*, *Dianella callicarpa*, Powerful Owl, Yellow-bellied Glider, Heath Mouse, Southern Brown Bandicoot, Eared Worm-lizard, Growling Grass-frog, Smooth Frog, McCoys Skink, Brolga, Ancient Greenling damselfly, and Sword-grass Brown, Splendid Ochre, and Orange Ochre butterflies.

The Heath Mouse (*Pseudomus shortridgei*) is listed as Vulnerable under the Environment Protection and Biodiversity Conservation Act 1999, and Endangered in South Australia under the National Parks and Wildlife Act 1972. There are two distinct populations in Australia, one in Western Australia, and the one in south-eastern Australia in the Victoria/South Australia border region. The species inhabits dry heathland habitat, and was discovered to be present in the NFRs of Caroline Forest in 2004. Results from Heath Mouse surveys in recent years indicate that the species persists in the area, including after prescribed burning.

The Eared Worm Lizard (*Aprasia aurita*) is an Endangered legless lizard. The species was originally thought to only occur in the Victorian mallee, but a new population was identified in Malone Heath NFR in 2011. Annual surveys coordinated by Nature Glenelg Trust have taken place each spring using grids of roofing tiles under which the reptiles can be found.



Powerful Owl, Comaum, T. Wynniat.



Southern Brown Bandicoot, B Haywood.

Red-tailed Black Cockatoo is nationally and state listed as Endangered. The highly specialised feeder relies solely on three species of tree to support its lifecycle: Brown Stringybark, Desert Stringybark, and Buloke. Extensive areas of stringybark woodland are contained within the NFRs and Red-tailed Black Cockatoo sightings are common. The Red-tailed Black Cockatoo Recovery Team have held an annual population count in May every year since 1996; this is one of the major public events which occur within the NFRs.

The distribution of the Southern Brown Bandicoot stretches across south-eastern Australia, with 95% of all records in the South East occurring within NFRs. Extensive population surveys involving >300 sites have been carried out in the South East in 1998, 2007-08, and 2016, revealing that the population in the Mt Burr Range has remained reasonably constant throughout this time however smaller populations in Nangwarry and Caroline Forests are declining (Fullagar, 2016).

Powerful Owl (*N. strenua*) is a tall forest owl occurring throughout eastern Australia and was first report in South Australia in the 1960s. At this time, the species was thought to only be a vagrant, with no breeding pairs known. Powerful Owls require large hollows for nesting and have a characteristic dusk mating call which is often used to accurately identify its presence in remnant patches. In 2006-07, two breeding pairs were discovered in Dry Creek and Wombat Flat NFRs (Haywood, 2010) where they still occur today.

A population of Yellow-bellied glider (*Petaurus australis*) were discovered in Caroline Forest around the late 1970s. Characteristic markings were found on gum trees in Snow Gum NFR. Yellow-bellied Gliders make a dusk territorial call which can be heard at several hundred metres allowing accurate

identification of their presence. The small population was monitored by researchers from Adelaide University in the 1990s however despite several attempts no gliders have been seen or heard since 2009.

The Smooth Frog (*Geocrinia laevis*) is a state listed amphibian only known from the SE region of South Australia. Smooth Frogs inhabit damp forests and shallow wetlands and formed the focus of a study in the 1960s, 1999-2000 and 2011-2013. The majority of the population occur in NFRs and adjacent plantation wetlands (Haywood, 2013) throughout the Mt Burr Range and Mt Gambier Forest where they are considered secure.

Monitoring

The network of NFRs, conservations areas, and other inliers, allow for a diversity of structural elements and processes, as well as ensuring genetic, species, and structural diversity are all maintained across the landscape. ForestrySA has a program of biodiversity monitoring across the estate. Methods employed include vegetation plots, flora and fauna ramble surveys, photopoints, targeted flora and fauna surveys, weed monitoring, native vegetation condition reports, and wetland condition reports. This comprehensive program, including the development and maintenance of databases, allows ForestrySA to assess the effectiveness of the biodiversity objectives, to assess threat levels and forest health, and to develop alternate management options accordingly.



Vegetation Monitoring – Nangwarry NFR, Scientific Expedition Group.



Bird Monitoring – Woolwash to Bluff Corridor, White-eared Honeyeater.

External Firebreaks

A significant proportion of firebreaks surround ForestrySA's Native Forest Reserves that are either owned, leased or managed by external organisations with the surveyed boundary often ending at the tree-line. Many of these firebreaks make a significant biodiversity contribution to the native vegetation as they contain threatened and less common orchid and other plant species. Although managed by external parties, ForestrySA has an interest in working with these organisations to ensure the long-term survival of species growing on these firebreaks.

A variety of operations occur adjacent to these firebreaks depending on the business of the land manager, but may include roading, harvesting, transportation, site preparation, maintenance, weed and pest control, and fire. The significant risks associated with many of these activities can be minimised if they are undertaken with best practice, ensuring operations are compatible with high biodiversity firebreaks and other native vegetation. In some cases, the conservation significance of a

firebreak may necessitate the installation of extensive site signage, and/or the establishment of exclusion zones during a potentially high impact operation.

Management Actions

- Work with other agencies as necessary towards improving the status of threatened species, communities, and habitats.
- Continue existing monitoring programs and/or establish new monitoring as necessary.
- Maintain biodiversity databases (weeds, flora, and fauna).
- Maintain the program for collection and storage of biological data using a variety of professional, community program, and volunteer sources. Provide this data to DEWNR on a periodic basis.
- Update relevant NFR resource information as required.
- Complete the Green Triangle NFRs Resource Book.
- Maintain links with other natural resource management programs to further develop communication on conservation issues and priorities and to provide opportunities to further develop integrated regional conservation programs and to access funds for on-ground works.
- Continue to foster relationships with adjoining landholders to encourage integrated conservation management.
- Continue active encouragement of participants and volunteers through Community Engagement programs to increase involvement in biodiversity conservation activities.
- Develop good working relationships with neighbours to ensure that firebreaks around NFRs are used and managed appropriately.
- Encourage neighbouring land managers to undertake a thorough environmental assessment survey prior to their considered use of high impact activities around NFRs (including but not limited to pest plant control, roading, grading, heavy machinery use and transport routes).
- Work with neighbouring land managers to promote appropriate buffers and setbacks adjacent to NFRs.
- Work with neighbouring land managers to ensure appropriate and legal management of native vegetation encroaching on external firebreaks.

5. Weeds and Pests

Weeds in native vegetation affect biodiversity values by displacing and competing with native plant species and altering the structure of the vegetation community. Similarly, introduced pest animal species such as rabbits, foxes, and cats compete with native fauna for resources and/or are predatory towards native animal populations.

Weeds

A number of introduced species have become weeds in NFRs, and of particular concern are pine wildings, blackberry, boneseed, and bridal creeper (both common and Western Cape varieties). Minimising the transfer of weeds from neighbouring landuses to conservation areas is critical in protecting the value of the natural habitat. The native coastal and sallow wattles are also an issue in many NFRs. Dispersal of weed species takes place via a variety of vectors, including animals, wind, and human activities (recreational use, or machinery, etc). Minimising the transfer of weeds from between plantation and conservation areas is critical in protecting biodiversity values.

Weeds are managed using an integrated approach across the whole forest estate, and in some instances in conjunction with neighbouring land managers. Many weed infestations require attention over a number of years in order to achieve either full control or containment. Weed management is an ongoing, and adaptive undertaking. ForestrySA staff, contract labour and bushcare volunteers utilise the latest research results to target specific weed species with fire, mechanical, biological, and chemical control options designed to minimise the environmental footprint. Manual/mechanical removal, chemical treatment, and hygiene prescriptions are the main techniques employed in weed control.

In addition to weed species, fungal disease is a threat to native forest. *Phytophthora cinnamomi* is a soil-borne water mould that is dispersed by water and other vectors, such as animals, vehicles, and bushwalkers. While the mould has been identified as one of Australia's key threatening processes, the Green Triangle region has been deemed to be very low risk due to non-conductive soil types (Government of SA 2006). General hygiene management of equipment, especially earthworks machinery, is critical, especially where machinery moves between regions.

ForestrySA uses a weeds database as a planning tool to manage weeds. In 2008, ForestrySA received Caring for our Country program funds aimed at addressing Weeds of National Significance in high priority reserves and threatened habitats. Mapping of all weeds in these areas was undertaken with treatment actions (cut and swab and/or spot spraying) concentrated at Swamp Gum woodland sites containing threatened flora. Buffering weed control was also initiated in adjacent pine plantations for Bridal Creeper and Boneseed. All field data was entered into the weeds database which was especially developed for this project and continues to be in operation today. The database captures weed species, area, infestation level, control method used, contractor, and date of works, and also prompts when follow up control events should occur.

Carefully planned and executed weed control over several years at Hacket Hill and Wandillo NFRs has resulted in a near eradication of blackberry at these sites. The initial stage of the program involved mapping to determine the full extent of the weed infestation, and to assist in determining the best plan of action. Skilled contractors then undertook spraying, with follow up treatment occurring over the following years. This careful and thorough approach has resulted in the removal of a serious threat to the conservation values at these sites of high biodiversity.

Pests

Introduced pest animals recorded within the NFRs include Red Fox, Cat, Rabbit, Fallow Deer, and House Mouse. Pest management focusses on the key threatening processes, as listed under the Environmental Protection and Biodiversity Conservation Act 1999, of competition and land degradation by rabbits, and predation by foxes.

Management of each pest is carried out as necessary. Biological and chemical controls, shooting, and trapping are techniques used to control pest species within the native forests. In NFRs of high conservation significance, fox baiting occurs at regular intervals.

Joint Management Areas

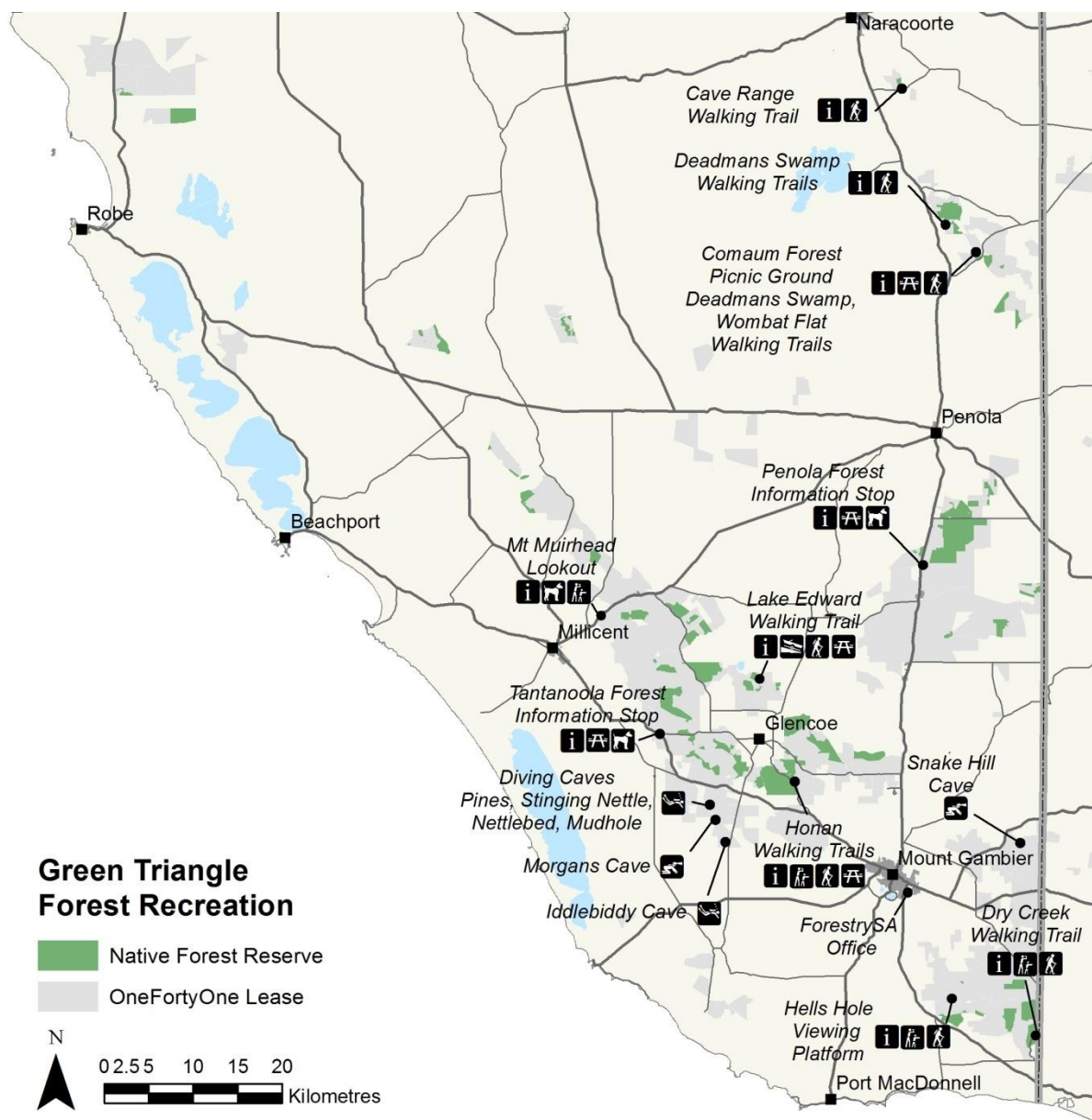
Weeds and pests occurring within the ForestrySA / OneFortyOne Plantations Joint Management Areas are addressed through the ForestrySA / OneFortyOne Plantations Pest Management Strategy. This strategy outlines the protocol for working together to combat weeds and pests of strategic importance to each agency.

Management Actions

- Continue to implement a flexible science based weed and pest control program
- Maintain (and update regularly) the corporate weeds database and Weed Strategy
- Ensure staff and contactors are able to carry out weed and pest control in an environmentally sensitive manner
- Prioritise weed and pest control sites to maximise environmental benefit
- Continue to implement the ForestrySA/OneFortyOne Plantations Pest Management Strategy, developed jointly between the parties.

6. Community Use and Infrastructure

The forest is visited by a diverse range of individuals and groups for a wide variety of activities. Passive recreation activities such as bushwalking, nature observation, bird watching and low-impact cycling are welcome and permitted on established tracks throughout the Native Forest Reserves. All forest areas are open to the public during daylight hours; however pets, the use of vehicles and horse riding are restricted to plantation areas only.



A range of facilities are provided, including interpretive walks, picnic grounds, and visitor information and rest stops. Marked walking trails with interpretation are found at Dry Creek, Hells Hole, Lake Edward, Honan, Wombat Flat, Deadmans Swamp, and Cave Range, all within a natural setting.

Several recreational activities require a permit, including horse riding, caving, and boating. Permits are also made available for groups with a special or scientific interest in Native Forest Reserves. Permits are available through the ForestrySA website where a full list of information on permitted

activities and associated fees can be found (<https://www.forestrysa.com.au/Recreation/Green-Triangle>). Caving permits are available to members of caving groups with relevant experience at Morgans and Snake Hill Caves. Cave diving is permitted in a number of caves, with permits available to members through the Cave Divers Association of Australia website <http://www.cavedivers.com.au>.

An event application can be lodged via the website for larger events including motor rallies, community events, military exercises, orienteering, rogaining and restricted caving activities.

Community use of the forest may be restricted temporarily whilst forest operations are underway, extreme weather such as on fire bans, or for conservation reasons. Snake Hill cave is closed during the wintering period of the critically endangered Southern Bent-wing Bat.

Management Actions

- Manage the forest for recreation and maintain facilities to appropriate standard.
- Implement a regular servicing and maintenance program for recreational facilities, trails, structures, signs, and sites.
- Periodical reviews will be undertaken for trail upgrades, closures, re-routes, developments or extensions that will be undertaken in line with ForestrySA policies and guidelines.
- Any purpose built tracks or trails will be established and maintained to relevant Standards (such as AS2156-1-2001).
- Erect appropriate signage in line with the ForestrySA sign manual.
- Access for horse riders to forest trails (excluding NFRs) will continue to be made available.
- Encourage input from the Limestone Coast Tourism Committee and the Limestone Coast Regional Development Board, State and Local Government agencies and peak user group organisations, regarding future recreational trail and tourism development opportunities.
- Continue to support appropriate community events in the Green Triangle.
- Proposals for commercial activities will be considered in line with ForestrySA policies and guidelines.
- Provide guidelines for recreation access and permits for approved activities on ForestrySA land and on crown land leased by OneFortyOne Plantations via the ForestrySA website.
- Provide recreation areas throughout the OneFortyOne Plantations lease, and undertake periodic review of sites. Provide written notification to OneFortyOne Plantations of recreational permits issued on their lease as they are issued.
- Enforce the Forestry Act and Regulations to ensure compliance.



Recreational Bike Riding



Cave Diving – Iddlebidy Cave, Richard Harris

Community Environmental Programs

The Friends of the Forest Community Engagement Program has allowed individuals or community groups to become involved in a variety of volunteer activities ranging from the collection of natural resource information to implementation of on ground works. Native forest, recreation, and heritage management activities are assisted by youth development, community service, and environmental training programs.

The ForestrySA Schools Program has facilitated the involvement of three local schools and hundreds of students since 2007. Nurseries have been established on school grounds at Newbery Park Primary, Glenburnie Primary, and Millicent High Schools to provide seedlings for revegetation works. Students are also involved in planting and weed control during corridor establishment. Activities are linked to the school curriculum enabling them to be part of the regular school program. University and TAFE groups have undertaken many biological surveys in the region.

Management Actions

- Continue to support community engagement and seek to develop opportunities for participation in community programs and volunteers.
- Adjoining public land managers, other neighbours, NGOs and community groups will be actively engaged to develop and implement coordinated management programs.



ForestrySA Schools Program, Glenburnie Primary School.

Infrastructure

A wide variety of infrastructure is found throughout the forest. This includes both recreational and management infrastructure. Recreational infrastructure includes various kinds of interpretive signs, gates, fences, trails, tracks, boardwalks, picnic facilities, car parks and viewing platforms. These are found across a wide range of sites across the region. These areas are maintained and upgraded by ForestrySA as necessary. A variety of different kinds of management infrastructure are found across the estate, and include fire towers, depots, roads, airstrips, water sources and quarries.

Both recreational and management infrastructure need to be reviewed periodically as to their continued use. Sites no longer fulfilling a purpose to ForestrySA or the public should undergo triple bottom line review as to their continued use. A number of recreational sites should be reviewed as to their continued use, along with management infrastructure.

Each Native Forest Reserve in the region is named, and further divided into compartments with a unique identifying alpha-numeric code. These are labelled in the field on signs, allowing easy map recognition for on ground works and fire access (eg. Honan NFR compartment 5 is HO5).

Management Actions

- Implement a regular servicing and maintenance program for recreational facilities, trails, structures, signs, and sites.
- Develop a program for upgrade of recreational facilities, structures, signs and sites.
- Record and maintain the locations of recreational facilities, structures, signs, and sites on ForestrySA GIS.
- Produce maps and plans of all recreational sites and infrastructure.
- Review recreational sites including Mt Muirhead Lookout and Tantanoola Forest Information stop as to their continued use.
- Review the long-term use of Nangwarry NFR and Pond Flat NFR airstrips.
- Close and rehabilitate Mount Lyon NFR airstrip.
- Rehabilitate Old Mt Gambier Forest Headquarters depot.
- Assess feasibility of future recreation developments including the possibility of campgrounds.
- Rationalise ownership of various parcels.

Access to ForestrySA Infrastructure for Third Party Use

Access to NFRs by third parties for normal forestry activities is restricted in line with the Forestry Act 1950 and associated Regulations. These regulations govern which activities may occur within reserves, and certain activities may only occur with lawful authority through the permit system. This includes the driving of machinery and activities which are not compatible with the conservation objectives of the reserves. ForestrySA will consider limited access to approved parties for compatible activities under strict conditions to existing roads and infrastructure only. ForestrySA will undertake periodic cost-benefit reviews as to whether these areas continue to be maintained.

Management Actions

- Develop good working relationships with neighbours to ensure that NFR tracks are not accessed by vehicles or machinery relating to commercial operations.
- Permit in limited situations, at third party risk, the use of existing made roads and other infrastructure via the permit system in line with the conservation objectives of the area.
- Undertake periodic cost-benefit reviews as to whether infrastructure should continue to be maintained.
- Permit access to approved parties by mutual agreement to infrastructure outside of NFRs.

7. Fire Management

ForestrySA has developed Fire Management Plans with strategies for the protection of the NFR's and community protection of surrounding land. ForestrySA has its own Country Fire Service (SA) brigade and works in cooperation with the CFS, DEWNR, OneFortyOne Plantations and adjacent landholders in managing fire risk. ForestrySA is a member of the Government Agency Fire Liaison Committee. All bushfire mitigation works are carried out according to guidelines specified in the Fire Management Plan. ForestrySA maintains a network of firebreaks and manages them with an industry standard.

Prescribed Burning

Prescribed burning is a key management tool used in bushfire mitigation. In addition to the management of fuel hazards, prescribed burning is used to achieve ecological and research objectives. Prescribed burning has been used in this region as a tool in native forests since the 1930s. Since that time, practices have evolved to allow greater control over fire intensity and burning duration in recognition of ecological values of the NFRs.

ForestrySA has had delegated Authority since 2008 from the Native Vegetation Council to undertake prescribed burning in line with the FSA Prescribed Burning Manual (ForestrySA 2016). Prescribed burns are undertaken in accordance with the Code of Practice for Fire Management on Public Land in South Australia and the South Australian Prescribed Burning Code of Practice (GAFLC 2009).

ForestrySA has cooperative fire arrangements with DEWNR and operates under a regional Memorandum of Understanding (MOU). OneFortyOne Plantations is also a key stakeholder for both prescribed burning and fire suppression as many NFR's are embedded within the plantation matrix. Both the state and OneFortyOne have Fire Management and Response Protocols relating to Joint Management Areas.

Wildfire History

Fire histories of each NFR are well documented since the 1950s. Notable wildfires in more recent times include the Wandilo fires of 1958 and 2000, Caroline Forest fire in 1979, Ash Wednesday in 1983, Reedy Creek fire in 2014 and the Glencoe Hill fire in 2015.

Fire Management and Suppression

Bushfire mitigation is carried out in accordance with the Fire Management Plan. ForestrySA responds to fires within the forestry estate as well as on private land, working together with landholders, CFA, CFS, and Forest Owners Conference to ensure effective and sustainable fire management.

Signage of the track and road network within the ForestrySA estate has been updated over the last ten years in order to meet GAFLC guidelines in line with other land management agencies in the state.

Fire towers and aerial detection techniques are employed to detect fires during the Fire Danger season. ForestrySA maintains a registered CFS brigade and retains staff on standby for rapid response during the fire season.

Management Actions

- Continue to implement a science based prescribed burn plan.
- Continue to develop relationships with DEWNR for assistance with Prescribed Burning within the scope of the fire cooperative and MOU.
- Continue to develop and maintain Fire Management and Response Protocol with regard to ForestrySA/OneFortyOne Plantations Joint Management Areas.

8. Heritage

Aboriginal Impacts and Heritage

The Green Triangle has a long history of Aboriginal occupation, with a number of groups traditionally occupying the area. The Boandik, or Bunganditj, people were the largest group in the area, and occupied the majority of the area covered by this plan. They shared a boundary with the Meintangk people between Robe and Kingston and across to Mosquito creek near Naracoorte. A smaller group allied with the Boandik, the Pinejunga, occupied an area from Penola through to Naracoorte (Hanna 2001, Watson 2002, Tindale 1974). Aboriginal people were largely unaffected by colonisation in this region until the 1840s.

A number of known Aboriginal heritage sites are found scattered throughout land covered by this plan, illustrating the long history of occupation. These sites range from flint scatters, stone tool workshops and tools, remains of camp sites, rock shelters and caves with markings. In addition to these sites, NFR's contain plants, animals and landforms of Aboriginal economic and cultural importance. One culturally significant site is at Rock Shelter NFR, where evidence of long-term occupation has been found. Flint scatters are the most common type of site encountered across the landscape, and are usually found on dry ground surrounding good water supplies.

Aboriginal impacts on the landscape were largely from fire which was used for both protection and to modify the landscape to bring in animals for food. Much of the wetter country that would carry a fire today would not have burnt during this period prior to being modified by drainage and clearance.

The South Australian Government has responsibility for the protection and preservation of sites of significance. These sites are listed on a 'Register of Aboriginal Sites and Objects' under the *Aboriginal Heritage Act 1988* administered by the Aboriginal Affairs and Reconciliation Division of Department of Premier and Cabinet. It is an offence to damage, disturb, or interfere with any Aboriginal site or damage any Aboriginal object. Once identified, the location of cultural sites is recorded, and protected and managed accordingly. Aboriginal Heritage is also protected under the Commonwealth *Aboriginal and Torres Strait Heritage Protection Act 1984*.

Management Actions

- Identify, protect, and appropriately manage sites of Aboriginal heritage under the Forest Management System and Operational Planning process.
- Facilitate cultural access to the forest through the permit system.
- Record Indigenous cultural sites on the ForestrySA GIS once they become known and confirmed. Notification to the Aboriginal Affairs & Reconciliation Department.
- ForestrySA staff have been trained to report any indigenous sites/objects via the ForestrySA incident reporting system and the significant site record form.
- Appropriate consultation undertaken relating to indigenous cultural heritage.

European Impacts and Heritage

European impacts on native forest reserves stem from all three periods described in Section 2. These impacts have included grazing, cropping of swamps and fertile ground, timber cutting, and from occupation of various sites. Remains of European occupation in the form of buildings, structures, infrastructure and sites of archaeological and historical importance can still be found.

The majority of the NFRs on the deeper and less fertile sands have had low impacts from grazing as they are less accessible and would have produced very little palatable food for stock. Evidence of grazing can be found in limited locations in the more open reserves, and in those containing wetlands. Remains of fences can still be found in larger wetlands in several places. Cropping was undertaken after closer settlement at a number of locations, and included barley, oats, maize, mangels, turnips and potatoes.

Timber, was utilised from the early years in the 1840s (A Adams, Mount Burr Forest Annual Report 1948/49). Products included sawn building timber, weatherboarding, poles, rails, strainers, posts, palings, sleepers, droppers, firewood, and charcoal. In those days, a station could have dozens of shepherds scattered over the lease, and early settlers would have needed materials to build houses on outstations. Remains of one such hut exists at Honan NFR, presumably from the station days of the Leake brothers' Glencoe Lease. Nearby, the remains of old sawpits can still be found, presumably where they prepared the materials for the hut and surrounding facilities (ForestrySA 2005).

Sawmills were located both in the forests and the nearby towns. Evidence can be found on old cut stumps of axe scarfing and cross cut saw back cutting in many locations (ForestrySA Woolwash NFR Plan 1999). Sawpits from an early period can be found at locations including Whennen, Nangwarry, The Woolwash, Honan, and near Windy Hill NFRs. Redgum railway sleepers were harvested in the reserves in Penola Forest from the early 1900s to the mid-1950s. Remains of these operations including uncut reject sleepers can still be found at Round Waterhole NFR.



Neilsen Bush Mill, Penola SA, 1932.

A large proportion of timber was cut for firewood, which was utilised in baker's ovens, for charcoal, in lime production, and cheese factories from the late 1800s. During the Woods and Forests years,

there was great demand for fuel wood until the early 1950s before boilers at factories such as Cellulose Ltd near Millicent switched to oil. Several schemes were undertaken whereby native vegetation was logged for fuel wood, some of which was cleared to make way for pine plantations.

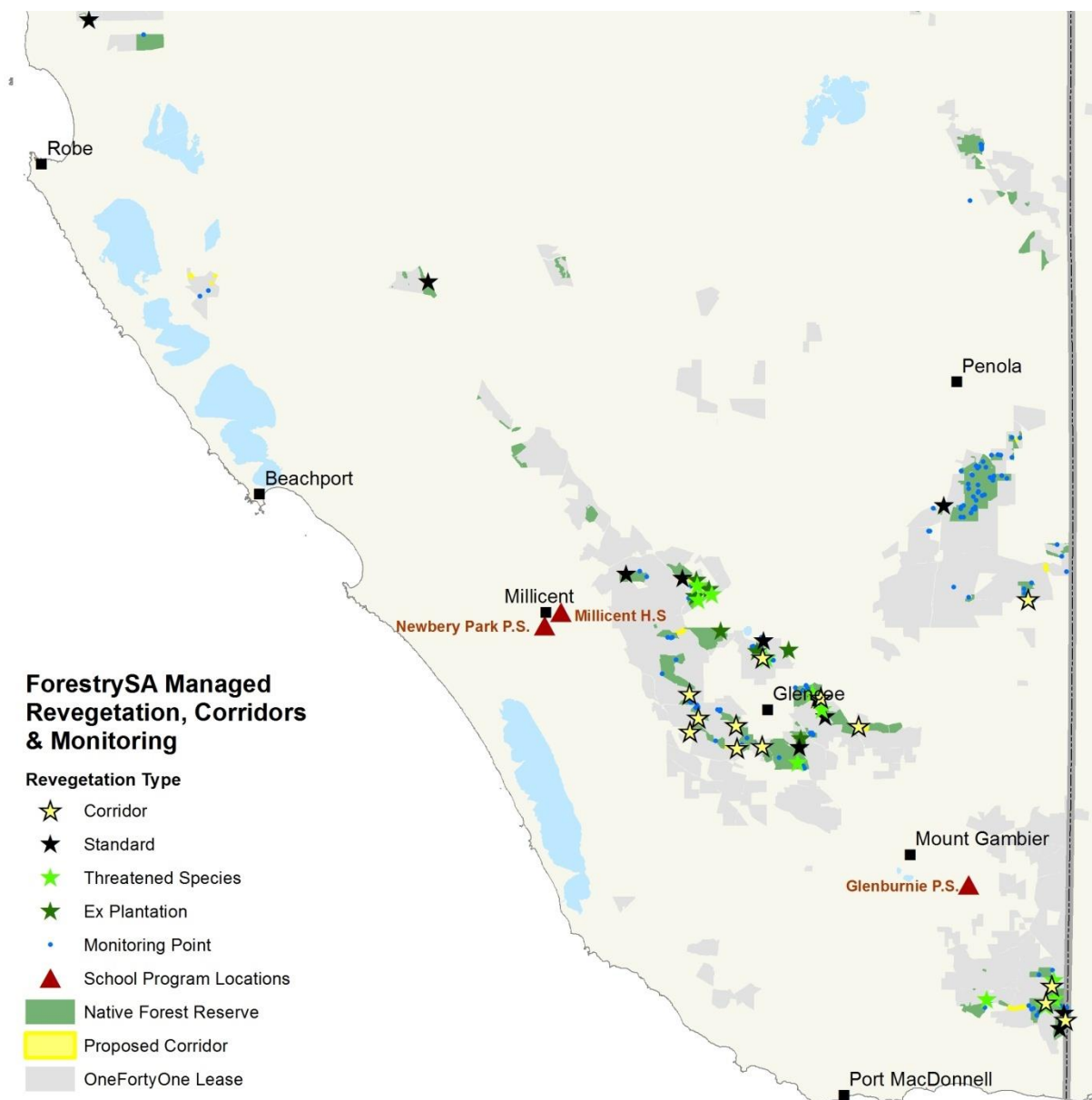
Management Actions

- Sites of cultural or historical significance and interest (including artefacts) will continue to be identified and recorded on the ForestrySA GIS, managed and protected under the Forest Management System and Operational Planning process.
- Consider cultural and heritage interest sites for restoration and conservation programs.
- Encourage the ongoing involvement of the local community and other community programs in the conservation management of cultural heritage sites.
- Pursue external funding as necessary and available for heritage listed buildings and sites to assist in the implementation of conservation restoration works programs.

9. Corridors and Revegetation

Biodiversity Corridors

Native Forest Reserves are scattered throughout a plantation and agricultural landscape as isolated “habitat islands”. This type of landscape can act as a barrier to the movement of many species and impact on the long term survival of both plants and animals. In recognition of this, ForestrySA produced and adopted the South East Biodiversity Corridor Strategy in the early 2000s which contains detailed recommendations and evidence of the type and size of corridors suitable for use in plantations and the way they should be planted to benefit the target species (Horn 2003). The strategy aims to link areas of fragmented native vegetation by replacing plantation or unplanted land with native vegetation.



To date in 2016, 17 corridors have been established, including one on privately owned land. The initial strategy provided for 20 corridors through plantation, with additional corridors on privately

owned land, and several strategic roadside corridors identified for enhancement. After 2010 a further 3 areas were added to the strategy at Mount Lyon, Lake Edward, and Bray.

All corridors planned and established through plantation on crown land are protected under an agreement between the State and OneFortyOne Plantations. ForestrySA continues to have responsibilities for planning and establishing corridors, with OneFortyOne Plantations having responsibilities for weed control and long-term maintenance.

The corridors improve the long-term viability of flora and fauna of the region, while also increasing scientific understanding of the success of revegetation efforts through the use of bird presence/absence and population as an indicator of success. Of particular note, a long term study of bird use by local ornithologist Bob Green continues to be funded by ForestrySA. Results from 10 years of monitoring indicate that an increasing diversity and abundance of birds and arboreal mammals are using biodiversity corridor sites. Species of note include Southern Emu-wren, Bassian Thrush, and Yellow-tailed Black Cockatoos in drier woodland areas and Striated Fieldwren and Lewin's Rail in wetland and sedgeland sites.



Corridor Planting, Snowgum to Dry Creek Corridor, Glenburnie Primary School.



Aerial view of Snowgum to Dry Creek Corridor taken from Dry Creek, Graham Springer.

Revegetation

ForestrySA has undertaken several projects over the preceding decades in both NFRs and adjoining land. Large projects involving the conversion of degraded plantation land back to native vegetation have occurred at locations including The Marshes, Mount Lyon, and Kangaroo Flat NFRs, and around Mount McIntyre since the early 1990s. Works involving plantings have occurred at Whennen, Kay, Dry Creek, Pond Flat, and Muddy Flat NFRs. A large scale project funded by the Native Vegetation Council and managed by ForestrySA at the Wandilo Pasture Strip occurred from 2010 to 2016, and involved a variety of methods ranging from broad scale direct seeding to more thorough restoration. ForestrySA has been a pioneer in the use and development of revegetation techniques including

“clay balls”, where clay, potting mix and seed are mixed together with a concrete mixer, dried, and then sown by hand or machine. The techniques chosen are specific to each site, with flexibility in the type and level of weed control, and method of establishment.

ForestrySA has been involved in threatened flora recovery programs in NFRs. Identification of target species has come from good working relationships and many site visits with staff from Nature Glenelg Trust and Department of Environment, Water and Natural Resources, especially those at Adelaide Botanic Gardens. Winter 2016 marks the first time that the recently discovered Honan Mint (*Mentha atrolilacina*) was propagated and planted in a conservation program along with other species. Threatened species programs have concentrated on areas including Honan NFR, Mount McIntyre area, Mount Lyon area, Hackett Hill NFR, and Caroline Forest.

ForestrySA uses a combination of contractors, community groups, and schools to implement programs.



Planting of Matted Nertera (*Leptostigma reptans*), Honan NFR

Management Actions

- Continue the planning and implementation of the biodiversity corridors program including sites in the Joint Management Area.
- Maintain effort towards monitoring, threatened flora and school based activities.

10. ForestrySA - OneFortyOne Plantations Joint Management

The Green Triangle NFRs are scattered amongst a landscape dominated by agriculture and forestry. Many NFRs are completely embedded within the plantation on crown land leased by OneFortyOne Plantations. In 2012, OneFortyOne Plantations acquired the harvesting and management rights for the forest, and a comprehensive lease agreement was drawn up by the South Australian Government to ensure that public access to the forest continued and the forest is properly cared for.

The agreement covers issues relating to public recreational access, joint management areas relating to fire, corridors, weed and pest management, and lawful use of ForestrySA infrastructure. These topics are covered in the relevant sections.

Public access is addressed in Section 6. Fire management in Section 7, weeds and pests in Section 5, issues relating to biodiversity and access in Sections 4 & 6, and corridors in Section 9.

Management Actions

- Continue to work with OneFortyOne Plantations to ensure obligations of both parties are met regarding Joint Management areas.

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Appendix 1: Threatened communities and habitats known to occur within Green Triangle NFRs

Threatened species, communities and habitats known to occur within the Plan area:	Threatened Community	Rating (SA)
<i>Eucalyptus camaldulensis</i> var. <i>camaldulensis</i> Woodland on seasonally inundated flats	VULNERABLE	1,2
<i>Eucalyptus viminalis</i> ssp. <i>cygnetensis</i> and/or <i>E. viminalis</i> ssp. <i>viminalis</i> Woodland on alluvial soils in moist areas	VULNERABLE	1,2
<i>E. fasciculosa</i> Grassy Woodland on red terra rossa soils of low hills	VULNERABLE	1,2
<i>E. fasciculosa</i> +/- <i>E. leucoxylon</i> Heathy Woodland on sandy loams of flats and slopes.	VULNERABLE	1,2
<i>E. ovata</i> Grassy Low Open Forest in non-saline wetlands	ENDANGERED(1) VULNERABLE (2 part)	1,2
<i>E. ovata</i> +/- <i>E. viminalis</i> ssp. <i>cygnetensis</i> +/- <i>E. camaldulensis</i> var. <i>camaldulensis</i> Low Woodland in valleys and drainage lines	VULNERABLE VULNERABLE (2 part)	1,2
<i>Allocasuarina verticillata</i> Grassy Low Woodland on clay loams of low hills	VULNERABLE	1,2
<i>Banksia marginata</i> Grassy Low Woodland on sandy loam plains in higher rainfall areas	ENDANGERED	1,2
<i>Leptospermum lanigerum</i> Closed Shrubland in non-saline wetlands	ENDANGERED	1,2
<i>Melaleuca squamea</i> +/- <i>Leptospermum continentale</i> Closed Shrubland on peaty soils	VULNERABLE	1,2
<i>Themeda triandra</i> +/- <i>Danthonia</i> spp. Tussock Grassland on heavy, fertile soils of plains and hill slopes.	ENDANGERED	1,2
<i>Gahnia filum</i> Sedgeland in drainage lines and depressions	VULNERABLE	1,2
<i>Gahnia trifida</i> Sedgeland in drainage lines and depressions (of fresher water than <i>G. filum</i>)	ENDANGERED	1,2
<i>Baumea arthrophylla</i> Sedgeland in drainage lines and depressions	VULNERABLE	1
Freshwater wetlands eg <i>Triglochin procerum</i> Herbland (Floating Water Plant Herbland)	ENDANGERED	1,2
<i>Melaleuca gibbosa</i> - <i>Hakea rugosa</i> Shrubland	ENDANGERED	1,2
<i>Baumea juncea</i> - <i>Chorizandra enodis</i> Sedgeland and other sedgeland complexes	VULNERABLE	1,2
<i>Eucalyptus obliqua</i> Open Forest	VULNERABLE	2
<i>Eucalyptus arenacea</i> - <i>E.viminalis</i> ssp. <i>cygnetensis</i>	RARE	2
<i>Eucalyptus leucoxylon</i> ssp <i>megalocarpa</i> Low Woodland	RARE	2
<i>Eucalyptus falciformis</i> Low Open Forest	RARE	2
<i>Melaleuca halmaturorum</i> Tall Closed Shrubland	RARE	2
<i>Phragmites australis</i> - <i>Typha domingensis</i> Grassland	RARE	2
<i>Poa</i> spp.- <i>Austrostipa stipoides</i> Grassland	RARE	2
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	CRITICALLY ENDANGERED (AUS)	3

Sources:

- 1: Provisional List of Threatened Ecosystems of South Australia DEWNR 2001
 - 2: The Biological Resources of the South East of South Australia (Draft) Croft and Carpenter 2007 (2010)
 - 3: EPBC Act lists And, Biodiversity Plan for the South East of South Australia, Croft et. al 2001
- Note: List is in no particular order. Further revisions are being undertaken by Troy Horn and Bryan Haywood, but are unpublished at this stage.

Appendix 2: Management Action Summary

Section	Action
History	<ul style="list-style-type: none"> Continue to staff and manage the region with appropriate resources to meet Community Service Obligations and objectives under the Australian Forestry Standard.
Landscapes and Water	<ul style="list-style-type: none"> Continue to manage and protect caves and sinkholes for conservation purposes and ensure adequate protection at each site. Maintain public safety through restricted access to karst features Uphold conservation values by altering access to karst features as necessary Continue to allow scientific and research activities relating to Landscapes and Water.
Biodiversity Conservation	<ul style="list-style-type: none"> Work with other agencies as necessary towards improving the status of threatened species, communities, and habitats. Continue existing monitoring programs and/or establish new monitoring as necessary. Maintain biodiversity databases (weeds, flora, and fauna). Maintain the program for collection and storage of biological data using a variety of professional, community program, and volunteer sources. Provide this data to DEWNR on a periodic basis. Update relevant NFR resource information as required. Complete the Green Triangle NFRs Resource Book. Maintain links with other natural resource management programs to further develop communication on conservation issues and priorities and to provide opportunities to further develop integrated regional conservation programs and to access funds for on-ground works. Continue to foster relationships with adjoining landholders to encourage integrated conservation management. Continue active encouragement of participants and volunteers through Community Engagement programs to increase involvement in biodiversity conservation activities. Develop good working relationships with neighbours to ensure that firebreaks around NFRs are used and managed appropriately. Encourage neighbouring land managers to undertake a thorough environmental assessment survey prior to their considered use of high impact activities around NFRs (including but not limited to pest plant control, roading, grading, heavy machinery use and transport routes). Work with neighbouring land managers to promote appropriate buffers and setbacks adjacent to NFRs. Work with neighbouring land managers to ensure appropriate and legal management of native vegetation encroaching on external firebreaks.
Weeds and Pests	<ul style="list-style-type: none"> Continue to implement a flexible science based weed and pest control program Maintain (and update regularly) the corporate weeds database and Weed Strategy Ensure staff and contactors are able to carry out weed and pest control in an environmentally sensitive manner Prioritise weed and pest control sites to maximise environmental benefit Continue to implement the ForestrySA/OneFortyOne Plantations Pest Management Strategy, developed jointly between the parties.

Section	Action
Community Use and Infrastructure	<ul style="list-style-type: none"> • Manage the forest for recreation and maintain facilities to appropriate standard. • Implement a regular servicing and maintenance program for recreational facilities, trails, structures, signs, and sites. • Periodical reviews will be undertaken for trail upgrades, closures, re-routes, developments or extensions that will be undertaken in line with ForestrySA policies and guidelines. • Any purpose built tracks or trails will be established and maintained to relevant Standards (such as AS2156-1-2001). • Erect appropriate signage in line with the ForestrySA sign manual. • Access for horse riders to forest trails (excluding NFRs) will continue to be made available. • Encourage input from the Limestone Coast Tourism Committee and the Limestone Coast Regional Development Board, State and Local Government agencies and peak user group organisations, regarding future recreational trail and tourism development opportunities. • Continue to support appropriate community events in the Green Triangle. • Proposals for commercial activities will be considered in line with ForestrySA policies and guidelines. • Provide guidelines for recreation access and permits for approved activities on ForestrySA land and on crown land leased by OneFortyOne Plantations via the ForestrySA website. • Provide recreation areas throughout the OneFortyOne Plantations lease, and undertake periodic review of sites. Provide written notification to OneFortyOne Plantations of recreational permits issued on their lease as they are issued. • Enforce the Forestry Act and Regulations to ensure compliance.
Community Use and Infrastructure - Community Environmental Programs	<ul style="list-style-type: none"> • Continue to support community engagement and seek to develop opportunities for participation in community programs and volunteers. • Adjoining public land managers, other neighbours, NGOs and community groups will be actively engaged to develop and implement coordinated management programs.
Community Use and Infrastructure - Infrastructure	<ul style="list-style-type: none"> • Implement a regular servicing and maintenance program for recreational facilities, trails, structures, signs, and sites. • Develop a program for upgrade of recreational facilities, structures, signs and sites. • Record and maintain the locations of recreational facilities, structures, signs, and sites on ForestrySA GIS. • Produce maps and plans of all recreational sites and infrastructure. • Review recreational sites including Mt Muirhead Lookout and Tantanoola Forest Information stop as to their continued use. • Review the long-term use of Nangwarry NFR and Pond Flat NFR airstrips. • Close and rehabilitate Mount Lyon NFR airstrip. • Rehabilitate Old Mt Gambier Forest Headquarters depot. • Assess feasibility of future recreation developments including the possibility of campgrounds. • Rationalise ownership of various parcels.
Access to ForestrySA Infrastructure for Third Party Use	<ul style="list-style-type: none"> • Develop good working relationships with neighbours to ensure that NFR tracks are not accessed by vehicles or machinery relating to commercial operations. • Permit in limited situations, at third party risk, the use of existing made roads and other infrastructure via the permit system in line with the conservation objectives of the area. • Undertake periodic cost-benefit reviews as to whether infrastructure should continue

Section	Action
	<p>to be maintained.</p> <ul style="list-style-type: none"> Permit access to approved parties by mutual agreement to infrastructure outside of NFRs.
Fire Management	<ul style="list-style-type: none"> Continue to implement a science based prescribed burn plan. Continue to develop relationships with DEWNR for assistance with Prescribed Burning within the scope of the fire cooperative and MOU. Continue to develop and maintain Fire Management and Response Protocol with regard to ForestrySA/OneFortyOne Plantations Joint Management Areas.
Heritage – Aboriginal	<ul style="list-style-type: none"> Identify, protect, and appropriately manage sites of Aboriginal heritage under the Forest Management System and Operational Planning process. Facilitate cultural access to the forest through the permit system. Record Indigenous cultural sites on the ForestrySA GIS once they become known and confirmed. Notification to the Aboriginal Affairs & Reconciliation Department. ForestrySA staff have been trained to report any indigenous sites/objects via the ForestrySA incident reporting system and the significant site record form. Appropriate consultation undertaken relating to indigenous cultural heritage.
Heritage - European	<ul style="list-style-type: none"> Sites of cultural or historical significance and interest (including artefacts) will continue to be identified and recorded on the ForestrySA GIS, managed and protected under the Forest Management System and Operational Planning process. Consider cultural and heritage interest sites for restoration and conservation programs. Encourage the ongoing involvement of the local community and other community programs in the conservation management of cultural heritage sites. Pursue external funding as necessary and available for heritage listed buildings and sites to assist in the implementation of conservation restoration works programs.
Corridors and Revegetation	<ul style="list-style-type: none"> Continue the implementation of the biodiversity corridors program including sites in the Joint Management Area. Maintain effort towards monitoring, threatened flora and school based activities.
ForestrySA - OneFortyOne Joint Management	<ul style="list-style-type: none"> Continue to work with OneFortyOne to ensure obligations of both parties are met regarding Joint Management areas.

Appendix 3: Legislation

Commonwealth Legislation and Policies

Main legislation	Agency	Purpose
Aboriginal and Torres Strait Islander Heritage Protection Act 1984	Department of Sustainability, Environment, Water, Population and Communities	Preserve and protect places, areas and objects of particular significance to Indigenous people in accordance with their tradition
Environmental Protection and Biodiversity Conservation Act 1999	Department of the Environment, Water, Heritage and the Arts	It provides a framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places.
National Forest Policy Statement 1992	Australian, State and Territory Governments	This is the blue print for the future of public and private forests. It outlines agreed objectives and policies for the future of Australia's public and private forests.
Native Title Act 1993	National Native Title Tribunal	Acknowledges native title and provides mechanisms to protect native title interests.
National Strategy for the Conservation of Australia's Biological Diversity 1996	Department of Sustainability, Environment, Water, Population and Communities	It deals at a global level with the full range of biological diversity conservation, its sustainable use and the fair and equitable sharing of benefits arising from this use.

State Legislation, Policies and Codes

Main legislation	Agency	Purpose
Aboriginal Heritage Act 1988 (SA)	Aboriginal Affairs & Reconciliation Division	Act provides for the protection and preservation of the Aboriginal sites, objects and remains.
Agricultural and Veterinary Products (Control of Use) Act 2002 (SA)	Primary Industries and Resources South Australia	Act regulates the use of agricultural and veterinary chemicals in SA.
Environment Protection Act 1993 (SA)	Environmental Protection Authority	Act promotes the principles of ecologically sustainable development based on sound environmental practices and policies that restore and enhance the quality of the environment.
Fire and Emergency Services Act 2005 (SA)	Country Fire Service	Act provides for a country fire service to provide for the prevention, control and suppression of fires.
Forestry Act 1950	ForestrySA	Act provides for the establishment and protection of forest reserves and native forest reserves. The associated regulations provide details of restricted activities.

Main legislation	Agency	Purpose
Good Neighbour Charter for Commercial Tree Growing in the Green Triangle Region of South Australia and South Western Victoria	Green Triangle Regional Plantation Committee	This Charter was prepared in order to enhance communication between commercial tree farmers, their neighbours and community groups; to help enable them to work in partnership to address local issues of mutual concern.
Heritage Places Act 1993 (SA)	South Australian Heritage Council	Act provides for the protection and preservation of non-Aboriginal heritage.
National Parks and Wildlife Act 1972 (SA)	Department of Environment, Water and Natural Resources	Act provides for the protection of flora, fauna, threatened species and activities that impact on them.
Native Vegetation Act 1991 (SA)	Department of Environment, Water and Natural Resources	Act provides for the preservation of native vegetation and includes legislative controls for native vegetation clearance.
Natural Resources Management Act 2004 (SA)	Department of Environment, Water and Natural Resources	Act promotes sustainable and integrated management of SA's natural resources and makes provision for their protection.
Work Health and Safety Act 2012 (SA)	Work Cover SA	An Act to provide for the health, safety and welfare of persons at work.