# Fire Management Plan

## Reserves of the South-western Fleurieu Peninsula

**2009-2019**

*Incorporating Deep Creek Conservation Park, Talisker Conservation Park, Eric Bonython Conservation Park and Waitpinga Conservation Park*

Department for Environment and Heritage

Government of South Australia

PREPARE. ACT. SURVIVE. BUSHFIRE READY

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## EXECUTIVE SUMMARY

This Fire Management Plan for the Reserves of the South-western Fleurieu Peninsula includes: Deep Creek, Talisker, Eric Bonython and Waitpinga Conservation Parks located in the south-western Fleurieu Peninsula area. The area was identified as a priority for fire management planning within Department of Environment and Heritage (DEH) Adelaide Region to address the following issues.

- High visitor numbers within Deep Creek Conservation Park (CP), particularly during the fire season.
- Protection of species and communities of conservation significance, especially the Nationally *Endangered* Mount Lofty Ranges (MLR) Southern Emu-wren (*Stipiturus malachurus intermedius*), MLR Chestnut-rumped Heathwren *(Hylacola pyrrhopygia parkeri*), Southern Brown Bandicoot (*Isoodon obesulus obesulus*) and the Nationally *Critically Endangered* Swamps of the Fleurieu Peninsula ecological community.
- Protection of the Silverton township adjacent Talisker CP.
- General protection of life, property and environmental values in the plan area.
- Landscape protection of Deep Creek CP, to reduce the likelihood of the whole reserve burning in single fire event.

These issues are addressed by:

- applying a risk assessment process to identify life, property and environmental values at risk from bushfires;
- applying DEH Fire Management zoning principles to manage fuel in Asset and Buffer Zones and designate Conservation Zones;
- applying DEH Ecological Fire Management Guidelines to determine appropriate fire regimes in Conservation Zones; and
- auditing tracks within the reserves of this plan using the Government Agencies Fire Liaison Committee's (GAFLC) guidelines for firebreaks and fire access tracks in South Australia.

A number of actions as a result of applying the above processes are recommended, including:

- prescribed burning to:
    - reduce fuel in Asset, Buffer and Conservation Zones as outlined in the plan (other methods of fuel reduction will also be used, and in some cases are specifically mentioned);
    - reduce fuel in strategic areas within the Conservation Zone to provide some landscape protection for the reserve (that is to reduce the possibility an entire block or reserve burning in one fire event); and
    - increase patchiness within vegetation to enhance habitat for MLR Southern Emu-wren and Southern Brown Bandicoot.
- alteration and/or upgrade of fire access points and track classifications to increase the:
    - safety of firefighting personnel involved in a fire suppression effort;
    - response time of fire suppression agencies; and

    - type of resources that can safely be deployed to assist in a fire suppression effort.
- identification of suppression considerations that may assist bushfire suppression operations and to contribute to improved fire management; and
- development of an emergency procedure/action plan that addresses visitor/staff safety during bushfires.

The draft plan was released for public comment for a period of four weeks. Comments were evaluated and incorporated where considered appropriate. A major review of this plan will occur after ten years of implementation, or earlier if required.

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# 1 SCOPE AND PURPOSE

Deep Creek CP was identified as a priority for fire management planning in the Department for Environment and Heritage (DEH) Adelaide Region. Talisker, Eric Bonython and Waitpinga Conservation Parks have also been included as they are located in the south-western Fleurieu Peninsula area.

The purpose of this plan is to provide a strategic framework for fire management activities in the planning area, which includes Deep Creek, Talisker, Eric Bonython and Waitpinga Conservation Parks. The plan defines objectives for ecological fire management and life and property protection, particularly in relation to visitor safety (campgrounds and accommodation) and neighbours. It outlines strategies and proposes works to meet these objectives. The works will increase the level of bushfire preparedness and guide suppression strategies during bushfire incidents.

This Fire Management Plan aims to:

- Assess the level of risk and the existing fire management and reserve management objectives;
- Define objectives for fire management in the reserves;
- Outline strategies for risk mitigation and propose operational works to increase the level of bushfire preparedness and guide suppression management during bushfire incidents.

Important issues are:

- The high visitor numbers, particularly over the fire season to Deep Creek CP;
- Protection of species and communities of conservation significance, especially the Nationally *Endangered* MLR Southern Emu-wren, MLR Chestnut-rumped Heathwren, Southern Brown Bandicoot and the Nationally *Critically Endangered* Swamps of the Fleurieu Peninsula ecological community;
- Protection of the Silverton township adjacent Talisker CP;
- General protection of life, property and environmental values in the area;
- Landscape protection of Deep Creek CP, to reduce likelihood of whole reserve burning in single fire event.

Operational works in this plan will be implemented in a staged manner, as resources become available. Neighbouring properties are considered in this plan, but only in the context of works and activities required to minimise the likelihood of fires burning out of DEH reserves and impacting these assets. Fire management planning for land outside DEH reserves is the responsibility of the Yankalilla District Bushfire Prevention Committee (DPBC) in accordance with the requirements of the *Fire and Emergency Services Act 2005*. DEH is represented on this committee along with the Country Fire Service (CFS) and Local Government.

Four maps are provided as an attachment to this plan. Map 1 illustrates terrain, tenure and infrastructure; Map 2 displays floristic vegetation; Map 3 shows fire history and Map 4 shows the plan area in terms of the management strategies presented in Section 11 (Block Prescriptions).

# 2 THE PLANNING FRAMEWORK

## 2.1 Legislation

Under the provisions of the *National Parks & Wildlife Act 1972* (NPW Act), DEH has responsibilities for fire management in Reserves constituted under this Act.

The *Fire and Emergency Services Act 2005* outlines the responsibilities of DEH and fire authorities in relation to fire management in National Parks and Wildlife Reserves. Under this Act, the Chief Officer of the CFS must take steps to have any relevant provisions of a management plan for a government reserve brought to the attention of members of CFS who might exercise powers under this section with respect to the reserve.

In prescribing any works or activities that involve clearance or the use of fire (also defined as 'clearance' under the *Native Vegetation Act 1991*), the plan must also meet the provisions under the *Native Vegetation Act 1991*. All prescribed burns must be approved through the process delegated to DEH by the Native Vegetation Council (NVC).

The Federal *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999* describes the assessment and approval process required for actions likely to impact matters of national environmental significance (e.g. Nationally listed species and ecological communities).

## 2.2 DEH Fire Management Policy

DEH has a Fire Management Policy, which states "DEH will manage fire in the State's reserve system to protect life, property and environmental assets and enhance the conservation of natural and cultural heritage" (DEH 2005a). This policy outlines a number of key principles relating to bushfire suppression, prescribed burning and fuel reduction:

- Fire is recognised as a natural component of the South Australian environment and ecosystems conserved in the reserve system;
- The maintenance of biodiversity and ecosystem processes in reserves is dependent on appropriate fire regimes;
- Fire should be managed in a way that protects and maintains biodiversity values as well as providing for the protection of life and property.

The policy also states "DEH is committed to the planned use of fire (prescribed burning) as a management tool for reducing fuel hazard to protect life, property and biodiversity values, and for ecological management" (DEH 2005a). Property protection activities, where recognised as a priority, will be carried out in such a way to minimise the negative impacts on biodiversity.

The policy specifies that Fire Management Plans will provide the framework for:

- The management of bushfire suppression, including identification of strategic access and control lines;
- Prescribed burning for ecological management and fuel reduction purposes.

## 2.3 Zoning Policy

DEH has a Zoning Policy that outlines the zoning standard that is used for fire management planning on DEH managed lands (DEH 2006j). Zoning is derived from:

- The level of perceived risk, using the *Policy and Procedure for Risk Assessment in DEH Fire Planning* (DEH 2006l);
- The Overall Fuel Hazard, which is assessed using the *Overall Fuel Hazard Guide for South Australia* (DEH 2006g); and
- The activities considered appropriate to mitigate the threat that fire poses to life, property and environmental assets.

Three distinct zones exist (Asset (A-zone), Buffer (B-zone) or Conservation zone (C-zone)) and these are applied according to landscape objectives. A- and B-zones are determined by fuel management objectives whereas C-zones are designated to assist in the conservation of biodiversity through the application of appropriate fire regimes (DEH 2006j). For more information on zoning, refer to Section 8 of this plan (Fire Management Zones) and the *Policy and Procedure for Fire Management Zoning in DEH Fire Planning* (DEH 2006j).

## 2.4 Local and Regional Environmental Planning

Deep Creek CP represents the largest remnant of natural vegetation on the Fleurieu Peninsula. The reserves covered in this fire management plan provide important habitat for many species and communities, including those of National conservation significance listed under the EPBC Act. Recovery Plans are prepared, adopted and implemented for threatened species and communities (other than conservation dependent species) listed under the Act, at the discretion of the Australian Government Minister for the Environment and Water Resources. The following species either have Recovery Plans that are under development or in place:

- MLR Southern Emu-wren (MLRSEW & FPS Recovery Team 2007b).
- Southern Brown Bandicoot (Haby and Long 2005).
- Fleurieu Peninsula Swamps (recovery statement) (MLRSEW & FPS Recovery Team 2007c).
- Hindmarsh Valley Greenhood *(Pterostylis bryophila)* (Quarmby 2006).

The Reserves of the South-western Fleurieu Peninsula are part of the *Kanmantoo IBRA Region* (Interim Biogeographical Regionalisation for Australia) (DEH (Cwlth) 2005), which has survey data included within *Biological Survey of the Southern Mt. Lofty Ranges, SA* publication (Armstrong *et al.* 2003). This survey was conducted as part of the greater *Biological Survey of SA*, with the objectives of:

- Improving knowledge of South Australian biodiversity;
- Determining biological variation across the state; and
- Managing nature conservation in the long-term.

The *Biodiversity Plan of the Mount Lofty Ranges* is a regional biodiversity plan, which is currently being prepared by DEH (DEH in prep). The Biodiversity Plan will be implemented in order to guide the conservation, management and rehabilitation of habitats at a regional level.

The *Integrated Natural Resource Management Plan* has been developed for the Mount Lofty Ranges and Greater Adelaide Region (Matthews and Lewis 2003), which identifies the following objectives for managing fire for biodiversity gain:

- Fire management leading to enhanced biodiversity assets;

- Reduced bushfire frequency;
- Fire used in suitable circumstances to achieve planned biodiversity outcomes.

The *Strategic Plan* of the SA Government states under *Objective Three – Attaining Sustainability*, a target of *No Species Loss* (T3.8) (DPC 2004). As a result of this target, a draft strategy entitled *No Species Loss: A Biodiversity Strategy for South Australia 2006-2016* has been produced (DEH 2006f). The South-western Fleurieu Peninsula is located in the Mediterranean biome (encompassing part of the *Kanmantoo IBRA Region)* in which a key threat to biodiversity is inappropriate fire regime (DEH 2006f).

The fire management planning objectives, strategies and works outlined in this plan were developed with careful consideration given to providing for the maintenance of ecological integrity. This plan is consistent with recovery plan strategies and the objectives outlined in other local and regional environmental plans.

## 2.5 Reserve Management Planning

Reserve management plans are a statutory requirement under the NPW Act. Reserve management plans provide the overarching strategy for all management activities in reserves.

In relation to fire, a reserve management plan will:

- Provide an overview of any fire-related issues in the reserve in question.
- State DEH responsibilities for managing fire in the reserve system in accordance with DEH Fire Management Policy.
- Identify the requirement for a Fire Management Plan based on the nature of any fire-related issues.

Fire Management Plans will be prepared for all fire-prone reserves, consistent with the objectives of the reserve management plan. In the absence of a reserve management plan, a Fire Management Plan for a reserve may still be prepared consistent with the objectives of the NPW Act.

The overall management of Deep Creek and Talisker Conservation Parks is described in the *Deep Creek and Talisker Conservation Parks Management Plan* (DENR 1997). Eric Bonython and Waitpinga Conservation Parks do not have a reserve management plan.

There are a number of specific comments relating to fire management objectives, suppression strategies and prescribed burning within the *Deep Creek and Talisker Conservation Parks Management Plan*. These comments should be considered in context with the age of the document. Recently there has been a shift in fire management policy and in protection and suppression strategies across Australia. Given this shift, an amendment has been adopted for the reserve management plan (DEH 2007a). The strategies outlined within the amendment are to:

- Prepare, implement and review Fire Management Plans in association with CFS and other stakeholders.
- Undertake fire management activities (including prescribed burning) for the protection of life and property or for the conservation of species or ecological communities of conservation significance in accordance with DEH policies and

procedures, and undertake monitoring to determine appropriate management of conservation values post-fire.

- Continue to work with the relevant DBPC and CFS to minimise risk to life and property within and surrounding the parks.

This Fire Management Plan is consistent with the strategies and direction outlined within the reserve management plan amendment.

## 2.6 Consultation

DEH is committed to close cooperation and involvement with State and Commonwealth organisations, special interest groups and the broader community to achieve the goals of biodiversity conservation and protection of life and property. To achieve this, the CFS, DBPC, lessees, conservation groups and ecologists have been consulted during the development of this plan.

DEH fire management plans are prepared and adopted in accordance with the *Policy and Procedures for Fire Management Planning: Project Management and Consultation* (DEH 2007b). Consultation is not a statutory requirement for fire management plans but is a Departmental policy. The plan was put forward for DEH internal consultation for a period of four weeks and was released externally for public consultation also for a period of four weeks. Comments were incorporated where considered appropriate.

## 2.7 General Objectives for Fire Management

DEH has a responsibility for fire management within the reserves incorporated into this Fire Management Plan. Fire management objectives that apply to all the reserves in the plan area are:

- To provide for the protection of human life and property during bushfire events;
- To ensure that sound conservation and land management principles are applied to fire management activities (where information is available on species, habitat, cultural and built heritage, ensure these are taken into account during suppression activities);
- To provide for the strategic containment of bushfires (for example, minimise the likelihood of fire entering or exiting a block from adjacent areas);
- To complement District Bushfire Prevention Plans;
- To establish/maintain perimeter access (this may not be possible in all cases where reserves such as Waitpinga and Eric Bonython Conservation Parks have limited or no access);
- To undertake bushfire suppression activity in a safe and professional manner;
- To minimise the area burnt by bushfires;
- To manage fire regimes to ensure consistency with the fire management guidelines in C-zones.

## 2.8 Mapping

Four maps have been produced to complement this Fire Management Plan. These maps are provided as an attachment to the plan.

Map 1 (Terrain, Tenure and Infrastructure) illustrates physical landscape features with land ownership, generalised land use and infrastructure relevant to the plan area, this includes:

- Physical landscape, displayed using a combination of contours, drainage & water bodies;
- DEH reserves, shown in context with neighbouring land tenures;
- Generalised land use, including built up areas, recreational reserves as well as the distribution of native and planted vegetation (orchards, vineyards and pine plantations);
- Regional scale infrastructure, including roads, CFS stations and communication towers.

Map 2 (Vegetation Communities and Significant Species) depicts:

- Vegetation communities mapped as Major Vegetation Sub-groups;
- MLR Southern Emu-wren sightings with a 100 metre buffer around the sightings;
- Significant areas for the Southern Brown Bandicoot.

Map 3 (Fire History) provides:

- A snap shot in time of the fire history for the plan area;
- The last fire scar shown by year.

Map 4 (Fire Management and Access) shows the plan area in terms of the management strategies presented in Section 11 (Block Prescriptions), this includes:

- Proposed zoning, displayed in a context of fire management block boundaries;
- Proposed burn areas. Note: each burn area identified may not be burnt in its entirety within a season (i.e. the burn may itself be patchy, or the area could be divided and burnt over a number of seasons);
- Current fire access symbolised according to the GAFLC track classification;
- Fire related infrastructure and infrastructure other than roads, including gates, buildings and leased assets where data are available;
- Significant assets within and adjacent the reserves.

# 3 BUSHFIRE ENVIRONMENT

The Reserves of the South-western Fleurieu Peninsula are located in an area with a high potential for bushfires. The likelihood of bushfire ignition is exacerbated by high visitor numbers (particularly within Deep Creek CP), vegetation communities and *Very High* to *Extreme* fuel hazard across the plan area.

## 3.1 Location

All of the reserves covered by this plan are located on the south-western Fleurieu Peninsula (Map 1), within the District Council of Yankalilla. The reserves are part of DEH Adelaide Region and managed by the DEH Fleurieu District from the Deep Creek CP headquarters.

Deep Creek CP (4 428 ha) is situated 13 km east of Cape Jervis. Talisker CP (216 ha) is located 3 km west of Deep Creek CP. Waitpinga CP (3 ha) is located approximately 4 km north-east of Deep Creek CP and 1 km north of Eric Bonython CP. Eric Bonython CP (6 ha) is located 3 km east of Deep Creek CP. Second Valley Forest Reserve, managed by ForestrySA is situated directly north of Deep Creek CP.

## 3.2 Climate, Wind and Weather

Climate effects the length of the season during which bushfires may be experienced. The Fleurieu Peninsula has cool wet winter, and warm to hot dry summers, with 25°C being the average monthly maxima. Rainfall predominantly occurs in winter, varying across Deep Creek CP with 500 mm annual rainfall recorded near Blowhole Beach to 900 mm annual rainfall recorded at the higher altitudes of the reserve (DEP 1985).

The prevailing wind is generally south to south-easterly, often freshening in the late afternoon. Prevailing mid-summer winds are north to north-westerly. These winds produce higher temperatures and lower humidity (DEHAA 1999). Extreme fire weather conditions generally occur on days with hot, northerly winds and low humidity. Strong, local winds that vary due to the terrain are common within Deep Creek CP. Fires have been known to spread against the prevailing district wind direction, as was the case during the 1980 and 1983 bushfires that occurred in the plan area (DEHAA 1999).

## 3.3 Terrain

The terrain in Deep Creek CP varies from gentle slopes in the northern sections of the reserve, through to steep valleys towards the coast and southern boundary of the reserve (Map 1). Aaron, Tent Rock, Deep and Boat Harbor Creeks intersect the steep coastal cliffs, meeting the coast at small bays. The major creeks are usually perennial with water from upstream springs. Talisker CP has a lower elevation in the southern section of the reserve grading to higher elevation near the Silverton township on the north-east side of the reserve. Steep valleys can be found throughout the central area of the reserve. Waitpinga and Eric Bonython Conservation Parks have gentle slopes in comparison to the other reserves in the plan area. Waitpinga CP has a creek running through the reserve.

Due to the fuel within Deep Creek CP, fire can quickly spread into inaccessible terrain under extreme weather conditions. Steep slopes can influence fire behaviour and also make suppression in such areas challenging.

## 3.4 Fuel

Fuels in forests, woodlands and shrublands can be divided into layers, based on their position in the vegetation profile (Figure 1).

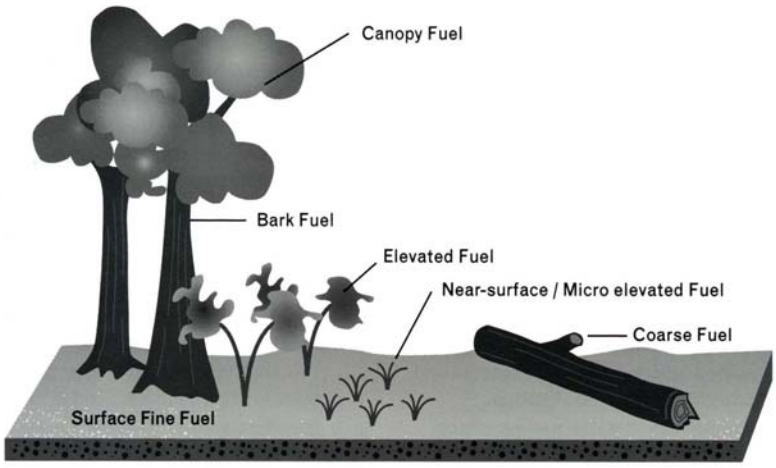
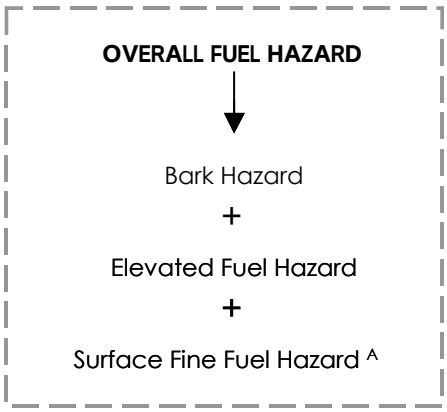



**FIGURE 1 – COMPONENTS OF FUEL IN VEGETATION**

Source: (Tolhurst and Cheney 1999)

### *3.4.1 Overall Fuel Hazard*

The Overall Fuel Hazard is used in fire management planning to determine the level of risk posed by bushfire to life, property and environmental assets during the risk assessment process. The Overall Fuel Hazard is derived from the assessment of four fuel layers in vegetation, as shown in Figure 2.




A *Surface Fine Fuel Hazard adjusted to account for the presence of Near Surface Fuel*

**FIGURE 2 – OVERALL FUEL HAZARD**

Each fuel layer contributes to different effects of fire behaviour: flame depth and height, surface fire combustion and rate of spread, spotting and crown fire (DEH 2006g). Each layer, as well as the Overall Fuel Hazard level can be assessed as: *Low*, *Moderate*, *High*, *Very High* or *Extreme*.

The Overall Fuel Hazard was assessed by sampling across the plan area. The outcome of the assessment is explained in more detail for each reserve in Section 11 (Block Prescriptions). For more information on fuel hazard assessment methodology and evaluation refer to the *Overall Fuel Hazard Guide for South Australia* (DEH 2006g).

### 3.4.2 Likely Maximum Overall Fuel Hazard

Maximum Overall Fuel Hazard levels have been estimated for Major Vegetation Sub-groups (MVS) within the plan area in order to provide a guide for fire management (Table 1). The process used to derive MVS is described in Section 6.1 (Major Vegetation Sub-groups) and the extent of each MVS within the plan area is shown on Map 2.

The vegetation communities dominated by Messmate Stringybark *(Eucalyptus obliqua)* (MVS No. 4 and 8) tend to have a *Very High* or *Extreme* Overall Fuel Hazard due to the level of bark hazard present. *Extreme* bark hazard is likely in these areas where the bark has not been burnt for a long period. Untreated bark hazard in the stringybark areas has the potential for spot fires to start ahead of the fire front, caused by embers and firebrands blown in the wind.

Vegetation communities along the southern section of Deep Creek CP, such as those dominated by Pink Gum *(Eucalyptus fasciculosa)* that feature Drooping Sheoak *(Allocasuarina verticillata)* and Kangaroo Thorn *(Acacia paradoxa)* (MVS No. 9), will tend to have an Overall Fuel Hazard of *Very High* to *Extreme* due to the level of elevated fuel hazard present. This will also vary depending on the time since last fire. Areas that have a *Low* Overall Fuel Hazard, are either grazed by kangaroos or have been cleared of vegetation, such as the areas unclassified vegetation as depicted on Map 2.

The likely maximum Overall Fuel Hazard for MVS can be used for planning and incident management, however should be supported by on-ground sampling as areas of vegetation remain unmapped and it is likely that other factors (such as high weed density) will influence the Overall Fuel Hazard. Refer to Section 7.4 (Weeds) for more information regarding invasive plants in the plan area.

**TABLE 1 – LIKELY MAXIMUM OVERALL FUEL HAZARD FOR MVS**

| MVS No | MVS Name | Dominant Species Layers | Likely Maximum Overall Fuel Hazard | Significant Fuel Layers |
|---|---|---|---|---|
| 4 | *Eucalyptus* forests with a shrubby understorey | *Eucalyptus obliqua, E. ovata* var. *ovata, E. baxteri, E. cosmophylla, Hakea rostrata, Banksia marginata, Acacia pycnantha, Melaleuca decussata, Exocarpos cupressiformis, Leptospermum myrsinoides, Goodenia ovata, Epacris impressa, Xanthorrhoea semiplana* ssp. *tateana, Pteridium esculentum, Platylobium obtusangulum, Hibbertia riparia, Persoonia juniperina, Pultenaea daphnoides* | Extreme | Surface; Elevated; Bark[1] |

| MVS No | MVS Name | Dominant Species Layers | Likely Maximum Overall Fuel Hazard | Significant Fuel Layers |
|---|---|---|---|---|
| 8 | *Eucalyptus* woodlands with a shrubby understorey | *Eucalyptus obliqua, E. baxteri, E. cosmophylla, E. fasciculosa, Banksia marginata, Hakea rostrata, Banksia marginata, Allocasuarina verticillata, A. muelleriana* ssp. *muelleriana, Acacia pycnantha, Exocarpos cupressiformis, Leptospermum myrsinoides, Lepidosperma semiteres, Xanthorrhoea semiplana* ssp. *tateana, Acrotriche serrulata, Olearia ramulosa, Platylobium obtusangulum, Astroloma humifusum, Pultenaea daphnoides, Epacris impressa, Calytrix tetragona* | Extreme | Surface; Elevated; Bark[1] |
| 9 | *Eucalyptus* woodlands with a grassy understorey | *Eucalyptus fasciculosa, E. leucoxylon* spp. *leucoxylon, E. viminalis* ssp. *cygnetensis, Exocarpos cupressiformis, Acacia pycnantha, A. paradoxa, Leptospermum myrsinoides, Spyridium parvifolium, Olearia ramulosa, Gonocarpus mazianus, Pultenaea daphnoides, Calytrix tetragona, *Briza maxima* | Very High | Surface; Bark[1] |
| 21 | Other *Acacia* tall open shrublands and shrublands | *Acacia paradoxa, A. pycnantha, Poa poiformis* var. *poiformis, Goodenia amplexans, Astroloma humifusum, Hibbertia riparia, Pultenaea daphnoides* | High | - |
| 32 | Other shrublands | *Leptospermum continentale, Lepidosperma longitudinale, Olearia ramulosa, Lagurus ovatus, Senecio pinnatifolius, Gonocarpus tetragynus, Calytrix tetragona, Kennedia prostrata* | High | - |

* denotes introduced species
[1] if stringybark present

## 3.5 Extreme Fire Conditions

Strong winds, combined with high temperatures and low humidity provide conditions for moderate to severe fire intensity and fire behaviour, which is unmanageable by suppression activities. There is a dramatic increase in the likelihood of major bushfire events when the following conditions are experienced:

- *Very High* to *Extreme* fuel hazard levels are present in native vegetation;
- Low humidity, decreased soil and fuel moisture, particularly during drought years;
- High winds shifting direction during the course of a fire; and
- Steep terrain.

# 4 FIRE HISTORY AND FIRE REGIMES

## 4.1 Mapping Fire Occurrences

The Fire History map (Map 3) has been compiled from the latest DEH fire incident reports. The map shows the most recent complete firescar by year. The quality of the fire scar mapping varies, depending on the methods of capture, which ranges from the digitising of enlarged aerial photographs to the interpretation of hand drawn maps. It is important to note that only visible fire scars have been mapped. Consequently, the mapped fires may be regarded as a minimum estimate of fire occurrences.

## 4.2 Large Fires

Two large fires have occurred in Deep Creek CP (Map 3). The largest of these occurred in 1980 and burnt nearly 3 000 hectares, including the coastal and central area of the reserve, and an area off-reserve to the north-west. The second fire occurred in 1983 burning around 1,150 hectares, which included most of the eastern end of Deep Creek CP, north of Boat Harbor and a small section of the 1980 firescar.

The 1983 fire started at the coast and due to the level fuel and wind at the time, moved quickly into inaccessible terrain. The conditions during ignition were wind direction of south to south-west at 20 kph, temperature of 20°C and 20% relative humidity. For days after the fire started, conditions were cool and mild, with the fire smouldering through sheltered, steep terrain. Weather conditions became extreme around the tenth day, which resulted in wind direction shifting to north to north-west at 30kph, an average temperature of 36°C and relative humidity of 15-20%. Under these conditions the fire burnt the remainder of the area shown on Map 3.

## 4.3 Natural and Human-caused Fires

The majority of the fires that have occurred in Deep Creek CP since proclamation in 1971, including the two large fires described above, have been attributed to human-caused ignitions (e.g. unattended campfires). Another human-caused fire (80 ha) occurred in the Goondooloo Ridge area in 1990. Fire history indicates that human-caused fires are more likely than fires caused by lightning, as there are records of escapees from campfires and prescribed burns on adjacent private land near Talisker CP. The likelihood of fire ignitions due to unattended campfires is increased during summer, as visitor use and access within the Fishery Beach area (south-west of Talisker CP) is high during this time (Map 1). There have been a number of small (<10 ha) fires caused by lightning in the plan area.

## 4.4 Prescribed Burning/Historical Fires

The Department has not undertaken prescribed burning within any of the reserves in the plan area since their proclamation. Furthermore, no records of bushfire exist for Talisker, Eric Bonython and Waitpinga Conservation Parks since they were proclaimed (1985, 1960 and 1960 respectively). There is anecdotal evidence that previous landholders burnt sections of Deep Creek CP on a relatively frequent basis up until the 1970's (V Scholz, 2005, *pers. comm.*, 28 July). Talisker CP is thought to have some areas of vegetation long unburnt (120 years), while other areas were cleared for use in the nearby mines (V Scholz, 2005, *pers. comm.*, 28 July).

# 5 DAMAGE POTENTIAL TO LIFE AND PROPERTY

## 5.1 Land Use

Areas adjoining the reserves have a mixture of land uses including: rural residential, native vegetation conserved under Heritage Agreements, grazing farmland, blue gum and pine plantations, a plant nursery, cropping and agriculture (Map 1). There are some areas of native vegetation contiguous with Deep Creek CP however the majority of the landscape outside the reserve in this area is fragmented, having been cleared for agriculture and forestry.

All landholders are obliged to comply with the *Fire and Emergency Services Act 2005*, which outlines responsibilities for fire preparedness. DEH will implement works for fire management on DEH managed lands within the plan area, however adjoining landholders are also required to implement works on their own property to minimise the threat of fire.

It is recommended that DEH should:

**Land Use**

1. Implement fuel management strategies on DEH managed lands to minimise the risk to life, property and the environment (refer to Section 11 and Map 4 for further information).

## 5.2 Built Assets

There are numerous on-reserve built assets at risk from bushfires including:

- Tourist accommodation (Southern Ocean Retreats) at Deep Creek CP:
  - Ridgetop Retreats;
  - Deep Creek Homestead;
  - Glenburn Cottage; and
  - Goondooloo Cottage.
- DEH built assets include:
  - Park headquarters;
  - Residences;
  - Workshop; and
  - Visitor facilities and infrastructure associated with walking trails, picnic areas and campgrounds.
- Campgrounds located at:
  - Stringybark;
  - Eagle Waterhole (hike in only);
  - Trig;
  - Cobbler Hill; and
  - Tapanappa.

There are numerous off-reserve assets at risk from bushfires including:

- Pine and blue gum plantations adjacent or in close proximity to the reserves, representing a significant capital asset;

- Private homes, sheds, dwellings scattered around the reserves, including the township of Silverton (adjacent Talisker CP) which now has a combined population of permanent residents and holidaymakers;
- Taldahari student camp (approximately 600 m from western side of Talisker CP);
- Raywood Nursery (near Tapanappa Road);
- Surrounding farms.

It is recommended that DEH should:

**Built Assets**

2. Undertake fire management works and activities on DEH reserves to minimise the impact that fire may pose to adjacent public assets.
3. Encourage adjacent property owners to comply with the *Fire and Emergency Services Act 2005* by implementing fire management works on their own land to minimise the threat of fire.
4. Implement fuel management strategies appropriate to asset protection (refer to Section 11 and Map 4 for further information).
5. Encourage volunteer participation in undertaking approved fuel reduction activities.

## 5.3 Visitor Use

Deep Creek CP is popular for bushwalking and camping with the Heysen Trail being one of many trails that traverse the reserve. Of the four reserves covered in this Fire Management Plan, Deep Creek CP has the highest recorded visitor numbers however this number will vary throughout the year. Up to 1 000 people per month camp in Deep Creek CP during the fire danger season (taken from 2002 data (V Scholz, 2006, *pers. comm.*, 4 May). Day visitors to the reserve are in addition to these figures. Talisker, Waitpinga and Eric Bonython Conservation Parks receive very few visitors.

Visitor use and access has been considered during the development of fire management strategies to minimise the likelihood of fire impacting on or originating from high visitor use areas, or endangering visitors.

It is recommended that DEH should:

**Visitor Use**

6. Implement fuel management strategies appropriate to visitor safety (refer to Section 11 (Block Prescriptions) and Map 4 for further information).

7. Consider reserve closures (at the discretion of the Director National Parks) and develop an Emergency Action Plan to address visitor safety during bushfires and on days of extreme fire weather. In particular this should address:
   - visitor safety during bushfire incidents;
   - visitor safety on *High* to *Extreme* fire danger days, especially within campgrounds, day use areas, accommodation and on walking trails;
   - an exemption for Southern Ocean Retreats from reserve closures on days of extreme fire weather, providing that they provide guests with a Bushfire Action Plan, and that this plan is sighted and endorsed annually by the District. Under this arrangement guests will be restricted to the accommodation unless approved by the District Ranger, Fleurieu.

## 5.4 Heritage Values

Silver-lead mining was in operation in Talisker CP from 1862 to 1872. Heritage-listed ruins associated with the mine are a tourist attraction. Fire poses a risk to these ruins, as they are constructed of stone and wood and they should be protected in the event of a fire. Heritage-listed buildings are also present within the associated mining township of Silverton.

The plan area crosses over two cultural boundaries of the Kaurna and Ramindjeri groups (Tindale 1974). Stone chipping and midden cultural sites have been located within Deep Creek CP (DENR 1997). Although fire may not have a direct impact on these sites, suppression strategies should take these sites into consideration so any likely impact or damage is avoided. In carrying out this plan DEH will comply with the *Aboriginal Heritage Act 1988* and the *Aboriginal Heritage Handbook and Strategy* (DEH 2006a).

It is recommended that DEH should:

**Heritage Values**

8. Implement fuel management strategies for the protection of heritage values where practicable (refer to Section 11 (Block Prescriptions) and Map 4 for further information);

9. Ensure liaison at bushfires occurs to identify heritage values, where time allows. Once the fire has passed evaluate sites to establish if any damage has occurred;

10. Ensure suppression strategies take into account significant historical sites in order to minimise impacts from these activities and undertake post-fire rehabilitation.

# 6 SPECIES AND COMMUNITIES OF CONSERVATION SIGNIFICANCE

Major Vegetation Sub-groups occurring within the plan area are outlined in the following section, followed by the flora and fauna of conservation significance. Although there are many State rated species within the plan area (included in Appendix 1 and 2), the species and communities that are specifically discussed are those that are Nationally rated and have a Recovery Plan prepared or in draft stage.

## 6.1 Major Vegetation Sub-groups (MVS)

Floristic mapping for this plan uses a compilation of regional vegetation mapping data that has been reclassified to comply with the National Vegetation Information System (NVIS) classification for Australia. The MVS level of the NVIS classification emphasises the structural and floristic composition of the dominant stratum but with additional types identified according to typical shrub or ground layers occurring with a dominant tree or shrub stratum. There are five MVS within the plan area that have been mapped by DEH. Refer to Map 2 for an overview. Refer to Table 1 (Section 3.4.2) for a detailed description of the species composition.

The Major Vegetation Sub-groups represented in the plan area are described below.

- *Eucalyptus* forests with a shrubby understorey (MVS No. 4);
- *Eucalyptus* woodlands with a shrubby understorey (MVS No. 8);
- *Eucalyptus* woodlands with a grassy understorey (MVS No. 9);
- Other *Acacia* tall open shrublands and shrublands (MVS No. 21);
- Other shrublands (MVS No. 32).

Pink Gum woodland dominates Waitpinga CP as well as the southern section of Deep Creek CP (MVS No. 9). The woodland is extremely dense across this section Deep Creek CP and typically has *Extreme* elevated fuels. Messmate Stringybark woodlands and forests are present across the central and northern sections of Deep Creek CP (MVS No. 4 and 8). This carries a *Very High* to *Extreme* bark hazard. A mixed *Eucalyptus* woodland of Messmate Stringybark and Cup Gum (*E. cosmophylla*) dominates the far eastern section of Deep Creek CP (MVS No. 8). Talisker and Eric Bonython Conservation Parks are dominated by a Messmate Stringybark forest (MVS No. 4).

## 6.2 Flora, Fauna and Ecological Communities

The Environmental Database of South Australia contains records from several data sources including the Threatened Plant Population Database, the Biological Survey of South Australia, Reserve database and Opportunistic sightings of significant flora and fauna.

Fire response information, where known, is included for these species and communities of conservation significance in Appendix 1, 2 and 3. In most cases, their distributions are derived from the database, which only contains point locations from site visits or observations.

In this plan *'of conservation significance'* is used to describe important or 'rated' populations or species of animals, plants or birds, and vegetation communities. Species and communities may be:

- Nationally rated, that is, listed as threatened (with a rating of Critically Endangered, Endangered, Vulnerable or Conservation Dependent) under the federal *Environment Protection and Biodiversity Conservation (EPBC) Act 1999;*
- South Australian rated, listed as Threatened (with a rating of Endangered, Vulnerable or Rare) under the NPW Act, *Revised Schedules 7, 8* and *9.*

Three flora, three fauna and one ecological community that are of National conservation significance occur within the plan area. A number of flora and fauna species of State conservation significance also occur in the plan area. Refer to Appendix 1, 2 and 3. The most significant in terms of this plan include:

- Swamps of the Fleurieu Peninsula - Nationally *Critically Endangered.*
- MLR Southern Emu-wren - Nationally *Endangered.*
- MLR Chestnut-rumped Heathwren – Nationally *Endangered.*
- Southern Brown Bandicoot - Nationally *Endangered*.

### *6.2.1 Swamps of the Fleurieu Peninsula*

#### Description

The Swamps of the Fleurieu Peninsula (referred to as 'Swamps' herein) are localised wetlands, typically densely vegetated, occurring adjacent waterlogged soils, such as low-lying creeks, gullies and flats. The vegetation tends to be reedy and heathy, growing on peat, silt or black clay soils (DEH (Cwlth) 2003b). The Swamps contain unique flora and fauna, some of which are listed as *Endangered* Nationally and are not found elsewhere in Australia, such as the MLR Southern Emu-wren (DEH (Cwlth) 2003b).

#### Conservation Status

The Swamps of the Fleurieu Peninsula are listed Nationally as *Critically Endangered*. A Recovery Team exists for the Swamps and a Recovery Statement has been prepared (MLRSEW & FPS Recovery Team 2007c).

#### Distribution

The Swamps occur in both Deep Creek and Waitpinga Conservation Parks, in addition to other areas off-reserve around the lower Fleurieu Peninsula (Map 2).

#### Threats/Risk

The Recovery Statement lists bushfire as a significant threat (MLRSEW & FPS Recovery Team 2007c). Bushfires that affect a significant proportion of Swamps, or those that occur in Swamps supporting slow growing species with limited dispersal abilities, are considered to be the most threatening. Specific information on how these Swamp communities may respond to fire is included in Appendix 3.

It is recommended that DEH should:

**Swamps of the Fleurieu Peninsula**

11. Aim to minimise the impact of fire on Swamps, particularly the impact of high frequency fires or high intensity fires, in line with the Recovery Statement for the Swamps of the Fleurieu Peninsula (MLRSEW & FPS Recovery Team 2007c).
12. Liaise with the MLR Southern Emu-wren and Swamps of the Fleurieu Peninsula Recovery Team when planning prescribed burns in Swamp areas.
13. Use information provided by the Recovery Team during emergency situations. The Recovery Team should ensure information relating to distribution, abundance and significance of the Swamps is easily accessible and in a format suitable for use by an Incident Management Team (IMT).
14. Refer to the booklet Protecting Fleurieu Peninsula Swamps and the MLR Southern Emu-wren - A Guide for Landowners, Land Advisers, Property Planners and Developers (MLRSEW & FPS Recovery Team 2007a) for more information.

### *6.2.2 MLR Southern Emu-wren*

**Description**

The MLR Southern Emu-wren is a small passerine, one of eight subspecies of the Southern Emu-wren *(Stipiturus malachurus)*. Its breeding season spans from August to the end of March (including nesting and the rearing of young), with most young hatching during September to December (MLRSEW & FPS Recovery Team 2007b). The species forages for small invertebrates in the shrub layer or occasionally on the ground. Specific information on the species life history and fire response is included in Appendix 2.

**Conservation Status**

The MLR Southern Emu-wren is listed as *Endangered* under the EPBC Act and also the NPW Act. A Recovery Program for the MLR Southern Emu-wren has been in place since 1995, with coordinated site surveys, population census, monitoring and threat abatement across its range.

**Habitat Requirements**

In Deep Creek CP, key habitat for the species is considered to be dense dry heath of up to one metre in height. The species also occurs within swamps, however in Deep Creek CP most of the swamps are not considered suitable breeding habitat for the species. Preferred Swamp habitat occurs mainly on private land (MLRSEW & FPS Recovery Team 2007b) and this is characterised by tea-tree bushes, grasses, sedges and ferns (DEH (Cwlth) 2003a).

The MLR Southern Emu-wren and Swamps of Fleurieu Peninsula Recovery Team considers the Boat Harbor area (in the eastern section of Deep Creek CP) (Map 2) the most significant site for the species within the reserve. The central area around Deep Creek is also considered important. These two areas of the reserve, along with the Finniss Park Swamps to the north-east of Deep Creek CP support almost the entire population of the MLR Southern Emu-wren (MLRSEW & FPS Recovery Team 2007b).

**Distribution**

There are numerous records of MLR Southern Emu-wrens within Deep Creek CP (Map 2). It should be noted that the MLR Southern Emu-wren data shown on Map 2 is indicative of occurrences over recent surveys and may not represent the full extent of the species (M Pickett, 2005, *pers. comm.*, 16 June).

**Threats/Risk**

Bushfire and vegetation clearance are considered by the MLR Southern Emu-wren and Swamps of Fleurieu Peninsula Recovery Team (2007b) among some of the major threats to the MLR Southern Emu-wren population. The likely impacts to the species due to bushfire are:

- habitat degradation, loss and/or fragmentation;
- the loss of productivity;
- reduced adult survival;
- forced dispersal.

The likely impacts to the species due to vegetation clearance (e.g. for fuel reduction) are:

- habitat degradation, loss or fragmentation;
- forced dispersal.

The Recovery Team has identified that most of the Deep Creek CP population could be lost in a single bushfire event (MLRSEW & FPS Recovery Team 2007b). As part of the fire management planning process, DEH have assessed the risk of bushfire impacting on the persistence of the species and its habitat within the planning area as *Extreme*.

Within Deep Creek CP bushfires occurred in both of these MLR Southern Emu-wren habitats in the 1980s (Map 3). Recolonisation of the sites occurred post-fire and although the sites are not connected, it is thought that dispersal was supported by the adjoining unburnt dry-heath areas, as well as in-situ refugia (M Pickett, 2007, *pers. comm.*, 4 January).

**Management Requirements**

The MLR Southern Emu-wren and Swamps of Fleurieu Peninsula Recovery Team supports the use of small scale prescribed burns in Deep Creek CP to provide further information and understanding of how fire influences the MLR Southern Emu-wren population and its habitat (M Pickett, 2005, *pers. comm.*, 16 June). In order to avoid the species breeding season (spring to early summer), any prescribed burn for this purpose should be conducted in autumn to early winter. The maintenance of structural and floristic integrity in connective areas (corridors) of native vegetation within and on the boundaries of Deep Creek CP is vital so linkages to populations are maintained. When implementing prescribed burns or carrying out suppression operations within known and potential habitat (typically dense shrub/sedge ground/mid layers), or between areas of occupancy, managers need to consider the possible impacts on the species.

The most significant areas for Southern Emu-wren dispersal are:

- the northern end of Boat Harbour Block (vicinity of Tapanappa Road); and
- the southern end of Krichauff Block and northern end of Florence/Glenburn Block (vicinity of Tapanappa Road and Ridgetop Retreats)

It is recommended that DEH should:

**MLR Southern Emu-wren**

15. Implement strategically located prescribed burns in order to create low fuel buffers that aim to mitigate against major population losses by providing potential refuge areas and minimising the likelihood of bushfire encroaching into core population areas.
16. Use prescribed burning as an opportunity to gather new information on the fire response of the species as well as assess the proposed Ecological Fire Management Guidelines (Appendix 2). Refer to Section 10 for details on recommended research and monitoring.
17. Conduct prescribed burning to increase habitat patchiness.
18. Consult the MLR Southern Emu-wren and Swamps of Fleurieu Peninsula Recovery Team during the planning of any burn to be conducted within the known habitat of the MLR Southern Emu-wren (details on possible areas for consideration are indicated in Section 11 - Block Prescriptions).
19. Develop an Ecological Fire Management Strategy for the species.
20. Refer to the booklet Protecting Fleurieu Peninsula Swamps and the MLR Southern Emu-wren - A Guide for Landowners, Land Advisers, Property Planners and Developers (MLRSEW & FPS Recovery Team 2007a) for more information.

### *6.2.3 MLR Chestnut-rumped Heathwren*

**Description**

The MLR Chestnut-rumped Heathwren is one of three sub-species found in South Australia (TSSC 2005). It is a sedentary species that prefers to remain in the cover of vegetation. The species forages under cover on the ground taking mainly insects and sometimes spiders and seeds (Pickett 2007). The breeding season extends from June through to December (Pickett 2007) and the species typically builds domed shaped nest on or near the ground (TSSC 2005). Specific information on how the MLR Chestnut-rumped Heathwren responds to fire is detailed in Appendix 2.

**Conservation Status**

The MLR Chestnut-rumped Heathwren is listed as *Endangered* at the National level and *Vulnerable* at the State level. No Recovery Team currently exists for this species, however DEH currently contribute to the coordination of surveys and planning.

**Habitat Requirements**

The species inhabits dense heathlands and sclerophyllous *Eucalyptus* woodlands with a dense heathy understorey (MVS No. 4 and 9 in the plan area) (Pickett 2007). Key habitat requirements are considered to be low dense vegetation, with areas of rocky ground or rocky outcrops (Pickett 2007).

**Distribution**

The MLR Chestnut-rumped Heathwren is endemic to the Mount Lofty Ranges in South Australia (TSSC 2005). The species has been recorded across the south coast of the Fleurieu Peninsula from Cape Jervis in the south-west through to Encounter Bay (near Victor Harbor) in the south-east, with a distribution gap in the Inman Valley region (Pickett 2007). The species has also been recorded through the central Mount Lofty Ranges as far north as Kaiser Stuhl CP (Pickett 2007). Within the plan area, there are species records within Deep Creek and Waitpinga Conservation Parks.

**Threats/Risk**

The MLR Chestnut-rumped Heathwren is considered to be threatened by inappropriate fire regime (TSSC 2005). It is a fire sensitive species and fire is likely to influence the abundance of preferred food sources, availability of shelter sites and nesting materials, limit the dispersal capabilities of the species and contribute to population isolation (Pickett 2007). However there is evidence that fire may not be as great a threat as once thought, as the species successfully recolonised Cox Scrub CP after a fire burnt the reserve in its entirety in 1983 (Garnett and Crowley 2000). DEH has assessed the risk of bushfire impacting on the persistence of the species and preferred habitat as *Extreme*.

Management Requirements There is evidence that this species may be an early successional coloniser of burnt woodland and heathy vegetation, therefore may rely on patchiness within remaining habitats (Pickett 2007). Refer to Appendix 2 for ecological fire management guidelines.

It is recommended that DEH should:

**MLR Chestnut-rumped Heathwren**

21. Implement strategically located prescribed burns to create low fuel buffers in order to minimise the risk of large contiguous areas of habitat burning in one fire event.
22. Attempt to retain some unburnt patches as refuge areas during prescribed burning and also during bushfire suppression.
23. Conduct prescribed burning to increase habitat patchiness.
24. Consult the MLR Southern Emu-wren and Swamps of Fleurieu Peninsula Recovery Team during the planning of any burn to be conducted within the known habitat of the MLR Southern Emu-wren (details on possible areas for consideration are indicated in Section 11 - Block Prescriptions).
25. Use prescribed burning as an opportunity to gather new information on the fire response of the species as well as assess the proposed Ecological Fire Management Guidelines (Appendix 2). Refer to Section 10 for details on recommended research and monitoring. .
26. Consult with the DEH threatened species unit when planning burns in known habitat of the MLR Chestnut-rumped Heathwren.

### *6.2.4 Southern Brown Bandicoot*

#### Description

The Southern Brown Bandicoot is the last remaining species of bandicoot occurring naturally in South Australia. It is a marsupial, weighing up to 850 grams with a long snout, small round ears, a short tail and large rump (DEH 2006b). The Southern Brown Bandicoot is a omnivorous ground-dweller that forages for food under leaf litter and in the soil, consuming invertebrates, fungi, fruits and other plant material (DEH 2006b). Individual bandicoots have a home range varying from one to six hectares and reproduce between late winter and summer (DEH 2006b). They construct nests consisting of leaf litter and soil (DEH 2006b).

#### Conservation Status

The Southern Brown Bandicoot is listed *Endangered* at the National level and *Vulnerable* in South Australia. A Recovery Plan has been prepared for the species, which is aimed at maintaining or increasing the distribution and abundance of the Southern Brown Bandicoot in the Mount Lofty Ranges (Haby and Long 2005)

#### Habitat Requirements

Southern Brown Bandicoots can occupy a variety of structural vegetation communities including sclerophyllous forest, woodland, shrubland and heathland. Pivotal to their habitat choice is the presence of a dense heathy or shrubby understorey up to one metre in height (DEH 2006b). Nesting sites are likely to be associated with species such as Yaccas (*Xanthorrhoea semiplana)* and Wire Rapier-sedge (*Lepidosperma semiteres*) (Haby and Long 2005).

#### Distribution

Southern Brown Bandicoot records for the plan area are displayed on Map 2. It should be noted that the paucity of records is more a reflection of the cryptic behaviour of the species and the limited survey effort expended in the area rather than of the species' true distribution. Given the extent of suitable habitat in the area, particularly within Deep Creek CP, bandicoots are probably relatively widespread (K Long, 2006, *pers. comm.*, 6 March).

#### Threats/Risk

The *Recovery Plan for the Southern Brown Bandicoot in the Mount Lofty Ranges* advocates the development and implementation of Fire Management Plans that minimise the likelihood of bushfires burning entire habitat patches, as well as the implementation of monitoring programs to determine the effect of fire management regimes on Southern Brown Bandicoot populations (Haby and Long 2005).

DEH has assessed the risk of bushfire impacting the population and habitat of the species as *Extreme*.

#### Management Requirements

The MLR Southern Brown Bandicoot Recovery Team supports the use of prescribed burns where they assist in achieving recovery actions. Knowledge of the short and long-term impacts of fire on Southern Brown Bandicoots is incomplete; therefore providing a mosaic of post-fire stages is desirable. In fragmented habitats, like the Mount Lofty Ranges, there is also an increased risk of localised extinction if a fire burns an entire habitat patch (Haby and Long 2005).

Fuel-reduced areas (i.e. Overall Fuel Hazard less than *High*) are predicted to burn with a lower intensity and burn less thoroughly (especially under milder conditions), which possibly provides some refuge areas in the event of large bushfire. Areas of *High* to *Extreme* Overall Fuel Hazard will burn with higher intensity and are therefore likely to increase the risk of local bandicoot extinction as unburnt remnants are unlikely to remain for refuge.

Specific information on how the Southern Brown Bandicoot responds to fire is included in Appendix 2.

It is recommended that DEH should:

**Southern Brown Bandicoot**

27. Implement strategically located prescribed burns to create low fuel buffers in order to minimise the likelihood of contiguous areas of habitat burning in one fire event.
28. Attempt to retain some unburnt patches as refuge areas during prescribed burning and also during bushfire suppression.
29. Conduct prescribed burning to increase habitat patchiness.
30. Use prescribed burning as an opportunity to gather new information on the fire response of the species as well as assess the proposed Ecological Fire Management Guidelines (Appendix 2). Refer to Section 10 for details on recommended research and monitoring.
31. Develop an Ecological Fire Management Strategy for the species.
32. Consult the Southern Brown Bandicoot Recovery Team when planning prescribed burns in known bandicoot habitat.

# 7 ECOLOGICAL FIRE MANAGEMENT

The management of fire to maintain biodiversity is discussed in more detail in the Draft DEH *Guidelines for Ecological Fire Management* (DEH 2006c) This approach is being used as a sound basis for the management of fire for biodiversity across Australia (FEWG 2004; Hopkins and Saunders 1987; Whelan *et al.* 2002). It is based on accumulating knowledge of species, populations and communities and their response to fire regimes, and then applying this knowledge to fire management practices to maximise biodiversity outcomes. Ecological Fire Management Guidelines are used to assist in achieving management objectives in C-zones within all DEH Fire Management Plans. For more information on C-zones refer to Section 8.5 of this Fire Management Plan.

## 7.1 Fire Regimes for Biodiversity Conservation

Fire regime is described as the history of fire in a particular vegetation type or area including the fire frequency, interval, intensity, extent and seasonality of burning (Brooks *et al.* 2004). It is therefore assumed that avoiding adverse fire regimes across the majority of the habitat for any given species should minimise the risk of adverse impacts or local extinction. That is, an adverse fire regime confined to a minor proportion of the habitat of any particular species may influence local distribution, but will have little effect on the persistence of that species across the landscape. A range of different fire intensities, frequencies, seasons and scales of burning need to be incorporated into ecologically based regimes if they are to result in the conservation of biodiversity.

## 7.2 Development of Ecological Fire Management Guidelines

### Vital Attributes

Ecological fire management guidelines for an area will be developed from knowledge of the life histories (vital attributes) of the flora and fauna species that inhabit that particular area. The vital attributes of a species are the characteristics which affect its persistence at a site after fire, the environmental conditions required for re-establishment, and the longevity of the species following disturbance (Noble and Slatyer 1981). For fauna, these vital attributes are the habitat and life history characteristics: shelter, food, and breeding requirements of species (Friend and Williams 1996).

### Key Fire Response Species

Examination of vital attributes of the species present in a particular area assists in defining the *Key Fire Response Species* for a particular community or vegetation type. These are the species most susceptible to decline due to inappropriate fire regimes: either too frequent or too infrequent fire, low or very high intensity fire, or fire in a particular season. These species and their needs in relation to fire regime provide a guide to the acceptable thresholds of fire regime (interval, season or intensity) for that particular area.

### Methodology

Ecological Fire Management Guidelines have been developed from the research and analysis of available data relating to the *Key Fire Response Species* within the Reserves of the South-western Fleurieu Peninsula. The approach used by DEH to define the Ecological Fire Management Guidelines involves the identification of fire regime thresholds using flora and the assessment of the potential impacts of these thresholds against known faunal

requirements, particularly the requirements of species of conservation significance. The steps taken in the development of the Ecological Fire Management Guidelines are as follows:

- Vital attributes data of plant and animal species, and ecological communities are gathered and assessed.
- This knowledge is used to identify the Thresholds of Potential Concern (TPC) of fire regime (fire interval, intensity, season & type) where species significantly decrease.
- Ecological Fire Management Guidelines are formed from these thresholds and are then used to guide the fire management practices to ensure that adequate habitat is available to maintain biodiversity (i.e. species, populations & communities) (Section 7.3).

Figure 3 (below) illustrates this process.

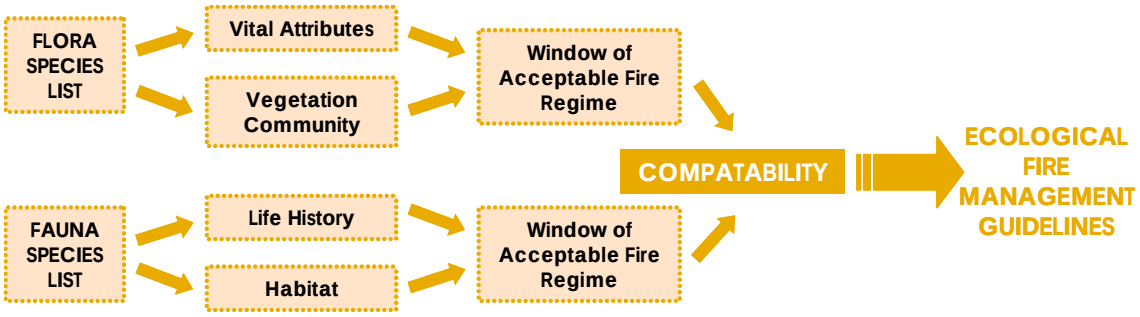



**FIGURE 3 – APPROACH FOR DETERMINING ECOLOGICAL FIRE MANAGEMENT GUIDELINES**

Adapted from (DEH 2006c)

## 7.3 Interpreting Ecological Fire Management Guidelines

Ecological Fire Management Guidelines have been defined for Major Vegetation Sub-groups (MVS), enabling fire management to strategically plan and manage fire across the Reserves of the South-western Fleurieu Peninsula in a way that will ensure the maintenance and enhancement of biodiversity (Table 2). Guidelines for five aspects of fire regime (interval, frequency, spatial, intensity and season) have been determined for all MVS within the planning area (where data is available). The upper and lower limits of fire interval for a particular MVS have been proposed, as well as recommendations on the management of fire frequency. Fire intensity requirements for species regeneration and undesired seasonal burning patterns have also been identified. Ecological Fire Management Guidelines should not be used as prescriptions; instead they define a window of "acceptable" fire regime that ensures the conservation of existing species.

**TABLE 2 – ECOLOGICAL FIRE MANAGEMENT GUIDELINES FOR MVS IN THE PLAN AREA**

| | | FIRE REGIME | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Thresholds of Potential Concern (TPC) | | Spatial Criteria | Frequency | | Intensity | Season |
| MVS No | MVS Name | **TPC1 –** Lower threshold in years | **TPC2 –** Upper threshold in years | Inter-fire intervals within **TPC1** & **TPC2** across more than *X*% of the extent of this MVS within the planning area 1 | Avoid more than 2 fires within a period of X years | Avoid 3 or more successive fires of low intensity | Some medium to high intensity fire needed to regenerate some species | Avoid 2 or more successive fires in *season* |
| **4** | *Eucalyptus* forests with a shrubby understorey | 20 | 35 | 50% | 40 | Y | Y | Spring |
| **8** | *Eucalyptus* woodlands with a shrubby understorey | 20 | 35 | 50% | 40 | Y | Y | Spring |
| **9** | *Eucalyptus* woodlands with a grassy understorey | 20 | 25 | 50% | 40 | Y | Y | Spring |
| **21** | Other *Acacia* tall open shrublands and shrublands | 20 | 40 | 50% | 40 | Y | Y | Dry |
| **32** | Other shrublands | 20 | 35 | 50% | 40 | # | # | # |

*# Denotes that fire response is unknown or ambiguous for this MVS thus the required data is not available to propose Ecological Fire Management Guidelines. When data becomes available this table will be updated.*

[1] *Fire interval should be managed to ensure that it is within the Ecological Fire Management Guidelines across greater than 50% of the extent of each MVS within the plan area.*

**Threshold of Potential Concern**

The *Threshold of Potential Concern* (TPC) for a vegetation type or community is the level of fire regime element (i.e. fire interval, frequency, intensity or season) where *Key Fire Response Species* are likely to significantly decline if exceeded. Fire regimes beyond that level are likely to lead to local extinction of significant biodiversity.

- TPC1 demonstrates the recommended lower limit for fire interval for a particular MVS. That is, vegetation within this MVS will be represented predominantly by early successional species if the inter-fire interval is less than the time specified, and those species that require longer to flower and set seed can disappear from a community.

- TPC2 demonstrates the recommended upper limit for fire interval for a particular MVS. That is, populations of some species (e.g. obligate seeders) are likely to reduce within this MVS if fire is absent for more than the time specified.

**Ecological Fire Management in the Reserves of the South-west Fleurieu Peninsula**

As illustrated in Table 2 the recommended minimum fire interval has been defined as 20 years across 50% of the total of each MVS within the planning area. However, the upper limit varies from 25 to 40 years across 50% of the total of each MVS within the planning area. It was determined that it may be undesirable to subject any of the MVS within the planning area to two or more successive fires of less than 40 years apart. Furthermore, three or more successive fires of low intensity are likely to impact MVS No. 4, 8, 9 and 21. Fire intensity requirements for species regeneration suggest that MVS No. 4, 8, 9 and 21 require some medium to high intensity fire to regenerate a number of species. Undesired seasonal burning patterns have also been identified where the data is available, with spring burning likely to impact MVS No. 4, 8 and 9 whereas burning during dry conditions is likely to impact MVS No. 21.

## 7.4 Weeds

Weeds can have significant impacts on native vegetation and ecological communities within reserves (Saunders *et al.* 1991). Disturbance (e.g. grazing, nutrient inputs, erosion, fragmentation) is likely to promote weed invasion, and fire in areas already affected by one or more of these disturbance mechanisms is likely to lead to weed proliferation (Hobbs 1991; Hobbs 2002; Hobbs and Huenneke 1992). It is well known that disturbance, especially fire, is an important mechanism in natural systems (Hobbs and Huenneke 1992).

The weeds of main concern in the plan area are Gorse (*Ulex europaeus*), English Broom (*Cytisus scoparius*), Bridal Creeper *(Asparagus asparagoides)* and Blackberry (*Rubus fruticosus*). Fire management guidelines for these species are included in Appendix 1. There is a long-term weed management program in place and this has dramatically reduced the size of infestations of Blackberry and Gorse in the plan area.

All prescribed burns conducted by DEH will assess weed control measures in the Environmental Assessment Table (EAT), completed as a requirement of the prescribed burn planning process (DEH 2004; 2006k). The EAT will describe the weed control to be implemented post-burn, however investment will be based on the reserves overall habitat quality and also management priorities within the region.

Fire has been accepted as a tool for weed management, prescribed as part of an integrated approach (Hobbs 2003). An integrated approach to weed management involves the planned use of fire coupled with other weed control techniques (including herbicide, biological, mechanical and physical control) noting that the combination, timing and application of methods is likely to differ depending on the target species.

It is recommended that DEH should:

| | |
|---|---|
| Weeds | 33. Refer to Ecological Fire Management Guidelines (Table 2 - Section 7.3) and fire management guidelines for introduced flora species (Appendix 1) during prescribed burn planning. |
| | 34. Consider the use of fire as part of an integrated weed management strategy. |
| | 35. Conduct post-fire weed control subject to regional priorities. |
| | 36. Identify the potential impact of weed species prior to any prescribed burn in prescribed burn panning, as part of the EAT. This will identify any priority weed species and recommend post-fire actions to mitigate the impact of weeds. |
| | 37. Monitor weeds pre- and post-fire to determine what post-fire weed control is required and its effectiveness. |
| | 38. Ensure hygiene practices are implemented to reduce weed spread across the plan area. |

## 7.5 Pest Animals

The conditions that result following a fire can be favourable to some fauna species, but for other species these conditions may result in population decline. There is evidence that introduced fauna can flourish in the conditions existing after a fire. Herbivores, such as the introduced Rabbit *(Oryctolagus cuniculus)* and native Kangaroos *(Macropus* sp.) can benefit from the post-fire regeneration, finding suitable food within the recently burnt area (Gill and Catling 2002; Murphy and Bowman 2007). Predation on small mammals (such as the Southern Brown Bandicoot) and birds by Foxes *(Vulpes vulpes)* may increase post-fire due to the reduction in shelter sites or cover and the increased access a fire provides (Gill and Catling 2002). The degree of impact by these species post-fire depends on a number of factors, including the pre-fire abundance of the species and characteristics of the fire (e.g. fire size, shape, season, intensity and location).

Within the Reserves of the South-western Fleurieu Peninsula, a number of introduced species have been observed. These include the Rabbit, Cat *(Felis catus)*, Fallow Deer *(Dama dama)* and Fox (DENR 1997).

It is important that the information collected on introduced fauna pre-fire is used to determine appropriate management post-fire. There is the opportunity to increase the rate of eradication programs for introduced fauna after fire, to take advantage of the reduced vegetation cover and/or possible concentration of fauna in a smaller area.

It is recommended that DEH should:

| | |
|---|---|
| Pest Fauna | 39. Collect relevant information in prescribed burn planning as part of the EAT on introduced fauna, to determine appropriate management post-fire. |

## 7.6 Plant Pathogens

The *Environment Protection and Biodiversity Conservation Act 1999* has identified Phytophthora *(Phytophthora cinnamomi)* as a key threatening process, which means that it is a major threat to native vegetation and associated fauna, particularly threatened species. Phytophthora is a soil and waterborne fungus that causes disease and death to a variety of native plant species, as well as introduced species. It occurs in areas of high rainfall and because of this, the reserves in the plan area have been identified as being particularly at risk. Phytophthora has been identified and confirmed by soil testing within the plan area, within both Deep Creek and Waitpinga Conservation Parks. Phytophthora symptoms have also been reported in Talisker CP, however no testing has been carried out to date. No Phytophthora symptoms within Eric Bonython CP have been reported to DEH. The fungus can spread through mud carried on vehicle tyres, walking boots and equipment, so there is significant risk of this occurring throughout the plan area.

DEH has a Standard Operating Procedure, which addresses Phytophthora threat management (DEH 2002a). This outlines hygiene procedures and guidelines to protect the integrity of natural areas by minimising the risk of Phytophthora infestation and spread in DEH reserves.

It is recommended that DEH should:

**Plant Pathogens**

40. Ensure the *Standard Operating Procedure – Phytophthora Threat Management* (SOP-002) (DEH 2002a) is adhered to in Phytophthora risk areas, which includes all the reserves in the plan area.

41. Ensure hygiene practices are implemented to reduce the spread of Phytophthora across the plan area. Refer to the *DEH Operating Procedure - Phytophthora Vehicle Disinfection Units* (DEH 2003).

# 8 FIRE MANAGEMENT ZONES

## 8.1 Zoning Background

Fire management zones, as detailed in the *Policy and Procedure for Fire Management Zoning in DEH Fire Planning* (DEH 2006j) have been introduced into DEH fire management planning to:

- ensure that appropriate management actions are implemented to meet requirements for asset protection and ecological management on DEH managed land;
- clarify the areas where different fire management activities will be undertaken on DEH managed land;
- ensure a standard approach to the application of fire management zones on DEH managed land across South Australia; and
- assist in the development of Fire Management Plans and programs for DEH managed land.

Fire management zones are categorised according to the primary objective for fire management – Asset Zone (A-zone), Buffer Zone (B-zone) or Conservation Zone (C-zone). These zones were determined, giving consideration to fuel hazard levels in different habitat types and the level of risk to assets including life, property and cultural heritage and biodiversity assets (DEH 2006j). The zones allocated to the planning area are described in Section 11 and also displayed on Map 4.

Details on fuel reduction methods within A- and B-zones are provided within the EAT (as part of prescribed burn planning), which is prepared before the implementation of each prescribed burn and also before fire management works are undertaken within DEH managed land. The EAT is required where native vegetation is being cleared and is not exempt under the *Native Vegetation Act 1991*. Refer to the *Interim Environmental Assessment Table Guidelines* (DEH 2004) and the *Policy and Procedure for Prescribed Burning* (DEH 2006k) for more information.

## 8.2 Risk Assessment

A risk assessment was conducted in line with the *Policy and Procedures for Risk Assessment in DEH Fire Planning* (DEH 2006l) as a requirement of the compilation of this Fire Management Plan. The risk assessment is a tool used to gauge the risks arising from bushfire to life, property and environmental values, within and adjacent to the reserves in the plan area. The risk assessment considered visitor use, assets (built, heritage and environmental) and neighbouring properties for all reserves in the plan area. Risk assessment is a function of likelihood and consequence.

- Likelihood considers the possibility that a fire related risk will occur and is assessed on a basis of *Rare* to *Almost Certain (Rare, Unlikely, Possible, Likely, Almost Certain).*
- Consequence considers bushfire risk based on impacts to life, property and environmental values and is ranked from *Insignificant* to *Critical (Insignificant, Minor, Moderate, Major, Critical)*.

- Based on the derived likelihood and consequence ratings, the overall risk for each scenario is determined using a Risk Matrix and ranked from *Low* to *Extreme (Low, Moderate, High, Extreme).*

Risk assessment is ongoing and continually reviewed to reflect the changing landscape. The application of fire management zones as well as recommended actions and works in this plan are derived from the risk assessment process.

## 8.3 Asset Zone (A-zone)

### A-zone Description

An Asset Zone, or A-zone, as explained by DEH (2006j), aims to provide the highest level of protection to human life and property by implementing the most intensive fuel management strategies. A-zones will mainly be used in reserve areas adjacent to high value assets requiring protection from bushfires (e.g. residential areas, leased areas, public utilities, historical features, visitor areas). The depth of an A-zone will range from 40 to 100 metres, however under some circumstances, as described in the Policy, the depth may be reduced to less than 40 metres (DEH 2006j).

The areas designated as A-zones are within Deep Creek and Talisker Conservation Parks and are positioned adjacent campgrounds, visitor accommodation (e.g. Southern Ocean Retreats), the workshop, ranger residences, reserve headquarters and surrounding private built assets (Map 4).

### A-zone Objectives

To provide a low fuel area of at least 40 m to help protect life (owners and firefighters) and property/built assets from radiant heat damage, flame contact and short distance ember attack;

To modify the rate of spread and fire intensity providing the highest degree of fire safety for fire crews during suppression.

### Prescriptions for Fuels in A-zones

The Overall Fuel Hazard (DEH 2006g) should not exceed *Moderate* for the areas designated as A-zones. There should be *Low* to *Moderate* fine fuel at ground or near surface levels and fuels should also be discontinuous. This will minimise the risk of a fire carrying across the zone, at or close to ground level and to reduce the path for transfer of fire into adjacent land.

### Fuel Management Strategies in A-zones

Slashing, mowing, selective fine fuel removal, trail or firebreak construction and prescribed burning are acceptable methods of fuel management in A-zones. Fuel reduction should be undertaken, as appropriate when fuel levels exceed prescribed limits (2006j). Within bushland in this zone, selective shrub removal, thinning and clearing of woody weeds may be prescribed (2006j). Fuel reduction includes both native and exotic vegetation.

## 8.4 Buffer Zone (B-zone)

### B-zone Description

A Buffer Zone, or B-zone, as explained within DEH (DEH 2006j), aims to provide a buffer area to assist in reducing the speed, intensity and spotting potential of a bushfire. This zone is usually

40 to 1000 metres wide and may apply in bushland areas in close proximity to assets requiring protection from bushfire, such as in the urban interface or urban fringe. It may also be used to provide strategic fuel reduction for a landscape, which would otherwise carry *High* to *Extreme* fuel hazard levels. This may include firebreaks in or around a reserve

In the plan area B-zones have not been placed along all reserve boundaries where the neighbouring property is predominantly grazing/cleared land up to the reserve boundary. In these instances, suppression activities can occur from the track or adjacent landholder's fuel-reduced area (e.g. grazing land). Where practical, access would be maintained on the perimeter boundary in most cases. Refer to Map 4 for an overview

**B-zone Objectives**

To minimise the likelihood of bushfire impacting on property and ecological assets;

To assist in reducing bushfire intensity, ember attack, and spotting potential which is likely to impact upon the assets in the surrounding areas or assets within the reserves;

To provide a suppression advantage to assist in containing bushfires within defined areas, that is to minimise the likelihood of fires entering the reserve from the greater landscape or exiting the reserves;

To enhance safe access for firefighters;

To provide strategic fuel reduction for a landscape, reserve, district or region.

#### Prescriptions for Fuels in B-zones

The Overall Fuel Hazard should not exceed *High* for the areas designated as B-zones (DEH 2006j).

#### Fuel Management Strategies in B-zones

Fuel management will be undertaken primarily by prescribed burning to achieve the desired level of fuel, once the available fuels exceed the prescribed limit (DEH 2006j). Fuel treatment is likely to occur in a staged manner within a B-zone and therefore fuel levels may vary from *Low* to *High.*

## 8.5 Conservation Zone (C-zone)

#### C-zone Description

The Conservation zone, or C-zone as explained within DEH (DEH 2006j), is the default zone for all areas within a reserve that are not otherwise zoned as A- or B-zones (this may include anomalous areas such as grazing leases at Deep Creek CP). The C-zone allows for fire management activities to meet ecological and conservation management objectives. The majority of Deep Creek and Talisker Conservation Parks are designated as C-zones. Eric Bonython and Waitpinga Conservation Parks are entirely C-zones. Refer to Map 4 for an overview.

**C-zone Objectives**

To manage fire to meet the reserve management objectives as specified within the plans of management listed in Section 2.5 of this document;

To assist in the conservation of species and populations such as the rated species listed in

**C-zone Objectives**

Appendix 1 and 2 through the application of appropriate fire regimes;

To assist in the conservation of ecological communities, such as the rated Swamp community that occurs across the plan area, through the application of appropriate fire regimes (Appendix 3);

To provide landscape protection in order to reduce the likelihood of Deep Creek CP burning in its entirety in a single fire event.

**Strategies for Achieving Objectives in C-zones**

Prescribed burning for Ecological Management (i.e. an *Ecological Burn*) may be undertaken within C-zones. Ecological Burns must follow the *Policy and Procedures for Ecological Burning* (DEH 2006i), which states that burning will:

- aim to meet Ecological Fire Management Guidelines for the vegetation communities that occur within the plan area (Table 2 (Section 7.3));
- have explicit ecological and burn objectives, which are consistent with this plan; and
- have specific monitoring established to assess that burn and ecological objectives are achieved and collect additional vital attribute data to contribute to refining fire management guidelines.

Prescribed burning for Landscape Protection (i.e. a *Landscape Protection Burn*) can occur within C-zones. The primary objective of a Landscape Protection Burn is to reduce the likelihood of a whole reserve or contiguous block of vegetation burning in a single fire event.

Landscape Protection Burns should aim to meet Ecological Fire Management Guidelines for the vegetation communities that occur within the plan area (Table 2 - Section 7.3). If the proposed Landscape Protection Burn is outside the stated guidelines for the MVS in question then justification must be provided in the Environmental Assessment Table (EAT) developed during prescribed burn planning. Priority should be given to burns that link existing areas of low fuel hazard (e.g. recent bushfires) to create strategic corridors that will assist in restricting the extent of bushfires.

Eleven proposed burn areas that were identified during the planning process are illustrated on Map 4. The implementation of these burns is subject to resource availability and regional priorities. Each burn area identified on Map 4 may not be burnt in its entirety. That is, the burn may itself be patchy, or the area could be divided and burnt over a number of seasons. These proposed burns are subject to the planning process as described in Section 8.6.

## 8.6 Burn Preparation

All prescribed burning (regardless of the objective, tenure or zoning) will adhere to the planning process utilising the EAT, as detailed in Figure 4 and within the *Policy and Procedures for Prescribed Burning* (DEH 2006k). The prescribed burn proposals will be assessed for impact against other issues (e.g. a prescribed burn for a threatened species must not significantly affect general habitat/vegetation values, cause weed spread or cause an unbalanced age class distribution). Approval will only be given if the potential risks of inaction outweigh the risks of conducting the burn on both target and non-target species.

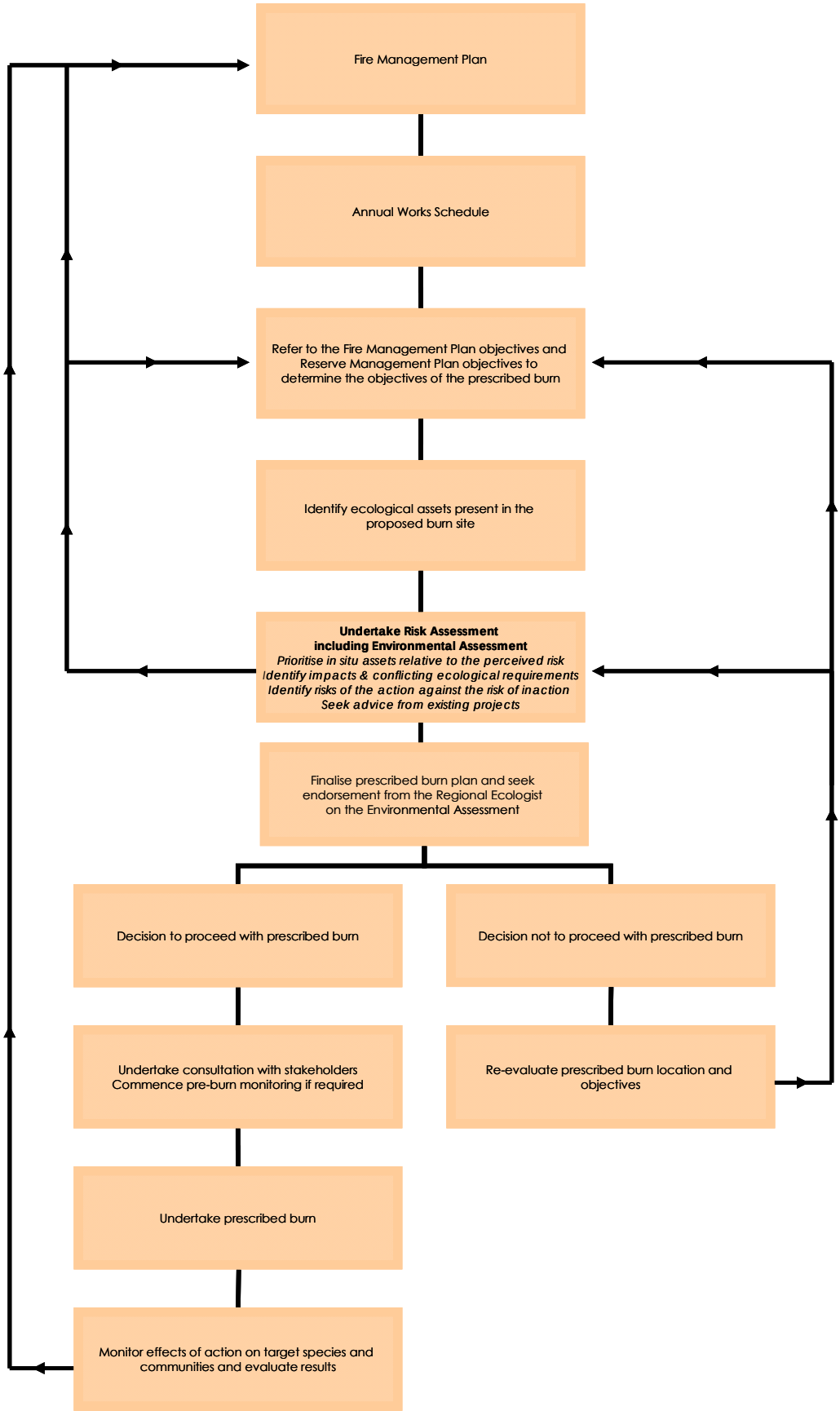



**FIGURE 4 – THE PRESCRIBED BURN PLANNING PROCESS**

# 9 BUSHFIRE SUPPRESSION

## 9.1 Legislation

Section 97 of the *Fire and Emergency Services Act 2005* explains the importance of this Fire Management Plan and the role of the CFS during a fire incident on DEH land. The legislation states that under fire or threat of a fire a member of the CFS must consult with the person in charge (if that person is in the presence of, or may be immediately contacted by, the member of the CFS of that reserve) and if the prescribed action would affect a government reserve, they must take into account any relevant provisions of a management plan for the reserve that have been brought to the attention of the member.

## 9.2 Policies and Procedures

The following Policies and Procedures are to be used in conjunction with this fire management plan:

- DEH Fire Management Policy;
- DEH Fire Management Policy and Procedures (covering various aspects of fire management);
- CFS Chief Officer Standing Orders (COSOs);
- CFS Standard Operating Procedures (SOPs); and
- CFS Operations Management Guidelines (OMGs).

Strategies implemented during an incident will be determined by the Incident Management Team (IMT), taking this plan into consideration.

## 9.3 Response – Role of CFS and DEH

The CFS has overall responsibility for fire suppression activities in SA country areas (that is, areas outside MFS fire districts). Response to a fire in Deep Creek, Talisker, Eric Bonython or Waitpinga Conservation Parks is undertaken jointly by CFS and DEH brigades who form the Southern Fleurieu CFS Group. There are three CFS stations in close proximity to these reserves: Rapid Bay (Delamere), Cape Jervis and Parawa.

DEH respond to fires in the South-western Fleurieu Peninsula in conjunction with CFS. The minimum DEH response for on reserve or fires threatening reserves is set out in the *Fire Response Plan - Adelaide Region Response Zone* (DEH 2006d) and is determined according to the fire danger rating of the day. DEH first response capacity is limited to Deep Creek CP based appliances and staff. As a fire escalates DEH responds according to a staged Region and Statewide response.

Local CFS brigades are relied upon for fire suppression activities, particularly for first and second response to an incident. Cooperation, support and understanding between CFS, DEH brigades and the local community have been vital to successful fire suppression both on and off reserve in the past, and will be critical to the success of this plan.

## 9.4 Suppression Considerations

Efforts should be made to contain bushfires using existing control lines, previously burnt areas and natural low fuel areas. Predicted fire intensity should be considered before adopting

suppression strategies. Firefighter safety and the protection of life and property are paramount. Block specific suppression information is detailed within Section 11.

### *9.4.1 Ground Crews*

Considerations:

- Steep terrain and coastal/sea breezes can influence fire behaviour.
- During *High* to *Very High* fire danger days consider backburning from control lines or access tracks (taking into account specific management objectives for each block).
- During *High* to *Very High* fire danger days, confine suppression to adjacent grazing/cleared land where it exists.
- Suppression operations are unlikely to be successful in the plan area under *Extreme* conditions and suppression should focus on asset protection.
- Fuels across the plan area are typically *Extreme* and care must be taken when developing strategies for ground fuels on *Very High* and *Extreme* fire danger days.
- Water sources generally consist of static water supplies such as dams or tanks and bores or creeks. Refer to Map 4 for specific locations, noting that:
    - The *Fire Response Plan - Adelaide Region Response Zone* (DEH 2006d) will provide the most current information on the status of water sources;
    - A dam near Deep Creek CP headquarters is the primary source of fire water available;
    - The overhead filler near Deep Creek CP headquarters relies on electricity for filling;
    - Access to water sources for fire-fighting purposes should be negotiated directly with neighbours, through the CFS Group or the District Bushfire Prevention Committee;
    - No mains water is available in the vicinity of any of the reserves included in this plan.
- The use of foams should be minimised in creeklines.
- Refer to the *Fire Response Plan - Adelaide Region Response Zone* (DEH 2006d) for current information on available utilities and facilities (note the Response Plan is updated annually).
- Implement precautionary hygiene measures as outlined in Section 7.6.
- Gates providing access to DEH managed lands are illustrated on Map 4.
- Track classifications were recorded using GAFLC standards (GAFLC 2005) and are shown on Map 4. Note that classifications may vary depending on what works have been completed and whether there has been any degradation of tracks since the assessment was conducted.

### *9.4.2 Machinery Use*

Considerations:

- Steep terrain within these reserves will considerably reduce the effectiveness of machinery and pose risks for machinery operators.
- Machinery use during fire suppression is to be in accordance with the *Policy and Procedures for Earthmoving Equipment* (DEH 2006h), which states that CFS must liaise

with a delegated DEH officer before engaging earthmoving equipment on DEH managed lands.

- Standards for control lines are to be accordance with the *Standard Operating Procedure for Fire Control Lines* (DEH 2002c).
- The use of control lines will be determined by the IMT, based on fire severity and weather conditions, giving due consideration to safety and strategic advantage.
    - New fire access on reserves will only be constructed for the purpose of fire suppression, where provided for in planning, or where approved by the Incident Controller in liaison with DEH staff.
    - Minimal disturbance suppression techniques and specialised equipment that reduces impacts to the landscape shall be used wherever possible.
- Implement precautionary hygiene measures as outlined in Section 7.6.

#### *9.4.3 Aerial Suppression*

Considerations:

- A CFS approved landing ground is located approximately 1.5 km north of the Range Road and Backhouse Road intersection within Second Valley Forest Reserve (Map 4). This is approximately 3 km due north of Deep Creek CP.
- Aerial suppression may be the most appropriate strategy in difficult terrain to complement works undertaken by ground crews.
- Implementation of aerial suppression is to be in accordance with the *Standard Operating Procedure for Air Operations* (DEH 2002b).
- The use of retardant should be in accordance with the *Standard Operating Procedure for Fire Suppression Chemicals* (DEH 2002d) and restricted:
    - to critical situations such as the protection of built assets, both within the reserve and off-reserve and
    - in environmentally sensitive areas, including wetlands, watercourses and the habitat of threatened species.

### 9.5 Fire Access

Guidelines for Fire Access Tracks and Firebreaks in South Australia have been approved by the Government Agencies Fire Liaison Committee (GAFLC 2005) The guidelines include prescriptions and standards for various, fire access tracks and firebreaks. They also provide guidelines for adjacent fuel management, positioning and maintenance, mapping, signage and safety. Fire access points and tracks have been reviewed as part of this plan. The current standard of tracks is illustrated on Map 4. Proposed changes are outlined within Section 11 and also are summarised within Section 12.

### 9.6 Post-fire Rehabilitation and Recovery

DEH has a *Policy and Procedure for Post-fire Rehabilitation* (2007c) to ensure that the post-fire rehabilitation and recovery of a reserve is identified during an incident. A post-fire rehabilitation plan should be prepared and should describe the areas affected by fire and impacts on the natural and built environment. Specific objectives of post-fire rehabilitation plans are outlined within the Policy and Procedure.

# 10 RESEARCH AND MONITORING

Where prescribed burns in C-zones are likely to impact on species of conservation significance, planning will be undertaken in conjunction with the relevant Recovery Teams, including:

- Lofty Block Threatened Orchid Recovery Team;
- MLR Southern Emu-wren and Swamps of Fleurieu Peninsula Recovery Team; and
- MLR Southern Brown Bandicoot Recovery Team.

## 10.1 Monitoring

Monitoring will be established in conjunction with any prescribed burns conducted within the plan area, in accordance with DEH Policy and Procedures. This includes the ***Policy and Procedure for Prescribed Burning*** (DEH 2006k), incorporating the Environmental Assessment Table and monitoring procedures. Refer to Section 8.5 and 8.6 of this plan for general information on C-zone burning and the planning requirements.

It is recommended that monitoring be undertaken to:

**Monitoring**

42. Investigate the fuel accumulation rates of the various MVS that occur within the plan area (Table 1). These data will help DEH staff determine if and when fuel reduction works are required, ultimately assisting in the scheduling of operational works and activities in B-zones.

43. Assess the suitability of the proposed weed management guidelines for the control of introduced species following fire, including English Broom, Blackberry and Gorse (Appendix 1).

44. Examine the appropriateness of the proposed fire interval guidelines for the Southern Brown Bandicoot, in conjunction with the Southern Brown Bandicoot Recovery Team (Appendix 2).

45. Assess the accuracy of the proposed extent and season of burn guidelines and for the MLR Southern Emu-wren, in conjunction with the MLR Southern Emu-wren and Swamps of Fleurieu Peninsula Recovery Team (Appendix 2).

46. Investigate the appropriateness of the proposed extent of burn guidelines on the MLR Chestnut-rumped Heathwren (Appendix 2).

## 10.2 Research

Any fire-related research that is proposed within the plan area should be discussed with the Senior Fire Research Officer, Fire Management Branch.

It is recommended research should be undertaken to:

**Research**

47. Investigate the suitability of the Ecological Fire Management Guidelines for MVS through the assessment of historical fire regimes in similar communities across the state (Table 2 – Section 7.3).
48. Explore the effects of season of burn, fire intensity and fire frequency on Southern Brown Bandicoot populations and preferred habitat structure and use this information to update the Ecological Fire Management Guidelines (Appendix 2).
49. Investigate the effects of fire intensity and fire frequency on MLR Southern Emu-wren populations and preferred habitat and use this information to update the Ecological Fire Management Guidelines (Appendix 2).
50. Examine the effects of fire regime on Swamp communities, particularly season of burn, fire frequency, fire interval and fire intensity and use this information to propose Ecological Fire Management Guidelines.
51. Research the effects of fire regime, particularly fire interval, fire frequency, season of burn and fire intensity on MLR Chestnut-rumped Heathwren populations and preferred habitat and use this information to update the Ecological Fire Management Guidelines (Appendix 2).
52. Explore the effects of fire regime, particularly season of burn, fire frequency, fire interval and fire intensity on Nationally rated flora species, including: Osborn's Eyebright *(Euphrasia collina* ssp. *osbornii)*, Kangaroo Island Spider Orchid and Clover Glycine *(Glycine latrobeana)* and use this information to propose Ecological Fire Management Guidelines.

# 11 FIRE MANAGEMENT BLOCKS

The plan area has been divided into 10 fire management blocks to ensure that information and issues unique to a particular area have been addressed (Map 4). Block boundaries are based upon access and the practicalities of implementing the fire management objectives of a particular area. Talisker, Eric Bonython and Waitpinga Conservation Parks are treated in their entirety as blocks for fire management purposes. Deep Creek CP is divided into seven blocks. Refer to Table 3 (below) for information on the name, size and location of each block.

**TABLE 3 – OVERVIEW OF FIRE MANAGEMENT BLOCKS**

| Reserve | Block Name | Area (ha) |
|---|---|---|
| Talisker Conservation Park | Talisker Block | 216 |
| Deep Creek Conservation Park | Goondooloo Block | 636 |
| | Deep Creek/Tent Rock Block | 1725 |
| | Florence/Glenburn Block | 214 |
| | Krichauff Block | 214 |
| | Leaselands Block | 483 |
| | Tapanappa Block | 449 |
| | Boat Harbor Block | 654 |
| Eric Bonython Conservation Park | Eric Bonython Block | 6 |
| Waitpinga Conservation Park | Waitpinga Block | 3 |

## 11.1 Fire Management Block Prescriptions

Block prescriptions describe the block and identify specific zones and proposed works relating to that block. Block prescriptions include summaries of relevant information such as land use, vegetation, fuel hazard, fire risk, fire access, assets, zoning, recommended works and guidelines for suppression. Known species and communities of conservation significance are listed in Appendices 1, 2, and 3, along with the block name, the associated MVS and the corresponding fire response and fire management guidelines. Objectives (in addition to those in Section 2.7) and actions that only apply to a specific block are included in the following sections. A map to supplement the fire management strategies has been created for the plan area (Map 4).

## TALISKER BLOCK

### Tenure, (Size), Land Use

Talisker CP (216 hectares)

### Vegetation

MVS No. 4, 8, 9

Dominated by a Messmate Stringybark forest over tall shrubs and mid ferns. Most of the vegetation in the reserve is regrowth that has occurred since mining operations ceased at Talisker mine 80 to 100 years ago. Small sections of the block have open grassland.

### Fire History

No fires have been recorded within this block. A number of small fires have been recorded to north of this block.

### Fuel Hazard

***Overall*** Predominantly *Very High* to *Extreme.*

***Bark*** *Very High* to *Extreme* in the Messmate Stringybark areas of the block (due to lack of fire).

### Natural Values

The Nationally *Vulnerable* Clover Glycine occurs within this block. Other flora species of conservation significance are included in Appendix 1. No fauna of State or National conservation significance have been recorded for this block.

### Heritage Values

Heritage-listed mine ruins of Talisker and Campbell Creek Mines (historic silver-lead mine). Assets include buildings, a powder magazine, a processing plant and shafts.

### Built Assets

***On-reserve*** Visitor facilities associated with the Talisker Mine site.

***Off-reserve*** Silverton township 50 m north-east of the boundary; Taldahari student camp to the south-west; Heritage Agreement adjoining western boundary (access to property is via Government road through block).

### Fire Risk

The risk of the whole reserve burning and/or fire impacting Silverton township has been assessed as *Moderate* to *High*. If a fire occurs in this block then Silverton properties may experience ember attack under a westerly or south-westerly wind.

The likelihood of a fire starting from lightning in this block is *Unlikely*. The likelihood of a fire burning this block as a result of human-caused ignitions is *Possible*. This type of ignition has a higher likelihood based on records of human-caused ignitions near this block compared with fires started by lightning.

### Fire Tracks (GAFLC classification)

| | |
|---|---|
| ***Major*** | Talisker Road |
| | Rarkang Road (part) |
| ***Standard*** | Rarkang Road (part) |
| ***Minor*** | Track near northern section of block (unnamed) |
| | Track off Talisker Road (unnamed) |

### Specific Management Objectives for Talisker Block

- Minimise the likelihood of fire impacting Silverton, adjoining heritage agreements and Taldahari student camp.
- Ensure visitor safety at the Talisker Mine ruins.
- Minimise the likelihood of fire or fire suppression operations damaging the heritage mine site.

- Ensure appropriate management in line with Ecological Fire Management Guidelines for flora of conservation significance (Appendix 1) and MVS (Table 2), in particular the Nationally rated Clover Glycine.

### Proposed Zoning

- A-zone (minimum 40 m) incorporating the Talisker Mine ruins.
- A-zone (50m) along Rarkang Road to minimise the likelihood of fire impacting the heritage-listed building at Silverton.
- B-zone (50m) bordering eastern edge of block along Rarkang Road and around to Talisker Road to minimise the likelihood of fire impacting Silverton township.

*Note: No A- or B-zone has been proposed for the south-western edge of the block, as Taldahari student camp is located more than 600 m from the reserve boundary.*

### Recommended Works

***Pre-suppression***

Existing:

- Most tracks are slashed on annual basis with verge trimming and grading done on a cyclical basis.

Proposed:

- Develop an Emergency Action Plan to address visitor safety during bushfires (refer to Section 5.3).
- Upgrade the track to the Talisker Mine site to a service track, to improve access to the mine site for fuel removal.
- A-zone at Talisker Mine site. Fuel reduction should be mainly undertaken by selective mechanical removal.
- Fuel reduce A- and B-zone adjacent Silverton township. Fuel modification to be aimed at reducing the *Very High* to *Extreme* levels of bark hazard present, to minimise the likelihood of ember attack on these assets.
- Fuel reduction in strategic areas within the C-zone to strengthen the B-zone along Rarkang Road and to create patchiness and minimise the likelihood of fires impacting on neighbouring properties. Three areas have been proposed for C-zone burning for landscape protection within this block, however each area identified may not be burnt in its entirety (i.e. the burn may itself be patchy, or the area could be divided and burnt over a number of seasons). Refer to Map 4.

***Suppression***

Further to the general suppression considerations detailed in Section 9.4, suppression planning should consider:

- Safety of ground crews within the block in regards to:
  - the presence of mine shafts;
  - steep terrain; and
  - limited access.
- Protection of the adjacent Heritage Agreements.
- Protection of Silverton township and Taldahari student camp.
- Limited access to residences and the Taldahari student camp (the use of camp facilities is restricted during the fire season).
- Visitor safety and impacts of suppression operations in the Talisker Mine precinct.
- Restricting suppression to adjacent grazing/cleared land during *High* to *Very High* fire danger days.

## GOONDOOLOO BLOCK

### Tenure, (Size), Land Use

Deep Creek CP (636 hectares).

### Vegetation

MVS No. 4, 8, 9, 32

Dominated by a Pink Gum and Drooping Sheoak woodland over mid shrubs and low shrubs. The western side of block was heavily grazed until 1983, after which natural regeneration of vegetation has occurred supported by a revegetation program. There is anecdotal evidence that the southern portion of this block had a grazing and burning regime up until the early 1970s. Kangaroo Thorn now dominates the vegetation in this part of the block. The northern section of the block was grazed heavily until 1982 and approximately 30% of this area is still relatively open grassland.

### Fire History

A fire in 1990 burnt approximately 53 hectares of this block, which was attributed to ignition by an unattended campfire. A fire in 1997 of approximately seven hectares was attributed to ignition by lightning. The eastern edge of the block was affected by the 1980 fire, which burnt a total of 2 429 hectares of the central section of Deep Creek CP.

### Fuel Hazard

***Overall*** *Extreme* overall fuel hazard recorded on eastern side of block, adjacent Deep Creek/Tent Rock block. The southern part of the block has an *Extreme* fuel hazard due to the presence of Kangaroo Thorn. *Low* fuel hazard has been recorded in open grassland including areas near Goondooloo Cottage in the north, along Blowhole Beach Road and south towards Blowhole Beach.

***Elevated*** *Extreme* elevated fuel hazard in the eastern section of the block.

### Natural Values

The Nationally *Endangered* MLR Southern Emu-wren has been recorded within this block. No Nationally rated flora species have been recorded. State rated flora and fauna species of conservation significance that have been recorded for this block are included in Appendix 1 and 2. The Nationally *Critically Endangered* Fleurieu Peninsula Swamp community occurs within this block (Appendix 3).

### Built Assets

***On-reserve*** Ranger residence, Goondooloo Cottage (Southern Ocean Retreats) and Eagle Waterhole Campground (including hut and rainwater tank).

***Off-reserve*** Private residences along western boundary.

### Fire Risk

The likelihood of a human-caused fire originating in this block is *Possible*, due to potential ignition sources at campgrounds. Under the influence of a strong south-easterly wind it is *Possible* that fire could threaten visitors at Blowhole Beach, Cobbler Hill Campground, Eagle Waterhole Campground, or within the adjacent land in steep terrain away from the coast.

### Fire Tracks (GAFLC classification)

***Major*** Blowhole Beach Road

***Standard*** Along eastern boundary (unnamed)

***Minor*** Cobbler Hill Campground circuit track (unnamed)

***Service*** From western boundary to Aaron Creek Hike trail via Eagle Waterhole Hut (unnamed)
Heysen Trail service track, off Blowhole Beach Road (unnamed)
Blowhole Beach service track (unnamed)

### Specific Management Objectives for Goondooloo Block

- Minimise the likelihood of fires leaving the block and impacting on adjacent properties, such as those along Blowhole Beach Road.

- Ensure visitor safety in areas such as the Cobbler Hill and Eagle Waterhole Campgrounds, Cobbler Hill and Aaron Creek Picnic Areas, Blowhole Beach and walking trails.
- Minimise the likelihood of fire impacting upon built assets within the block, such as Goondooloo Cottage and the ranger's residence.
- Ensure appropriate management in line with Ecological Fire Management Guidelines for flora, fauna and communities of conservation significance (Appendix 1, 2 and 3) and MVS (Table 2), in particular the Nationally rated MLR Southern Emu-wren and Swamps of the Fleurieu Peninsula.

### Proposed Zoning

- A-zone (minimum 40 m) to minimise the likelihood of fire impacting Cobbler Hill Campground, Eagle Waterhole Campground and hut and other built assets such as the ranger's residence.
- A-zone (minimum 40 m) to minimise the likelihood of a fire impacting Goondooloo Cottage achieved using mechanical methods.
- A-zones (minimum 40 m) along various sections of Blowhole Beach Road to minimise the likelihood of fire impacting assets within 40 m of the reserve boundary.
- B-zones (40 m) along the length of Blowhole Beach Road, between Goondooloo Cottage and Cobbler Hill Campground to minimise the likelihood of fire burning into adjacent land.
- B-zone (minimum 100 m) along the eastern boundary of the block from Eagle Waterhole Campgrounds to the Heysen Trail in order to strengthen a control line.
- B-zone in south-western area of block (16 ha), between Blowhole Beach Hike trail and Blowhole Beach Road to reduce the impact of a fire entering/exiting the reserve.

### Recommended Works

#### *Pre-suppression*

Existing:

- Most tracks are slashed on annual basis with verge trimming and grading done on a cyclical basis.

Proposed:

- Develop an Emergency Action Plan to address visitor safety during bushfires (refer to Section 5.3).
- Maintain Blowhole Beach Road as a major track.
- Fuel reduce A- and B-zones to the required levels.

#### *Suppression*

Further to the general suppression considerations detailed in Section 9.4, suppression planning should consider:

- Safety of ground crews and suppression within the block (particularly in the south-west and north-west sections) in regards to steep terrain and dense vegetation.
- Using dry firefighting techniques wherever possible to contain fires within this block.
- Protection of properties along Blowhole Beach Road, especially those positioned to the north-west of the block.
- Protection of on-reserve assets such as Goondooloo Cottage and the ranger's residence.
- Visitor safety, especially along Heysen Trail and at Goondooloo Cottage, Cobbler Hill Campground, Aaron Creek Picnic Area, Cobbler Hill Picnic Area, Blowhole Beach and Eagle Waterhole Campground.
- Implementing aerial support to increase firefighter safety and aid in suppression.

## DEEP CREEK/TENT ROCK BLOCK

### Tenure, (Size), Land Use

Deep Creek CP (1 654 ha) and the unreserved land to the west, proposed for addition to the reserve (71 ha).

### Vegetation

MVS No. 4, 8, 9, 32

The block is dominated by Pink Gum woodland over mid shrubs and low forbs. The block supports areas of dense vegetation dominated by Kangaroo Thorn and a coastal heath association likely to significantly influence fire behaviour. The Tapanappa ridge area along the eastern block boundary consists of dense stands of Gorse and a control program is in place to reduce weed density.

### Fire History

A bushfire that occurred in 1980 burnt the block in its entirety as part of the larger fire that burnt a total of 2 429 hectares of the central section of Deep Creek CP.

### Fuel Hazard

***Overall*** *Very High* to *Extreme* fuel across the block.

***Elevated*** *Extreme* where Kangaroo Thorn and the coastal heath association are present.

### Natural Values

This block is the second most significant block (after the Boat Harbor block) within Deep Creek CP for the Nationally *Endangered* MLR Southern Emu-wren (refer to Section 6.2.2). The Nationally *Endangered* Southern Brown Bandicoot, *Endangered* MLR Chestnut-rumped Heathwren and *Vulnerable* Kangaroo Island Spider-orchid also occur within this block. Other flora and fauna of State conservation significance that have been recorded for this block are included in Appendix 1 and 2. The Nationally *Critically Endangered* Fleurieu Peninsula Swamp community occurs within this block (Appendix 3).

### Built Assets

***On-reserve*** Tapanappa Campground (including toilets and picnic tables) and Trig Campground (including toilets, rainwater tank and picnic tables).

### Fire Risk

It is considered *Possible* that a fire will occur within this block given the 1980 fire (which was attributed to human-caused ignition) and the existing potential ignition sources at campgrounds. If a fire occurred in this block it could potentially threaten Trig Campground.

### Fire Tracks (GAFLC classification)

***Major*** Tent Rock Road (part)
Track through Tapanappa Campground to the day visitor carpark (unnamed)
Two tracks along the boundary of the proposed addition (unnamed)

***Standard*** Tent Rock Road (part)

***Minor*** Black Bullock Road
Tracks surrounding Trig and Tapanappa Campgrounds (unnamed)
Track along the northern block boundary (unnamed)
Various tracks in the northern section of the block (unnamed)

***Service*** Various tracks that terminate with a no through road (unnamed)

### Specific Management Objectives for Deep Creek/Tent Rock Block

- Develop an emergency procedure or action plan to ensure visitor safety during bushfires, particularly to take into account safety on walking tracks that traverse this block, such as the Heysen Trail, Deep Creek Waterfall Trail and Deep Creek Cove Trail. Plan to be developed as part of an overall emergency procedure covering the entire plan area.

- Minimise the likelihood of fires exiting the block and impacting upon adjacent properties.
- Provide some landscape protection, to reduce likelihood of whole reserve burning in single fire event.
- Ensure appropriate management in line with Ecological Fire Management Guidelines for flora, fauna and communities of conservation significance (Appendix 1, 2 and 3) and MVS (Table 2), in particular the Nationally rated MLR Southern Emu-wren, Southern Brown Bandicoot, MLR Chestnut-rumped Heathwren, Kangaroo Island Spider-orchid and Swamps of the Fleurieu Peninsula.
- Enhance habitat for the MLR Southern Emu-wren and Southern Brown Bandicoot.

### Proposed Zoning

- A-zone (minimum 40 m) for Trig and Tapanappa Campgrounds.
- B-zone (250 m) north of Trig Campground to the block boundary to buffer the A-zone.
- B-zone (200 m) along section of the road on the western block boundary.
- B-zone (minimum 50 m) along the length of the road along section of the eastern block boundary.

### Recommended Works

***Pre-suppression***

Existing:

- Most tracks are slashed on annual basis with verge trimming and grading done on a cyclical basis

Proposed:

- Develop an Emergency Action Plan to address visitor safety during bushfires (refer to Section 5.3).
- Upgrade various internal tracks from minor to standard tracks, in order to provide better access for fire management activities.
- Fuel reduce A- and B-zones to the required levels.
- Four areas have been proposed for C-zone burning within this block, however each area identified may not be burnt in its entirety (i.e. the burn may itself be patchy, or the area could be divided and burnt over a number of seasons). Refer to Map 4. Prescribed burning will be implemented within this block to:
  - reduce fuel loads in strategic areas;
  - increase patchiness and provide refuge areas for fauna (e.g. Southern Brown Bandicoot and MLR Southern Emu-wren);
  - provide some landscape protection for the block and the greater reserve in order to reduce the likelihood of whole reserve burning in single fire event;
  - reduce the fire intensity during a bushfire; and
  - monitor effects of fire on the MLR Southern Emu-wren and Southern Brown Bandicoot populations and their habitat (in liaison with the respective Recovery Teams).
- Recommend to DBPC that Black Bullock Road be upgraded from a minor track to a standard track.

***Suppression***

Further to the general suppression considerations detailed in Section 9.4, suppression planning should consider:

- Safety of ground crews within the block in regards to:
  - *Very High* to *Extreme* fuel hazards;

  - steep terrain; and
  - limited access (existing tracks tend to be restricted to the perimeter. Some sections have no access where the native vegetation is contiguous with private land).
- Weather conditions, in regards to the potential for a fire to burn the block in its entirety and escape into adjacent land:
  - under a westerly wind; and
  - if a fire started within Trig Campground and is burning under a south-easterly wind.
- Visitor safety on the Heysen Trail, Deep Creek Cove, Deep Creek Waterfall, Trig Campground, Tapanappa Campground, Tapanappa day visitor carpark and along the various walking trails within this block.
- Implementing aerial support to increase firefighter safety and aid suppression.

## FLORENCE/GLENBURN BLOCK

### Tenure, (Size), Land Use

Deep Creek CP (214 ha).

### Vegetation

MVS No. 4, 8

Predominantly Messmate Stringybark forest over tall shrubs and mid ferns.

### Fire History

A fire in 1980 burnt the block south of Stringybark Campground and Deep Creek CP headquarters as part of the larger fire that burnt a total of 2 429 hectares of the central section of Deep Creek CP.

### Fuel Hazard

***Overall*** *Extreme* for majority of block including the southern section and north through to the Spring Wildflower Walk trail. A lower fuel hazard was recorded for areas north of the Spring Wildflower Walk trail. The area including the Deep Creek CP headquarters, workshop and Glenburn Cottage has a *Low* overall fuel hazard.

### Natural Values

The Nationally rated MLR Southern Emu-wren has been recorded within this block. No flora species of National conservation significance have been recorded. Fauna and flora species of State conservation significance that have been recorded are included in Appendix 1 and 2. The Nationally *Critically Endangered* Fleurieu Peninsula Swamp community also occurs within this block (Appendix 3).

### Built Assets

***On-reserve*** Significant built assets include Deep Creek CP headquarters and workshop area, Ridgetop Retreats accommodation, Glenburn Cottage accommodation and facilities at Stringybark Campground (including the toilets, showers, dishwashing area and rainwater tank).

### Fire Risk

The likelihood for fire ignitions is *Possible* in this block, given the 1980 fire (human-caused) and existing potential ignition sources at Stringybark Campground.

### Fire Access

| | |
|---|---|
| ***Major*** | Tapanappa Road |
| ***Standard*** | Spring Wildflower Walk (track which extends from Black Bullock Road) |
| | Track to Deep Creek CP headquarters (unnamed) |
| | Track via DEH workshop (unnamed) |
| | Track via Stringybark Campground (unnamed) |
| | Track via Ridgetop Retreats (unnamed) |
| ***Minor*** | Track around Stringybark Campground (unnamed) |
| | Track along western and southern block boundary (unnamed) |
| ***Service*** | Two tracks that terminate with no through roads on western boundary (unnamed) |

### Specific Management Objectives for Florence/Glenburn Block

- Ensure visitor safety (for example at Ridgetop Retreats, Glenburn Cottage, Deep Creek CP headquarters and Stringybark Campground).
- Minimise the likelihood of fires leaving the block and impacting on adjacent properties.
- Minimise the likelihood of fires impacting built assets within the block at Deep Creek CP headquarters, workshops, Ridgetop Retreats, Glenburn Cottage and Stringybark Campground.

- Minimise the likelihood of fire burning north to south or vice versa, from Krichauff to Florence/Glenburn blocks.
- Ensure appropriate management in line with Ecological Fire Management Guidelines for flora, fauna and communities of conservation significance (Appendix 1, 2 and 3) and MVS (Table 2), in particular the Nationally rated MLR Southern Emu-wren and Swamps of the Fleurieu Peninsula.

## Proposed Zoning

- A-zone (minimum 80 m) to assist in the protection of the Deep Creek CP headquarters, workshop area, Glenburn Cottage and Stringybark campground. Around Glenburn Cottage the A-zone should be achieved through mechanical means.
- A-zone (minimum 40 m) to assist in the protection of the Ridgetop Retreats (minimal impact methods should be employed)
- B-zone to assist in the protection of Ridgetop Retreats by adding to the A-zone surrounding the cottages (approximately 200 m to the north and 200 m to the south of the Ridgetop Retreats, and reaching from east to west across the block) and to provide some landscape protection.

## Recommended Works

### *Pre-suppression*

Existing:

- Most tracks are slashed on annual basis with verge trimming and grading done on a cyclical basis.

Proposed:

- Develop an Emergency Action Plan to address visitor safety during bushfires (refer to Section 5.3).
- Continue slashing and verge trimming program associated with ongoing track maintenance works.
- Fuel reduce A- and B-zones to the required levels (the preferred method of fuel modification in the A-zone surrounding Ridgetop Retreats is hand removal).

### *Suppression*

Further to the general suppression considerations detailed in Section 9.4, suppression planning should consider:

- Protection of significant on-reserve assets such as Ridgetop Retreats (note that this facility has a fire protection system), Glenburn Cottage, Stringybark Campground, Deep Creek CP headquarters and workshops.
- Presence of flammable chemicals such as fuel at the workshops.
- Visitor safety at Ridgetop Retreats, Glenburn Cottage, Stringybark Campground, Deep Creek CP headquarters, workshops and along the various walking trails within this block (Forest Circuit Walk and Spring Wildflower Walk).
- Implementing aerial support to aid in the protection of life and property.
- The likelihood that existing breaks and tracks will not be sufficient to contain a fire within this block under extreme fire conditions.

## KRICHAUFF BLOCK

### Tenure, (Size), Land Use

Deep Creek CP (214 ha)

### Vegetation

MVS No. 4

The block is dominated by a Messmate Stringybark forest over tall shrubs and mid ferns. The Messmate Stringybark forest has had no significant impact or disturbance for at least 80 years.

### Fire History

There is anecdotal evidence that suggests that the block is long unburnt (80+ years).

### Fuel Hazard

***Overall*** *Very High* to *Extreme* across the majority of the block.

***Bark*** *Very High* to *Extreme* across the majority of block due to the presence of stringybarks.

### Natural Values

The long unburnt stringybarks that exist in this block are considered significant. No Nationally rated flora or fauna species have been recorded within this block. State rated flora and fauna species of conservation significance that have been recorded are included in Appendix 1 and 2. The Nationally *Critically Endangered* Fleurieu Peninsula Swamp community also occurs within this block (Appendix 3).

### Built Assets

***On reserve*** Infrastructure associated with the picnic ground at the beginning of Stringybark Loop Walk trail.

***Off-reserve*** Adjacent assets include Raywood Nursery to the south-west and farms to the north.

### Fire Risk

There is an *Extreme* risk of a fire in this block spreading through contiguous vegetation to adjacent blocks and other land tenures, including the forestry plantations to the north. The *Extreme* bark hazard that is present within this block means that neighbouring blocks and properties are potentially at risk from ember attack.

### Fire Access

***Major*** Three Bridges Road
Tapanappa Road

***Minor*** Track running parallel to Backhouse Road and continuing around northern boundary of block (unnamed)

***Service*** Backhouse Road

### Specific Management Objectives for Krichauff Block

- Minimise the likelihood of fires leaving the block and impacting on adjacent properties such as Raywood Nursery (to the east) and ForestrySA plantations (to the north and north-west).
- Provide landscape protection against the entire block burning in one fire event and fire impacting the stand of long unburnt stringybarks.
- Ensure appropriate management in line with Ecological Fire Management Guidelines for flora, fauna and communities of conservation significance (Appendix 1, 2 and 3) and MVS (Table 2), in particular the Nationally rated Swamps of the Fleurieu Peninsula.

### Proposed Zoning

- B-zone (40 m) adjacent Backhouse Road to reduce the likelihood of a fire crossing the road, therefore assisting in protection of Raywood Nursery and adjacent native vegetation.

## Recommended Works

### *Pre-suppression*

Existing:

- Most tracks are slashed on annual basis with verge trimming and grading done on a cyclical basis

Proposed:

- Develop an Emergency Action Plan to address visitor safety during bushfires (refer to Section 5.3).
- Continue the slashing and verge trimming program associated with ongoing track maintenance.
- Recommend to DBPC that Backhouse Road be permanently closed, rehabilitated and fenced between Tapanappa Road and northern point of the Krichauff block extension (as first preference). If it is required that Backhouse Road be kept open, it should be upgraded to a minor track.
- Fuel reduce to meet B-zone requirements between Backhouse Road and the minor track (Note: If Backhouse Road remains open, fencing is recommended between the road and the minor track).
- Upgrade the minor track running parallel to Backhouse Road that continues along northern boundary to a standard track (requires turnaround point). Upgrade required particularly along the Backhouse Road section.
- One area has been proposed for C-zone burning within this block, however the area identified may not be burnt in its entirety (i.e. the burn may itself be patchy, or the area could be divided and burnt over a number of seasons). Refer to Map 4. Prescribed burning will be undertaken in this block to:
  - reduce fuel loads in strategic areas;
  - increase patchiness of the vegetation;
  - provide some landscape protection for the block and the greater reserve in order to reduce the likelihood of whole reserve burning in single fire event; and
  - reduce the fire intensity during a bushfire.

### *Suppression Considerations*

Further to the general suppression considerations detailed in Section 9.4, suppression planning should consider:

- Protection for Raywood Nursery and the presence of the dense native vegetation to the east of the block contiguous to the nursery.
- Protection for the ForestrySA plantations to the north and north-west of the block.
- The presence of long unburnt stringybark forest and dense canopy (MVS No. 4) in regards to:
  - fire intensity and spotting potential;
  - safety of ground crews due to falling limbs; and
  - potential impacts on the ecological values of this area.
- Limited access within the block, especially in the Krichauff Block extension (east of Backhouse Road), which has no boundary fencing or tracks.
- Visitor safety on the trail network (Stringybark Loop Walk).
- Restricting ground based suppression from the track network to *Low* to *Moderate* fire danger days, in conjunction with aerial support.

## LEASELANDS BLOCK

### Tenure, (Size), Land Use

Deep Creek CP (483 ha). The majority of this block is under a grazing lease.

### Vegetation

MVS No. 4, 8, 32

The majority of this block has unclassified vegetation, as the land is mostly cleared and operating under a grazing lease. The northern section of the block is mostly open grazing country. There are windbreaks of pines within this block.

### Fire History

A bushfire that occurred in 1980 burnt the western section of this block, as part of the larger fire that burnt a total of 2 429 hectares of the central section of Deep Creek CP.

### Fuel Hazard

***Overall*** Most of the block has a *Low* fuel hazard due to the current land use, although *Extreme* overall fuel hazard exists within the swamp area.

### Natural Values

No Nationally rated flora or flora species have been recorded for this block. No flora species of state conservation significance have been recorded. Fauna species of State conservation significance that have been recorded are included in Appendix 1 and 2. The Nationally *Critically Endangered* Fleurieu Peninsula Swamp community also occurs within this block (Appendix 3).

### Built Assets

***On-reserve*** Buildings and sheds associated with the leased area, Deep Creek Homestead (Southern Ocean Retreats) and the ranger's residence.

### Fire Risk

The likelihood of fire resulting from ignition by human-causes is considered *Unlikely* due to the current land use, *Low* fuel levels and limited public access. Ignition as a result of a lightning strike is considered *Possible* as there are records of this occurring in the past.

### Fire Access

***Major*** Tapanappa Road
Track running north-south through the block (unnamed)

***Minor*** Boat Harbor Road
Track on southern boundary of block (unnamed)
Track from north-south track to Deep Creek Homestead (unnamed)
Track to grazing lease buildings (unnamed)

### Specific Management Objectives for Leaselands Block

- Minimise the likelihood of fires impacting on assets within or adjacent this block.
- Minimise the likelihood of fire burning into adjacent blocks, where suppression opportunities are limited.
- Ensure appropriate management in line with Ecological Fire Management Guidelines for fauna and communities of conservation significance (Appendix 2 and 3) and MVS (Table 2), in particular the Nationally rated Swamps of the Fleurieu Peninsula.

### Proposed Zoning

- A-zones (minimum 40 m) to assist in the protection of the ranger's residence and the grazing lease buildings.
- A-zones (minimum 40 m) to assist in the protection of Deep Creek Homestead achieved by mechanical means.
- B-zone (50 m) along road running north-south through the centre of block to reduce the likelihood of the block and greater reserve burning in one fire event.

## Recommended Works

### *Pre-suppression*

Existing:

- Most tracks are slashed on annual basis with verge trimming and grading done on a cyclical basis.

Proposed:

- Develop an Emergency Action Plan to address visitor safety during bushfires (refer to Section 5.3).
- Upgrade Boat Harbor Road to a standard track.
- Form a new minor track (minimum) on cleared land in south-east section of this block to link Boat Harbor, Tapanappa and Deep Creek/Tent Rock blocks. Install two gates, one on Boat Harbor Road and another on the track within Tapanappa block.
- Fuel reduce A- and B-zones to the required levels (fuel modification in the A-zone surrounding the grazing lease assets is likely to be achieved by mechanical means).

### *Suppression*

Further to the general suppression considerations detailed in Section 9.4, suppression planning should consider:

- Protection of life and property, especially along Tapanappa Road, at the neighbouring farm and at Deep Creek Homestead. Evacuations may need to be carried out.
- Safety of ground crews within the block, in regards to:
  - dense vegetation, especially within those areas supporting Gorse and remnant vegetation; and
  - falling trees due to the pine windbreaks being impacted by fire.
- Visitor safety at the Deep Creek Homestead.
- Using the grazing land to implement direct attack by ground crews, supported by aerial suppression.
- The potential for a fire to burn into Tapanappa Block if suppression fails to contain the fire using the last control line toward the south of this block.
- Treating the swamps in the centre of the block as an exclusion zone during suppression.

## TAPANAPPA BLOCK

### Tenure, (Size), Land Use

Deep Creek CP (449 ha).

### Vegetation

MVS No. 4, 8, 9, 21

Dominated by a mixed Cup Gum forest over tall shrubs and low shrubs. Most of the block was grazed until the 1970s and significant areas of grassland still remain. Dense stands of coastal heath and Kangaroo Thorn have regenerated after the 1980 fire and will influence fire behaviour. A Gorse control program has been implemented to reduce the weed density.

### Fire History

In 1980 a fire burnt a large portion of this block (except for the north-eastern section), as part of the larger fire that burnt a total of 2 429 hectares of the central section of Deep Creek CP. A fire that occurred in 1983 burnt the north-eastern section of this block, as part of a larger fire that burnt 723 ha of the eastern section of Deep Creek CP.

### Fuel Hazard

***Overall*** *Very High* to *Extreme* throughout the majority of block, which is represented in vegetation such as the coastal heath association and areas dominated by Kangaroo Thorn. *Very High* to *Extreme* overall fuel hazard present in the far northern, central section of the block as well as the coastal fringe.

***Elevated*** *Extreme* in the central and southern sections through to the coast.

### Natural Values

The Nationally *Endangered* MLR Southern Emu-wren has been recorded as occurring within this block. No Nationally rated flora species have been recorded for this block. Fauna and flora of State conservation significance recorded in the block are described in Appendix 1 and 2. The Nationally *Critically Endangered* Fleurieu Peninsula Swamp community also occurs within this block (Appendix 3).

### Built Assets

***On-reserve*** No built assets exist within this block, however it should be noted that Tapanappa Campground is located 50 m from the western boundary of this block, within Deep Creek / Tent Rock block.

### Fire Risk

It is considered *Possible* that a fire will occur within this block, given the potential ignition sources that are associated with Tapanappa Campground. It is likely that a fire within this block could escalate, due to the *Very High* to *Extreme* Overall Fuel Hazard and poor access.

### Fire Access

***Major*** Track to Tapanappa day visitor carpark (unnamed)

***Minor*** Boat Harbor Road
Track along part of the northern block boundary (unnamed)
Track from Tapanappa Campground towards the coast (unnamed)

### Specific Management Objectives for Tapanappa Block

- Ensure visitor safety.
- Ensure appropriate management in line with Ecological Fire Management Guidelines for flora, fauna and communities of conservation significance (Appendix 1, 2 and 3) and MVS (Table 2), in particular the Nationally rated MLR Southern Emu-wren and Swamps of the Fleurieu Peninsula.
- One area has been proposed for C-zone burning within this block, however the area identified may not be burnt in its entirety (i.e. the burn may itself be patchy, or the area could be divided and burnt over a number of seasons). Refer to Map 4. Prescribed burning will be implemented to:

- provide some landscape protection;
- reduce the likelihood of fire burning into adjacent blocks including Leaselands, Deep Creek/Tent Rock and Boat Harbor blocks; and
- minimise the likelihood of the whole reserve burning in single fire event.

### Proposed Zoning

- To minimise the likelihood of a fire burning into adjacent blocks and affecting more than 50% of the reserve in a single fire event apply:
  - a B-zone (minimum 80 m) along the minor track from Tapanappa Campground towards the coast
  - a B-zone (minimum 50 m) along the major track to the Tapanappa day visitor carpark and continuing through to the coast.

### Recommended Works

***Pre-suppression***

Existing:

- Most tracks are slashed on annual basis with verge trimming and grading done on a cyclical basis.

Proposed:

- Develop an Emergency Action Plan to address visitor safety during bushfires (refer to Section 5.3).
- Once new minor track is formed within Leaselands block (refer Leaselands block prescription) install a gate on the track within this block.
- Fuel reduce B-zones to the required levels.
- Prescribed burning will be undertaken in this block to (Map 4):
  - reduce fuel loads in strategic areas, to minimise the likelihood of a large fire event occurring or more than 50% of the reserve burning in a single fire event.

***Suppression***

Further to the general suppression considerations detailed in Section 9.4, suppression planning should consider:

- Safety of ground crews within the block, in regards to the limited access and the dense vegetation along the minor track in the northern section of the block.
- Visitor safety along the walking trail network such as on the Heysen Trail or Boat Harbor Trail as well as at the day visitor carpark and Tapanappa Campground (within Deep Creek/Tent Rock Block).
- Attempting suppression within the grasslands along the major track to the day visitor carpark to avoid the fire burning into adjacent dense vegetation.
- Potential for ground based suppression to be unsuccessful along the existing track network within the block, especially:
  - toward the coast; and
  - in the northern section to dense vegetation along the minor track.
- Implementing aerial support to aid in suppression if a fire is burning toward the:
  - eastern and western sections of the block, especially closer to the coast; and
  - northern section of the block.
- Using a control line in Leaselands Block if a fire cannot be contained within this block.

## BOAT HARBOR BLOCK

### Tenure, (Size), Land use

Deep Creek CP (654 ha).

### Vegetation

MVS No. 4, 8, 9, 21, 32

This block is dominated by a mixed Messmate Stringybark woodland over low shrubs. Post fire regeneration has created a mosaic of vegetation structures and densities. These range from an extremely dense Kangaroo Thorn shrubland to a dense coastal heathland, grassland, swamp, heath and dense woodland.

### Fire History

A bushfire in 1983 burnt the block in its entirety, as part of a larger fire that burnt 723 ha of the eastern section of Deep Creek CP.

### Fuel Hazard

***Overall*** Varies from *Very High* to *Extreme* due to the dense vegetation.

***Elevated*** *Very High* in the east and north.

### Natural Values

This block is considered to be the most significant block within Deep Creek CP for the Nationally *Endangered* MLR Southern Emu-wren. The Nationally *Endangered* Southern Brown Bandicoot and *Vulnerable* Kangaroo Island Spider-orchid have also been recorded within this block. Other fauna and flora of State conservation significance that have been recorded for this block are included in Appendix 1 and 2. The Nationally *Critically Endangered* Fleurieu Peninsula Swamp community also occurs within this block (Appendix 3).

### Built Assets

***On-reserve*** None.

***Off-reserve*** Forestry assets exist to the north of this block.

### Fire Risk

It is considered *Possible* that a significant fire could occur within this block, due to the fire history, subsequent regeneration of vegetation to *Extreme* overall fuel hazard levels and potential ignition sources in areas such as Boat Harbor Beach. There would be *Major* environmental consequences if a fire burnt this block in its entirety again, due to the impacts this is likely to have on species of conservation significance. The overall risk of a bushfire occurring and affecting this block has been assessed as *High.*

### Fire Access

| | |
|---|---|
| ***Major*** | Tapanappa Road |
| | McGregor Road |
| ***Standard*** | Extension of Tapanappa Road along the northern boundary (part) (unnamed) |
| ***Minor*** | Extension of Tapanappa Road along the northern boundary (part) (unnamed) |
| | Boat Harbor Road |
| | Extension of McGregor Road to the coast (part) (unnamed) |
| ***Service*** | Track along the northern boundary (unnamed) |
| | Track off extension of Tapanappa Road (unnamed) |
| | Extension of McGregor Road to the coast (part) (unnamed) |

### Specific Management Objectives for Boat Harbor Block

- Minimise the likelihood of fires leaving the reserve and impacting on adjacent properties, including the forestry assets to the north of the block.
- Reduce the likelihood of fire burning into Tapanappa or Leaselands Blocks.
- Enhance habitat for the MLR Southern Emu-wren and Southern Brown Bandicoot populations by reducing the likelihood of the block burning in its entirety in a single fire event.

- Ensure appropriate management in line with Ecological Fire Management Guidelines for flora, fauna and communities of conservation significance (Appendix 1, 2 and 3) and MVS (Table 2), in particular the MLR Southern Emu-wren, Southern Brown Bandicoot, Kangaroo Island Spider-orchid and Swamps of the Fleurieu Peninsula.

### Proposed Zoning

- Entire block designated as a C-zone.

### Recommended Works

***Pre-suppression***

Existing:

- Most tracks are slashed on annual basis with verge trimming and grading done on a cyclical basis.

Proposed:

- Develop an Emergency Action Plan to address visitor safety during bushfires (refer to Section 5.3).
- Upgrade Boat Harbor Road to a standard track.
- Two areas have been proposed for C-zone burning within this block, however the area identified may not be burnt in its entirety (i.e. the burn may itself be patchy, or the area could be divided and burnt over a number of seasons). Refer to Map 4. Prescribed burning in the C-zone will be implemented in this block to:
  - enhance habitat for the MLR Southern Emu-wren and Southern Brown Bandicoot populations;
  - monitor effects of fire on the MLR Southern Emu-wren and Southern Brown Bandicoot populations and their habitat as described in Section 10 of this Fire Management Plan;
  - implement strategic fuel reduction in the landscape and increase habitat patchiness in order to benefit the MLR Southern Emu-wren population; and
  - reduce fuel loads in strategic areas to provide some landscape protection for the block and greater reserve and also to reduce the likelihood of fires impacting on neighbours.

***Suppression***

Further to the general suppression considerations detailed in Section 9.4, suppression planning should consider:

- Inability of ground crews to enter this block during a fire, due to:
  - steep terrain;
  - *Very High* to *Extreme* fuels; and
  - dense vegetation.
- Visitor safety along the walking trail network such as on the Boat Harbor Circuit Hike Trail, the Heysen Trail and also at Boat Harbor Beach.
- Restricting fire from burning into the forestry assets to the north of the block and adjoining private property.
- Restricting ground based suppression to the perimeter tracks that are adjacent the forest reserve in the north and the east and also along Boat Harbor Road.
- Gaining access to the northern section of the block through the minor track (only under very mild conditions). This track has been identified as being potentially useful if attempting to protect MLR Southern Emu-wren habitat.
- Implementing aerial support to aid ground based suppression and increase safety for ground crews.

## WAITPINGA BLOCK

### Tenure, (Size), Land use

Waitpinga CP (3 ha).

### Vegetation

MVS No. 4, 9

Dominated by Pink Gum woodland over mid shrubs and low forbs. The vegetation within this block is very dense and there are no records of disturbance.

### Fire History

No fires have been recorded within this block.

### Fuel Hazard

***Overall*** *Very High* to *Extreme*.
***Elevated*** *High* due to very dense unmodified vegetation (generally bracken).

### Natural Values

The Nationally listed ***Endangered*** MLR Chestnut-rumped Heathwren occurs within this block, however no Nationally listed flora species have been recorded. Fauna and flora of State conservation significance are included in Appendix 1 and 2. The Nationally ***Critically Endangered*** Fleurieu Peninsula Swamp community also occurs within this block (Appendix 3).

### Built Assets

***On-reserve*** None.
***Off-reserve*** ForestrySA pine plantation to the north (Second Valley Forest Reserve).

### Fire Risk

A human-caused ignition is considered ***Unlikely*** within this block due to low visitor numbers. There is ***High*** risk that fire originating in Second Valley Forest Reserve will burn into this block. A fire originating in this block is also likely to spread into adjacent land.

### Fire Access

***Major*** Illawong Road (adjacent)
Tunkalilla Road (adjacent)

### Specific Management Objectives for Waitpinga Block

- Minimise the likelihood of fires originating in the reserve impacting on adjacent land.
- Ensure appropriate management in line with Ecological Fire Management Guidelines for flora, fauna and communities of conservation significance (Appendix 1, 2 and 3) and MVS (Table 2), in particular the Nationally rated MLR Chestnut-rumped Heathwren and Swamps of the Fleurieu Peninsula.

### Proposed Zoning

- C-zone.

### Recommended Works

***Pre-suppression***

Existing:

- None

Proposed:

- None – due to the blocks size and likelihood of fire ignition.

***Suppression***

Further to the general suppression considerations detailed in Section 9.4, suppression planning should consider:

- Priority protection for Second Valley Forest Reserve.

- Coordinated operations between ForestrySA, DEH and CFS if a fire threatens the block from Second Valley Forest Reserve or a fire threatens Second Valley Forest Reserve from the block.
- Gaining access to the northern boundary using ForestrySA tracks (unclassified).
- Using Illawong Road to the south and ForestrySA tracks to the north as control lines.
- Containment within the block is unlikely if the fire danger rating exceeds *Moderate*.

## ERIC BONYTHON BLOCK

### Tenure, (Size), Land use

Eric Bonython CP (6 ha)

### Vegetation

MVS No. 4, 8

Dominated by a Messmate Stringybark forest over tall shrubs and mid ferns. Disturbance of vegetation has not been recorded by DEH.

### Fire History

No fires have been recorded as occurring within this block.

### Fuel Hazard

***Overall*** *Very High* to *Extreme*.

***Bark*** *Very High* to *Extreme*, due to the presence of Stringybarks.

### Natural Values

The Nationally *Endangered* Osborn's Eyebright occurs within this block. No Nationally listed fauna species or ecological communities are known to occur within this block. Fauna and flora of State conservation significance are included in Appendix 1 and 2.

### Built Assets

***On-reserve*** None.

### Fire Risk

A human-caused ignition is considered *Unlikely* within this block due to low visitor numbers. There is a risk that a fire originating from adjacent land will burn into this block.

### Fire Access

***Major*** Rymill Road (adjacent)

### Specific Management Objectives for Eric Bonython Block

- Minimise the likelihood of fires originating within the block burning into adjacent land.
- Ensure appropriate management in line with Ecological Fire Management Guidelines for flora and fauna of conservation significance (Appendix 1 and 2) and MVS (Table 2) in particular the Nationally listed Osborn's Eyebright.

### Proposed Zoning

- C-zone.

### Recommended Works

***Pre-suppression***

Existing:

- None

Proposed:

- Investigate the implementation of a small prescribed burn to examine the fire response of Osborn's Eyebright and use this information to propose Ecological Fire Management Guidelines (Appendix 1). Refer to Potts (1999) and Section 10 of this Fire Management Plan for more detail.

***Suppression***

Further to the general suppression considerations detailed in Section 9.4, suppression planning should consider:

- Using the open grazing land to the north, east and west and Rymill Road to the south as control lines.
- Containment within the block is unlikely if the fire danger rating exceeds *Moderate*.

# 12 RECOMMENDATIONS

**TABLE 4 – SUMMARY OF RECOMMENDATIONS FROM THIS FIRE MANAGEMENT PLAN**

| Summary of Recommendations | |
|---|---|
| Land Use | 1. Implement fuel management strategies on DEH managed lands to minimise the risk to life, property and the environment (refer to Section 11 and Map 4 for further information). |
| Built Assets | 2. Undertake fire management works and activities on DEH reserves to minimise the impact that fire may pose to adjacent public assets. |
| | 3. Encourage adjacent property owners to comply with the *Fire and Emergency Services Act 2005* by implementing fire management works on their own land to minimise the threat of fire. |
| | 4. Implement fuel management strategies appropriate to asset protection (refer to Section 11 and Map 4 for further information). |
| | 5. Encourage volunteer participation in undertaking approved fuel reduction activities. |
| Visitor Use | 6. Implement fuel management strategies appropriate to visitor safety (refer to Section 11 and Map 4 for further information). |
| | 7. Consider reserve closures (at the discretion of the Director National Parks) and develop an Emergency Action Plan to address visitor safety during bushfires and on days of extreme fire weather. In particular this should address:<br>▪ visitor safety during bushfire incidents;<br>▪ visitor safety on *High* to *Extreme* fire danger days, especially within campgrounds, day use areas, accommodation and on walking trails; and<br>▪ an exemption for Southern Ocean Retreats from reserve closures on days of extreme fire weather, providing that they provide guests with a Bushfire Action Plan, and that this plan is sighted and endorsed annually by the District. Under this arrangement guests will be restricted to the accommodation unless approved by the District Ranger, Fleurieu. |
| Heritage Values | 8. Implement fuel management strategies for the protection of heritage values where practicable (refer to Section 11 and Map 4 for further information); |
| | 9. Ensure liaison at bushfires occurs to identify heritage values, where time allows. Once the fire has passed evaluate sites to establish if any damage has occurred; |
| | 10. Ensure suppression strategies take into account significant historical sites in order to minimise impacts from these activities and undertake post-fire rehabilitation. |

## Summary of Recommendations

| | |
|---|---|
| **Swamps of the Fleurieu Peninsula** | 11. Aim to minimise the impact of fire on Swamps, particularly the impact of high frequency fires or high intensity fires, in line with the Recovery Statement for the Swamps of the Fleurieu Peninsula (MLRSEW & FPS Recovery Team 2007c). |
| | 12. Liaise with the MLR Southern Emu-wren and Swamps of the Fleurieu Peninsula Recovery Team when planning prescribed burns in Swamp areas. |
| | 13. Use information provided by the Recovery Team during emergency situations. The Recovery Team should ensure information relating to distribution, abundance and significance of the Swamps is easily accessible and in a format suitable for use by an Incident Management Team. |
| | 14. Refer to the booklet Protecting Fleurieu Peninsula Swamps and the MLR Southern Emu-wren - A Guide for Landowners, Land Advisers, Property Planners and Developers (MLRSEW & FPS Recovery Team 2007a) for more information. |
| **MLR Southern Emu-wren** | 15. Implement strategically located prescribed burns in order to create low fuel buffers that aim to mitigate against major population losses by providing potential refuge areas and minimising the likelihood of bushfire encroaching into core population areas. |
| | 16. Use prescribed burning as an opportunity to gather new information on the fire response of the species as well as assess the proposed Ecological Fire Management Guidelines (Appendix 2). Refer to Section 10 for details on recommended research and monitoring. |
| | 17. Conduct prescribed burning to increase habitat patchiness. |
| | 18. Consult the MLR Southern Emu-wren and Swamps of Fleurieu Peninsula Recovery Team during the planning of any burn to be conducted within the known habitat of the MLR Southern Emu-wren (details on possible areas for consideration are indicated in Section 11). |
| | 19. Develop an Ecological Fire Management Strategy for the species. |
| | 20. Refer to the booklet *Protecting Fleurieu Peninsula Swamps and the MLR Southern Emu-wren - A Guide for Landowners, Land Advisers, Property Planners and Developers* (MLRSEW & FPS Recovery Team 2007a) for more information. |

## Summary of Recommendations

| | |
|---|---|
| MLR Chestnut-rumped Heathwren | 21. Implement strategically located prescribed burns to create low fuel buffers in order to minimise the risk of large contiguous areas of habitat burning in one fire event. |
| | 22. Attempt to retain some unburnt patches as refuge areas during prescribed burning and also during bushfire suppression. |
| | 23. Conduct prescribed burning to increase habitat patchiness. |
| | 24. Consult the MLR Southern Emu-wren and Swamps of Fleurieu Peninsula Recovery Team during the planning of any burn to be conducted within the known habitat of the MLR Southern Emu-wren (details on possible areas for consideration are indicated in Section 11). |
| | 25. Use prescribed burning as an opportunity to gather new information on the fire response of the species as well as assess the proposed Ecological Fire Management Guidelines (Appendix 2). Refer to Section 10 for details on recommended research and monitoring. |
| | 26. Consult with the DEH threatened species unit when planning burns in known habitat of the MLR Chestnut-rumped Heathwren. |
| Southern Brown Bandicoot | 27. Implement strategically located prescribed burns to create low fuel buffers in order to minimise the likelihood of contiguous areas of habitat burning in one fire event. |
| | 28. Attempt to retain some unburnt patches as refuge areas during prescribed burning and also during bushfire suppression. |
| | 29. Conduct prescribed burning to increase habitat patchiness. |
| | 30. Use prescribed burning as an opportunity to gather new information on the fire response of the species as well as assess the proposed Ecological Fire Management Guidelines (Appendix 2). Refer to Section 10 for details on recommended research and monitoring. |
| | 31. Develop an Ecological Fire Management Strategy for the species. |
| | 32. Consult the Southern Brown Bandicoot Recovery Team when planning prescribed burns in known bandicoot habitat. |

## Summary of Recommendations

| | |
|---|---|
| Weeds | 33. Refer to Ecological Fire Management Guidelines (Table 2 - Section 7.3) and fire management guidelines for introduced flora species (Appendix 1) during prescribed burn planning. |
| | 34. Consider the use of fire as part of an integrated weed management strategy. |
| | 35. Conduct post-fire weed control subject to regional priorities. |
| | 36. Identify the potential impact of weed species prior to any prescribed burn in prescribed burn panning, as part of the EAT. This will identify any priority weed species and recommend post-fire actions to mitigate the impact of weeds. |
| | 37. Monitor weeds pre- and post-fire to determine what post-fire weed control is required and its effectiveness. |
| | 38. Ensure hygiene practices are implemented to reduce weed spread across the plan area. |
| Pest Animals | 39. Collect relevant information in prescribed burn planning as part of the EAT on introduced fauna, to determine appropriate management post-fire. |
| Phytophthora | 40. Ensure the *Standard Operating Procedure – Phytophthora Threat Management* (SOP-002) (DEH 2002a) is adhered to in Phytophthora risk areas, which includes all the reserves in the plan area. |
| | 41. Ensure hygiene practices are implemented to reduce the spread of Phytophthora across the plan area. Refer to the *DEH Operating Procedure - Phytophthora Vehicle Disinfection Units* (DEH 2003). |
| Monitoring | 42. Investigate the fuel accumulation rates of the various MVS that occur within the plan area (Table 1). These data will help DEH staff determine if and when fuel reduction works are required, ultimately assisting in the scheduling of operational works and activities in B-zones. |
| | 43. Assess the suitability of the proposed weed management guidelines for the control of introduced species following fire, including English Broom, Blackberry and Gorse (Appendix 1). |
| | 44. Examine the appropriateness of the proposed fire interval guidelines for the Southern Brown Bandicoot, in conjunction with the Southern Brown Bandicoot Recovery Team (Appendix 2). |
| | 45. Assess the accuracy of the proposed extent and season of burn guidelines and for the MLR Southern Emu-wren, in conjunction with the MLR Southern Emu-wren and Swamps of Fleurieu Peninsula Recovery Team (Appendix 2). |
| | 46. Investigate the appropriateness of the proposed extent of burn guidelines on the MLR Chestnut-rumped Heathwren (Appendix 2). |

## Summary of Recommendations

**Research**

47. Investigate the suitability of the Ecological Fire Management Guidelines for MVS through the assessment of historical fire regimes in similar communities across the state (Table 2 – Section 7.3).

48. Explore the effects of season of burn, fire intensity and fire frequency on Southern Brown Bandicoot populations and preferred habitat structure and use this information to update the Ecological Fire Management Guidelines (Appendix 2).

49. Investigate the effects of fire intensity and fire frequency on MLR Southern Emu-wren populations and preferred habitat and use this information to update the Ecological Fire Management Guidelines (Appendix 2).

50. Examine the effects of fire regime on Swamp communities, particularly season of burn, fire frequency, fire interval and fire intensity and use this information to propose Ecological Fire Management Guidelines.

51. Research the effects of fire regime, particularly fire interval, fire frequency, season of burn and fire intensity on MLR Chestnut-rumped Heathwren populations and preferred habitat and use this information to update the Ecological Fire Management Guidelines (Appendix 2).

52. Explore the effects of fire regime, particularly season of burn, fire frequency, fire interval and fire intensity on Nationally rated flora species, including: Osborn's Eyebright *(Euphrasia collina* ssp. *osbornii)*, Kangaroo Island Spider Orchid and Clover Glycine *(Glycine latrobeana)* and use this information to propose Ecological Fire Management Guidelines.

## 12.1 Table of Recommended Works for Fire Management Blocks

The following table provides a summary of the recommendations from Section 11 (Block Prescriptions) that are to be undertaken within fire management blocks, along with a priority rating for each activity (Table 5). The priority rating provides an indication only of the recommendations that should be implemented in the coming years. This is not intended to restrict the timing or dictate the order of implementation, as this will be defined by the Region. Works are dependent on a number of variables including regional priorities, staff, resources, bushfire events (that have occurred since time of writing) and prescribed burning opportunities. There must be flexibility to reschedule as variables change and impact on the ability to implement works.

A works schedule is being developed by the Adelaide Region in tandem with this plan to include the recommendations listed in Table 5. The works schedule incorporates the suggested priority ratings and provides more detail regarding the specifics of track upgrades, fuel reduction works and prescribed burns. From the proposed works schedule, an annual works program will be developed and implemented by the Region. Individual burn plans, incorporating the EAT will be produced prior to the implementation of any prescribed burn. Post-fire assessments will be conducted and used as a basis for performance reporting against objectives.

Note: Any works off reserve should be coordinated through the District Bushfire Prevention Committee.

**TABLE 5 – RECOMMENDED WORKS FOR FIRE MANAGEMENT BLOCKS**

| | Recommended Works | Responsibility | Priority |
|---|---|---|---|
| All reserves in plan area | Develop an Emergency Action Plan to address safety across the plan area (Section 5.3). | DEH | High |
| | As part of developing the Emergency Action Plan:<br>• Update signage/information at campgrounds (e.g. on the ablution block and accommodation).<br>• Remove 'Fire Refuge' signs from all campgrounds and previously designated fire refuge areas.<br>• Reinforce CFS "stay or go early" message to visitors and the community. | DEH | High |
| | Avoid revegetation in the designated A- and B-zones (Map 4) that is likely to increase long-term fuel loads. | District | High |
| | Effects of fire on MLR Southern Emu-wren populations and habitat to be monitored in partnership with the Recovery Team (especially within Deep Creek CP). | DEH/ Recovery Team | High |
| | Effects of fire on Southern Brown Bandicoot populations and habitat to be monitored in partnership with the Recovery Team (especially within Deep Creek CP). | DEH/ Recovery Team | High |
| | Neighbours of DEH reserves will need to implement fire management strategies around their own assets to complement the recommended works in the plan area. | DBPC/ Neighbours | High |

| | Recommended Works | Responsibility | Priority |
|---|---|---|---|
| | Implement prescribed burning (within Ecological Fire Management Guidelines) to create patchiness and reduce fuel loads in the C-zone on areas marked on Map 4. Note: each burn area identified on Map 4 may not be burnt in its entirety within a season, (i.e. the burn may itself be patchy, or the area could be divided and burnt over a number of seasons). | DEH | High |
| Talisker Block | Fuel reduce A- and B-zones to the required levels. | DEH | High |
| | Carry out prescribed burning (Map 4 shows proposed areas). | DEH | High |
| | Upgrade the track to the Talisker Mine site to a service track. | DEH | High |
| Goondooloo Block | Fuel reduce A and B-zones to the required levels. | DEH | High |
| | Maintain Blowhole Beach Road as a major track. | DEH/DBPC | High |
| Deep Creek/ Tent Rock Block | Fuel reduce A- and B-zones to the required levels. | DEH | High |
| | Carry out prescribed burning (Map 4 shows proposed areas). | DEH | High |
| | Upgrade of various internal tracks from minor tracks to standard tracks. | DEH | Moderate |
| | Recommend the upgrade of Black Bullock Road from a minor track to standard track. | DBPC | High |
| Florence/ Glenburn Block | Fuel reduce A- and B-zones to the required levels. | DEH/Lessee | High |
| | Continue slashing and verge trimming program associated with ongoing track maintenance works. | DEH | High |
| Krichauff Block | Continue slashing and verge trimming program associated with ongoing track maintenance works. | DEH | High |
| | Carry out prescribed burning (Map 4 shows proposed areas). | DEH | Moderate |

| | Recommended Works | Responsibility | Priority |
|---|---|---|---|
| | Upgrade the minor track inside the reserve boundary (along Backhouse Road) to standard track with a turnaround point. | DEH | High |
| | Recommend the closure, rehabilitation and fencing of Backhouse Road between Tapanappa Road and northern point of Krichauff Block. If this cannot be achieved, recommend the upgrade Backhouse Road to a minor track and install fencing between Backhouse Road and the DEH internal fire track. | DBPC/DEH | High |
| | Fuel reduce to meet B-zone requirements between Backhouse Road and the DEH internal fire track. | DEH | High |
| | Fuel reduce A- B-zones to the required levels. | DEH/Lessee | Moderate |
| Leaselands Block | Form new minor track (minimum) on cleared land in south-east section to link Boat Harbor, Tapanappa and Deep Creek/Tent Rock Blocks. Install two gates, one on Boat Harbor Road and another on road in Tapanappa Block. | DEH | Moderate |
| | Upgrade Boat Harbor Road to a standard track | DEH | High |
| | Fuel reduce A- and B-zones to the required levels. | DEH/Lessee | High |
| Tapanappa Block | Fuel reduce B-zones to the required levels. | DEH | High |
| | Once new minor track is formed within Leaselands block (refer Leaselands block prescription) install a gate on the track within Tapanappa block | DEH | High |
| | Carry out prescribed burning (Map 4 shows proposed areas). Consult with relevant Recovery Teams where required. | DEH | High |
| Boat Harbor Block | Upgrade Boat Harbor Road to a standard track | DEH | High |
| | Carry out prescribed burning (Map 4 shows proposed areas). Consult with relevant Recovery Teams where required. | DEH | High |
| Eric Bonython Block | Investigate the possibility of a small prescribed burn for regeneration of Osborn's Eyebright. Refer to Ecological Fire Management Guidelines (Appendix 1) | DEH | Moderate |

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# 14 APPENDICES

## Appendix 1 – Fire Response of Rated and Introduced Flora Species

| Species | Common Name | EPBC Act Status | NPW Act Status | MVS No | Block/s | Life Form | Species Ecology and Fire Response | Fire Mgt Guidelines / Post-fire Mgt Recommendations | Source |
|---|---|---|---|---|---|---|---|---|---|
| *Amphibromus archeri* | Pointed Swamp Wallaby-grass | | R | 9 | W | Perennial | • Found in damp areas | # | |
| *Anogramma leptophylla* | Annual Fern | | R | 4<br>9 | DC/TR<br>TK<br>W | Annual Herb | • Fronds die in hot weather but new fronds grow annually from underground tuber | # | |
| **Asparagus asparagoides* | Bridal Creeper | | | 9 | Deep Creek | Herb | • Adults resprout following fire<br>• Flowers: August-September<br>• Extremely hot fire may impact tuber mass | • Burn in autumn after the annual shoot cohort emerges<br>• Weed control required post-fire.<br>• Spot spray any post-fire regrowth | Aus^ |
| **Asparagus declinatus* | Bridal Veil | | | | | Annual | • Adults resprout following fire<br>• Flowers: August-September<br>• Extremely hot fire may impact tuber mass | • Weed control required post-fire. | Aus^ |
| *Baumea acuta* | Pale Twig-rush | | R | 4<br>9 | DC/TR<br>W | Perennial | • Resprouting species<br>• 2 yrs to seed set<br>• 100 yrs lifespan + seedbank | • Avoid inter-fire intervals ≤ 5 years | Aus^ |
| *Baumea gunnii* | Slender Twig-rush | | R | 9 | W | Perennial | • Flowering: Spring-Summer<br>• Resprouting species<br>• 2 yrs to seed set<br>• 100 yrs lifespan + seedbank | • Avoid inter-fire intervals ≤ 5 years | Aus^ |
| *Baumea preissii* subsp. *laxa* | Lax Twig-rush | | R | 4 | DC/TR<br>EB | Perennial Herb | • Flowers: July-December | # | |
| *Blechnum nudum* | Fishbone Water-fern | | R | 4 | DC/TR<br>EB | Creeping or Erect | • Resprouting species<br>• 3 yrs to seed/ set<br>• 100 yrs lifespan + seedbank | • Avoid inter-fire intervals ≤ 6 years | Aus^ |

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NOTE: List includes species known or likely to occur within the plan area.

| Species | Common Name | EPBC Act Status | NPW Act Status | MVS No | Block/s | Life Form | Species Ecology and Fire Response | Fire Mgt Guidelines / Post-fire Mgt Recommendations | Source |
|---|---|---|---|---|---|---|---|---|---|
| *Blechnum wattsii* | Hard Water-fern | | R | 4 | DC/TR | Creeping | • Resprouting species<br>• 100 yrs lifespan + seedbank | # | |
| *Boronia parviflora* | Swamp Boronia | | R | 4<br>9 | DC/TR<br>W | Herb or Low Shrub | • Mixed response<br>• Spring-Summer flowering<br>• 3 yrs to seed set<br>• 35 yrs lifespan + seedbank | • Avoid inter-fire intervals ≤ 6 years | Aus^ |
| *Caladenia minor* | Pigmy Caladenia | | R | 4 | DC/TR<br>EB | Perennial Herb | • Little is known about the biology and ecology of this species | # | |
| *Caladenia ovata* | Kangaroo Island Spider-orchid | VU | V | 4<br>9 | BH<br>DC/TR | Perennial Herb | • Requires raked ground for regeneration | # | R |
| *Cardamine gunnii* | Spade-leaf Bitter-cress | | V | 4 | DC/TR | Perennial | • Little is known about the biology and ecology of this species | # | |
| *Cardamine paucijuga* | Annual Bitter-cress | | R | 4 | DC/TR | Erect Annual Herb | • Flowers: September-October | # | |
| *Carex inversa var. inversa* | Knob Sedge | | R | 4 | TK | Perennial | • Congeners resprout<br>• Flowers: August-April | # | |
| *Choretrum glomeratum var. chrysanthum* | Yellow-flower Sour-bush | | R | 4 | FG | Shrub | • Killed by fire<br>• Fruit: Drupe<br>• Primary Juvenile Period: 1 year<br>• Flowers throughout the year | # | Aus^ |
| *Cladium procerum* | Leafy Twig-rush | | R | 4 | DC/TR | Perennial | • Flowers: Spring | # | |
| *Correa alba var. pannosa* | White Correa | | R | 4 | DC/TR | Shrub | • Flowers: mainly April-June | # | |
| *Correa eburnea* | | | V | 4<br>9 | BH<br>DC/TR | Shrub | • Little is known about the biology and ecology of this species | # | |

Refer to Table 1 (Section 3.4.2) for MVS Names and to Section 15 of this plan for a description of the codes used within Appendices
NOTE: List includes species known or likely to occur within the plan area.

| Species | Common Name | EPBC Act Status | NPW Act Status | MVS No | Block/s | Life Form | Species Ecology and Fire Response | Fire Mgt Guidelines / Post-fire Mgt Recommendations | Source |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | TP<br>TK | | | | |
| *Crassula peduncularis* | Purple Crassula | | R | 4 | TK | Annual | • Found in marshy areas | # | |
| *Crassula sieberiana ssp. sieberiana* | Sieber's Crassula | | E | 4 | DC/TR | Perennial Shrublet | • seed regenerator<br>• 1 year to seed set | • Avoid inter-fire intervals ≤ 4 years<br>• Avoid 3 or more successive fires of low intensity | Aus^ |
| **Cytisus scoparius* | English Broom | | | | DC/TR<br>FG<br>K | | • 1 year to seed set;<br>• soil stored seed<br>• germination stimulated following fire | • Weed control needed following fire<br>• Fire kills adult plants<br>• Fire can germinate soil stored seed | R |
| *Derwentia derwentiana ssp. homalodonta* | Mt Lofty Speedwell | | E | 4 | DC/TR | Shrub | • seed regenerator<br>• 1 year to seed set | • Avoid inter-fire intervals ≤ 4 years<br>• Avoid 3 or more successive fires of low intensity | R |
| *Deyeuxia densa* | Heath Bent-grass | | R | 4 | DC/TR | Perennial Grass | • Little is known about the biology and ecology of this species | # | |
| *Diuris brevifolia* | Short-leaf Donkey-orchid | | R | 4<br>8 | BH<br>DC/TR<br>FG | Herb | • Little is known about the biology and ecology of this species | # | |
| *Drosera binata* | Forked Sundew | | R | 4<br>9 | DC/TR<br>EB<br>W | Herb | • Resprouting species<br>• Spring-Summer flowering<br>• 1 yrs to seed set<br>• 100 yrs lifespan + seedbank | • Avoid inter-fire intervals ≤ 4 years | Aus^ |
| *Drosera praefolia* | Early Sundew | | R | 4 | DC/TR<br>TK | Perennial | • Resprouting species<br>• Summer flowering<br>• 10 yrs lifespan + seedbank | # | Aus^ |
| *Eryngium* | Prostrate Blue | | R | 4 | DC/TR | Perennial | • Little is known about the biology | # | |

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NOTE: List includes species known or likely to occur within the plan area.

| Species | Common Name | EPBC Act Status | NPW Act Status | MVS No | Block/s | Life Form | Species Ecology and Fire Response | Fire Mgt Guidelines / Post-fire Mgt Recommendations | Source |
|---|---|---|---|---|---|---|---|---|---|
| *vesiculosum* | Devil | | | | K | Herb | and ecology of this species | | |
| *Euphrasia collina ssp. osbornii* | Osborn's Eyebright | EN | E | 4 | EB | Perennial | • Seed regenerator<br>• Patches of open ground are required for germination, and adequate moisture levels are required for seedling survival<br>• Seed production is copious and the soil seed bank probably survives for decades<br>• Profuse germination occurs after fire<br>• Fire is thought to be required for the recovery of populations from the seedbank<br>• There is risk of extinction if conditions do not favour germinants post-fire | # | Aus^ |
| *Gastrodia sesamoides* | Potato Orchid | | R | 4 | DC/TR | Herb | • Resprouting species<br>• Spring-Summer flowering | # | Aus^ |
| *Gleichenia microphylla* | Coral Fern | | R | 4<br>9 | DC/TR<br>EB<br>W | Creeper | • Resprouting species<br>• 2 yrs to seed set<br>• 100 yrs lifespan + seedbank | • Avoid inter-fire intervals ≤ 5 years | Aus^ |
| *Glycine latrobeana* | Clover Glycine | VU | V | 4 | TK | Perennial Herb | • Flowers: September-December<br>• Seed regenerator but may also spread from rhizomes | # | |
| *Gonocarpus micranthus ssp. micranthus* | Creeping Raspwort | | R | 4<br>8<br>9 | BH<br>DC/TR<br>EB<br>W | Herb | • 1 yr to seed set | • Avoid inter-fire intervals ≤ 4 years | Aus^ |
| *Haloragis brownii* | Swamp Raspwort | | R | 4 | DC/TR | Herb | • Flowers: October-February | # | |

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NOTE: List includes species known or likely to occur within the plan area.

| Species | Common Name | EPBC Act Status | NPW Act Status | MVS No | Block/s | Life Form | Species Ecology and Fire Response | Fire Mgt Guidelines / Post-fire Mgt Recommendations | Source |
|---|---|---|---|---|---|---|---|---|---|
| *Hydrocotyle comocarpa* | Fringe-fruit Pennywort | | R | 4 | TK | Annual | • Flowers: October-November | # | |
| *Hypericum japonicum* | Matted St John's Wort | | R | 4 | EB | Annual Herb | • Mixed response<br>• Summer flowering<br>• 2 yrs to seed set | • Avoid inter-fire intervals ≤ 5 years | Aus^ |
| *Hypolepis rugosula* | Ruddy Ground-fern | | R | 4<br>9 | EB<br>W | Perennial Herb | • Resprouting species<br>• 2 yrs to seed set | • Avoid inter-fire intervals ≤ 5 years | Aus ^ |
| *Lagenifera gracilis* | Slender Bottle-daisy | | V | 4 | DC/TR | Herb | • Little is known about the biology and ecology of this species | # | |
| *Leucopogon hirsutus* | Hairy Beard-heath | | R | 4<br>8<br>9 | BH<br>DC/TR<br>EB<br>FG<br>W | Shrub | • Flowers: August-September | # | |
| *Lycopodiella lateralis* | Slender Clubmoss | | R | 4 | DC/TR | Herb | • Widespread in wet/boggy areas<br>• Resprouting species<br>• 2 yrs to seed set<br>• 100 yrs lifespan + seedbank | • Avoid inter-fire intervals ≤ 5 years | Aus ^ |
| *Melaleuca squamea* | Swamp Honey-myrtle | | R | 4 | DC/TR | Shrub | • Mixed response<br>• Spring flowering<br>• 5 yrs to seed set<br>• 60 yrs lifespan + seedbank | • Avoid inter-fire intervals ≤ 7 years | Aus ^ |
| *Microtis atrata* | Yellow Onion-orchid | | R | 4 | DC/TR | Herb | • 1 year to seed set | • Avoid inter-fire intervals ≤ 4 years | Aus^ |
| *Microtis rara* | Sweet Onion-orchid | | R | 4 | DC/TR | Herb | • 1 year to seed set<br>• Flowering: Oct-Jan<br>• Mostly in Swamps | • Avoid inter-fire intervals ≤ 4 years | Aus^ |
| *Myriophyllum* | Broad Milfoil | | R | 4 | BH | Herb | • 1 year to seed set | • Avoid inter-fire intervals ≤ 4 years | Aus ^ |

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NOTE: List includes species known or likely to occur within the plan area.

| Species | Common Name | EPBC Act Status | NPW Act Status | MVS No | Block/s | Life Form | Species Ecology and Fire Response | Fire Mgt Guidelines / Post-fire Mgt Recommendations | Source |
|---|---|---|---|---|---|---|---|---|---|
| *amphibium* | | | | 8<br>9 | DC/TR<br>EB<br>W | | | | |
| *Nassella neesiana** | Chilean Needle Grass | | | | | Perennial Tussock Grass | • Flowers: Sept-Dec (potentially can flower year round)<br>• When established robust tussocks are known to withstand fire<br>• Seeds viable >12 years<br>• Resprouts after fire<br>• Fire stimulates germination | • Follow up weed control required post-fire | Aus ^ |
| *Phylloglossum drummondii* | Pigmy Clubmoss | | R | 4<br>9 | DC/TR<br>W | Perennial Herb | • 2 yrs to seed set<br>• Flowering: Jul-Oct | • Avoid inter-fire intervals ≤ 5 years | Aus ^ |
| *Prasophyllum australe* | Austral Leek-orchid | | R | 4 | DC/TR | Herb | • Resprouting species<br>• Spring-Summer flowering<br>• 1 yrs to seed set<br>• 60 yrs lifespan + seedbank<br>• Known to flower freely after fires | • Avoid inter-fire intervals ≤ 4 years | Aus ^ |
| *Pteris tremula* | Tender Brake | | R | 4 | DC/TR | Perennial Herb | • seed regenerator<br>• 20 yrs lifespan + seedbank | • Avoid 3 or more successive fires of low intensity | Aus^ |
| *Pterostylis bryophila* | Hindmarsh Valley Greenhood | CE | E | 4 | TK | Herb | • Flowers: May-late June<br>• 15 year lifespan<br>• Grows in moist, shady, mossy areas (eg lower slopes of gullies, along creek lines) usually with a southerly aspect.<br>• Flowering declines immediately post-fire<br>• Flowering known to increase with time since last fire | • Avoid inter-fire intervals ≤ 5 years | (Quarm by 2006) |
| *Pterostylis curta* | Blunt Greenhood | | R | 4 | DC/TR | Herb | • Resprouting species<br>• Winter-Spring flowering | • Avoid inter-fire intervals ≤ 5 years | Aus^ |

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NOTE: List includes species known or likely to occur within the plan area.

| Species | Common Name | EPBC Act Status | NPW Act Status | MVS No | Block/s | Life Form | Species Ecology and Fire Response | Fire Mgt Guidelines / Post-fire Mgt Recommendations | Source |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | • 2 yrs to seed set | | |
| *Pterostylis foliata* | Slender Greenhood | | R | 4 | DC/TR | Herb | • Often with Pink Gums<br>• Winter-Spring flowering | # | |
| *Ptilotus erubescens* | Hairy-tails | | R | 4 | DC/TR | Erect Perennial | • Resprouting species | # | Aus^ |
| *Pultenaea scabra* | Rough Bush-pea | | R | 4<br>9 | DC/TR<br>EB<br>W | Erect Shrub | • seed regenerator<br>• 4 yrs to seed set | • Avoid inter-fire intervals ≤ 7 years<br>• Avoid 3 or more successive fires of low intensity | Aus^ |
| **Rubus fruticosus* | Blackberry | | | | FG<br>G<br>K | Perennial Erect or Spreading Shrub | • 1 year to seed set<br>• readily resprouts following fire<br>• seeds distributed by birds | • Weed control needed following fire | R |
| *Schizaea bifida* | Forked Comb-fern | | V | 4 | DC/TR | Erect | • Resprouting species<br>• 2 yrs to seed set<br>• 100 yrs lifespan + seedbank | • Avoid inter-fire intervals ≤ 5 years | Aus^ |
| *Schizaea fistulosa* | Narrow Comb-fern | | V | 4 | DC/TR | Erect | • 2 yrs to seed set | • Avoid inter-fire intervals ≤ 5 years | Aus^ |
| *Schoenus laevigatus* | | | R | 4<br>9 | DC/TR<br>W | Herb | • Little is known about the biology and ecology of this species | # | |
| *Schoenus lepidosperma ssp. lepidosperma* | Slender Bog-rush | | R | 9 | W | Perennial | • Flowering: Spring-Summer<br>• 2 yrs to seed set | • Avoid inter-fire intervals ≤ 5 years | Aus^ |
| *Scutellaria humilis* | Dwarf Skullcap | | R | 4<br>9 | DC/TR<br>G<br>TK | Perennial Herb | • Flowering: July-Apr | # | Aus^ |
| *Senecio* | Broad-leaf | | V | 4 | DC/TR | Shrub | • Flowering: Oct-Jan | # | SA^ |

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NOTE: List includes species known or likely to occur within the plan area.

| Species | Common Name | EPBC Act Status | NPW Act Status | MVS No | Block/s | Life Form | Species Ecology and Fire Response | Fire Mgt Guidelines / Post-fire Mgt Recommendations | Source |
|---|---|---|---|---|---|---|---|---|---|
| *odoratus var. obtusifolius* | Scented Groundsel | | | 9 | | | | | |
| *Sphaerolobium minus* | Leafless Globe-pea | | R | 4 | DC/TR TK | Shrub | • Seed regenerator<br>• Spring flowering<br>• 3 yrs to seed set | • Avoid inter-fire intervals ≤ 6 years<br>• Avoid 3 or more successive fires of low intensity | Aus^ |
| *Sprengelia incarnata* | Pink Swamp-heath | | R | 4<br>8<br>9 | BH<br>DC/TR W | Erect Shrub | • Mixed response<br>• Winter-Spring flowering<br>• 2 yrs to seed set<br>• 35 yrs lifespan + seedbank | • Avoid inter-fire intervals ≤ 5 years | Aus^ |
| *Spyridium spathulatum* | Spoon-leaf Spyridium | | R | 4<br>8<br>9<br>32 | DC/TR G TP | Shrub | • Little is known about the biology and ecology of this species | # | |
| *Stylidium beaugleholei* | Beauglehole's Trigger-plant | | R | 4 | DC/TR | Annual Herb | • Little is known about the biology and ecology of this species | # | |
| *Thelymitra flexuosa* | Twisted Sun-orchid | | R | 4 | DC/TR | Herb | • Mixed response<br>• Spring flowering<br>• 1 yrs to seed set | • Avoid inter-fire intervals ≤ 4 years | Aus^ |
| *Thelymitra mucida* | Plum Sun-orchid | | R | 4 | DC/TR TK | Herb | • Flowering: Sept-Dec | # | SA^ |
| *Viminaria juncea* | Native Broom | | R | 4<br>8<br>9 | BH<br>DC/TR W | Erect Shrub | • Seed regenerator<br>• Flowering: Nov-Feb<br>• 3 yrs to seed set<br>• 55 yrs lifespan + seedbank | • Avoid inter-fire intervals ≤ 6 years<br>• Avoid 3 or more successive fires of low intensity | Aus^ |
| *Xanthosia tasmanica* | Southern Xanthosia | | R | 4<br>9 | DC/TR W | Perennial Herb | • 2 yrs to seed set<br>• Flowers: Sept-Oct | • Avoid inter-fire intervals ≤ 5 years | Aus^ |
| *Xyris operculata* | Tall Yellow-eye | | R | 4<br>9 | DC/TR W | Perennial | • Resprouting species<br>• Spring-Summer flowering | • Avoid inter-fire intervals ≤ 4 years | Aus^ |

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NOTE: List includes species known or likely to occur within the plan area.

| Species | Common Name | EPBC Act Status | NPW Act Status | MVS No | Block/s | Life Form | Species Ecology and Fire Response | Fire Mgt Guidelines / Post-fire Mgt Recommendations | Source |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | • 1 yrs to seed set<br>• 100 yrs lifespan + seedbank | | |
| **Ulex europaeus* | Gorse | | | | TK<br>TP | Shrub | • 1 year to seed set;<br>• Soil stored seed<br>• Germination stimulated following fire | • Weed control needed following fire<br>• Fire kills adult plants<br>• Fire can germinate soil stored seed | R |

Refer to Table 1 (Section 3.4.2) for MVS Names and to Section 15 of this plan for a description of the codes used within Appendices
NOTE: List includes species known or likely to occur within the plan area.

## Appendix 2 – Fire Response of Rated Fauna Species

| Type | Species | Common Name | EPBC Act Status | NPW Act Status | MVS No | Block/ s | Diet | Breeding | Species Ecology and Fire Response | Fire Management Guidelines | Source |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Bird | *Calyptorhynchus funereus* | Yellow-tailed Black-Cockatoo | | V | 849 | BH DC/TR EB FG K L W | G | • Sites: hollows high in trees<br>• Material: woodchips<br>• Season: Jul-Jan | • Nomadic or locally migratory<br>• Higher intensity fire can increase hollow loss<br>• Favours eucalypt woodland and pine plantations (Aleppo Pine)<br>• Fire likely to impact the availability of food sources (seeds) | • Minimise loss of hollows (avoid high intensity fire)<br>• Minimise the loss of important feeding sites & critical habitat (including Aleppo Pine stands)<br>• Consideration should be given to replacement food sources if introduced pines are impacted by fire | Aus^ |
| Bird | *Falco peregrinus* | Peregrine Falcon | | R | 49 | DC/TR W | C | • Sites: rock crevices, cliffs<br>• Material: rock<br>• Season: Aug-Nov | • Fire will influence the availability of prey species within home ranges<br>• The same nesting sites may be used for many years<br>• Pairs will maintain a home range approximately 20-30 $km^2$ | • Reduce the likelihood of extensive bushfires | Aus^ |
| Bird | *Haliaeetus leucogaster* | White-bellied Sea-Eagle | | V | 49 | DC/TR W | C | • Sites: high in tree, or ledges/cliffs<br>• Material: sticks, leaves<br>• Season: May-Oct | • Volant<br>• Coastal habitat<br>• Uses same nest for years<br>• High mobility | # | Aus^ |
| Bird | *Hylacola pyrrhopygia parkeri* | MLR Chestnut-rumped | EN | V | 49 | DC/TR W | I | • Sites: on ground, or in a low bush or | • Prefers heaths, low density thickets in forests, woodlands.<br>• In pairs or small groups | • > 50% of habitat patch should not burn in single fire event | Aus^ |

Refer to Table 1 (Section 3.4.2) for MVS Names and to Section 15 of this plan for a description of the codes used within Appendices
NOTE: List includes species known or likely to occur within the plan area.

| Type | Species | Common Name | EPBC Act Status | NPW Act Status | MVS No | Block/ s | Diet | Breeding | Species Ecology and Fire Response | Fire Management Guidelines | Source |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Heathwren | | | | | | tussock<br>• Material: dome shaped - grasses, fine bark & feathers<br>• Season: Jul-Nov | • Sedentary<br>• High risk of population loss due to bushfire | | |
| Bird | *Pandion haliaetus* | Osprey | | R | 9 | W | C | • Sites: tree canopy or rock cliff face overlooking the sea<br>• Material: sticks, driftwood & seaweed<br>• Season: Jul-Sept | • Volant<br>• Inhabits borders of rivers, lakes, inlets of coasts and small islands lying off-shore<br>• Lives singly or in pairs<br>• High mobility | # | Aus^ |
| Bird | *Stagonopleura bella* | Beautiful Firetail | | R | 49 | DC/TRW | G | • Sites: within thick foliage of a bush or tree<br>• Material: bottle-shaped of grass & leaves<br>• Season: Sept-Jan | • Sedentary to moderately mobile<br>• High risk of population loss due to bushfire | • > 50% of habitat patch should not burn in single fire event. | Aus^ |
| Bird | *Stipiturus malachurus intermedius* | MLR Southern Emu-wren | EN | E | 48932 | DC/TRBHFGGTP | I | • Sites: in a grass tuft or low bush close to the ground<br>• Material: oval shaped composed of | • Occupy wet and dry heaths, along the coast & at high altitude<br>• Require low, dense vegetation for shelter (mainly sedges & shrubs), foraging, nesting & dispersal | • > 50% of habitat patch should not burn in single fire event<br>• The Recovery Team supports the use of small scale (up to 10 hectares) prescribed | R |

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NOTE: List includes species known or likely to occur within the plan area.

| Type | Species | Common Name | EPBC Act Status | NPW Act Status | MVS No | Block/s | Diet | Breeding | Species Ecology and Fire Response | Fire Management Guidelines | Source |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | grass<br>• Season: Aug-Mar (most young hatch Sept-Dec) | • Usually in pairs or small groups<br>• Uncommon to rare throughout their range<br>• Sedentary and almost flightless<br>• Forage close to the ground<br>• Home range ~1 ha<br>• At risk of being extirpated by fire, due to their limited dispersal capabilities and habitat requirements<br>• Only take short term refuge in small unburnt areas<br>• Can occupy regenerating habitat only if a suitable source population occurs in nearby unburnt habitat that is adequately protected | burns in Deep Creek CP in autumn to early winter. | |
| Bird | *Turnix varia* | Painted Button-quail | | V | 49 | DC/TRW | GI | • Sites: terrestrial, under some vegetation within a depression.<br>• Material: grass acting as a hood & lined with finer grass<br>• Season: Sept-May | • Found within open forests and heaths<br>• High risk of population loss due to bushfire<br>• Low mobility | • > 50% of habitat patch should not burn in single fire event. | Aus^ |
| Bird | *Zoothera lunulata* | Bassian Thrush | | R | 4 | DC/TR | I | • Sites: tree forks or tree stumps<br>• Material: cup shaped of bark strips, leaves, grasses, moss & rootlets | • Prefers dense vegetation and moist gullies<br>• Sedentary but dispersive<br>• Risk of population decline due to bushfire | • > 50% of habitat patch should not burn in single fire event for > 50% of patches | Aus^ |

Refer to Table 1 (Section 3.4.2) for MVS Names and to Section 15 of this plan for a description of the codes used within Appendices
NOTE: List includes species known or likely to occur within the plan area.

| Type | Species | Common Name | EPBC Act Status | NPW Act Status | MVS No | Block/ s | Diet | Breeding | Species Ecology and Fire Response | Fire Management Guidelines | Source |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | • Season: Jul-Dec | | | |
| Mammal | *Isoodon obesulus* | Southern Brown Bandicoot | EN | V | 4 | BH DC/TR | | • Sites: burrows or understorey vegetation<br>• Material: soil & leaves<br>• Season: late winter to summer | • Home range of 1 ha to 6 ha<br>• Inhabits heathland, shrubland, dry sclerophyll forest with heathy understorey, sedgeland and woodland.<br>• At least some individuals are capable of surviving low intensity fires<br>• Some indication that the species prefers early seral stages but this is not supported by all research<br>• Higher fire intensity may threaten isolated populations<br>• Occurs in areas of dense understorey which is probably required to provide protection from predators | • Mosaic of post-fire vegetation is desirable (diversity and structural)<br>• Avoid inter-fire intervals ≤ 7 years<br>• Some inter-fire intervals > 15 years desirable. | R Aus^ |
| Reptile | *Egernia cunninghami* | Cunningham's Skink | | V | 4 32 | DC/TR G TP | I H | • Sites: rock crevices<br>• Season: late summer | • Occupy home ranges<br>• Normally found in crevices in rock formations<br>• Likely to find refuge in these areas during a fire<br>• Early successional species<br>• Frequent fire likely to impact the availability of food sources within home ranges | • Reduce the likelihood of extensive bushfires<br>• Reduce the likelihood of frequent fires within known habitat | Aus^ |
| Reptile | *Eulamprus heatwolei* | Yellow-bellied Water Skink | | R | 4 | DC/TR G TP | I C | • Sites: rock crevices | • Ground-dweller<br>• Prefers moist habitats in warm river valleys and Swamps<br>• May find refuge within rock crevices during a fire | • Reduce the likelihood of extensive bushfires<br>• Reduce the likelihood of frequent fires within known habitat | Aus^ |

Refer to Table 1 (Section 3.4.2) for MVS Names and to Section 15 of this plan for a description of the codes used within Appendices
NOTE: List includes species known or likely to occur within the plan area.

## Appendix 3 – Fire Response of Rated Ecological Communities

| Ecological Community | EPBC Act Status | Block | MVS No | Occurrence | Fire Response | Fire Management Guidelines | Source |
|---|---|---|---|---|---|---|---|
| Swamps of the Fleurieu Peninsula | CE | G<br>DC/TR<br>FG<br>L<br>K<br>BH<br>TP<br>W | 4<br>8<br>9<br>32 | Localised wetlands occurring in high rainfall areas of the Fleurieu Peninsula | • Frequent and/or high intensity fire may have a negative impact on Swamps.<br>• Disturbance is important in the maintenance of floristic and structural heterogeneity in some Swamps.<br>• An absence of disturbance may result in the dominance of one or two native species and in the absence of further management weeds may also invade.<br>• Swamp vegetation regenerates quickly following a controlled burn, with increases in both biomass and plant species richness.<br>• Burning may promote increased structural and floristic richness provided it does not severely impact the peat substrate. | • Avoid burning more than 10% of all known Fleurieu Peninsula Swamps in any one year.<br>• Avoid burning more than 50% of any single Fleurieu Peninsula Swamp in a 10 year period.<br>• Avoid burning swamps during periods of increased soil dryness.<br>• Refer to the booklet *Protecting Fleurieu Peninsula Swamps and the MLR Southern Emu-wren - A Guide for Landowners, Land Advisers, Property Planners and Developers* (MLRSEW & FPS Recovery Team 2007a) for more information. | E<br>Aus^ |

## 15 SUMMARY OF CODES USED IN APPENDICES

### Block Codes

| Code | Block | Reserve |
|---|---|---|
| BH | Boat Harbor | Deep Creek Conservation Park |
| DC/TR | Deep Creek/Tent Rock | Deep Creek Conservation Park |
| EB | Eric Bonython | Eric Bonython Conservation Park |
| FG | Florence/Glenburn | Deep Creek Conservation Park |
| G | Goondooloo | Deep Creek Conservation Park |
| K | Krichauff | Deep Creek Conservation Park |
| L | Leaselands | Deep Creek Conservation Park |
| TK | Talisker | Talisker Conservation Park |
| TP | Tapanappa | Deep Creek Conservation Park |
| W | Waitpinga | Waitpinga Conservation Park |

### Other Codes Used

| NPW ACT STATUS | | EPBC ACT STATUS | | DIET OF RATED FAUNA SPECIES | |
|---|---|---|---|---|---|
| E | Endangered | EX | Extinct | C | Carnivore or scavenger. Mainly vertebrates. |
| V | Vulnerable | CE | Critically Endangered | H | Herbivore. Includes folivores, grazers and browsers. |
| R | Rare | | | N | Nectar feeder |
| | | EN | Endangered | I | Insectivore/"arthropodivore"/omnivore |
| | | VU | Vulnerable | G | Granivore. Typically peak in abundance after a fire event in fire-adapted vegetation, due to the stimulation of flowering and subsequent seed-set. |

| MISCELLANEOUS CODES | |
|---|---|
| # | Fire response is unknown or ambiguous, thus the required data is not available to propose Ecological Fire Management Guidelines. When data becomes available the table will be updated. |
| * | Introduced species |

| FIRE RESPONSE SOURCE | |
|---|---|
| R | Regional or local data |
| SA | South Australian data |
| Aus | Interstate data |
| ^ | Data/observations derived from published or unpublished literature. |
| E | Expert opinion (person knowledgeable in species genera) |
| I | Inferred from similar species (Senior Fire Ecologist - Fire Management Branch has inferred based on other species genera) |

## 16 GLOSSARY OF ACRONYMS AND FIRE MANAGEMENT TERMINOLOGY

| Term | Definition |
|---|---|
| **Backburn(ing)** | A fire started intentionally along the inner edge of a control line to consume the fuel in the path of a bushfire. |
| **Bushfire** | An unplanned fire. A generic term that includes grass fires, forest fires and scrub fires. |
| **CFS** | The South Australian Country Fire Service. |
| **Control line** | A natural or constructed barrier, or treated fire edge, used in fire suppression and prescribed burning to limit the spread of fire. |
| **DEH** | The South Australian Department for Environment and Heritage. |
| **DEH (Cwlth)** | The Commonwealth Department of Environment and Heritage. |
| **Direct attack** | A method of bushfire attack where wet or dry firefighting techniques are used. It involves suppression action right on the fire edge, which becomes the control line. |
| **Discontinuous fuels** | Significant gaps between clumps or patches of fuel (DEH 2006g) |
| **DBPC** | District Bushfire Prevention Committee. |
| **EAT** | DEH Environmental Assessment Table. Completed for all prescribed burns (as part of the Prescribed Burn Plan) and other fire management works where native vegetation is being cleared and is not exempt under the *Native Vegetation Act 1991* (DEH 2004). |
| **EPBC Act** | The commonwealth *Environment Protection and Biodiversity Conservation Act 1999.* |
| **Extreme fire behaviour** | A level of bushfire behaviour characteristics that ordinarily precludes methods of direct suppression action. One or more of the following is usually involved: high rates of spread; prolific crowning and/or spotting; presence of fire whirls and/or a strong convective column. Predictability is difficult because such fires often exercise some degree of influence on their environment and behave erratically, sometimes dangerously. |
| **Fine fuels** | Grass, leaves, bark and twigs less than 6mm in diameter. |
| **Fire access track** | A track constructed and maintained expressly for fire management purposes. |
| **Fire behaviour** | The manner in which a fire reacts to the variables of fuel, weather and topography. |
| **Firebreak** | An area or strip of land where vegetation has been removed or modified to reduce the risk of fires starting and reduce the intensity and rate of spread of fires that may occur (GAFLC 2005). |
| **Fire danger** | The combination of all factors, which determine whether fires start, spread and do damage, and whether and to what extent they can be controlled. |
| **Fire danger rating** | A relative number denoting an evaluation of rate of spread, or suppression difficulty for specific combinations of fuel, fuel moisture, temperature, humidity and wind speed. The rating can be *Low*, *Moderate*, *High*, *Very High* or *Extreme*. |

| Term | Definition |
|---|---|
| **Fire management** | All activities associated with the management of fire-prone land, including the use of fire to meet land management goals and objectives. |
| **Fire regime** | The history of fire in a particular vegetation type or area including the fire frequency, interval, intensity, extent and seasonality of burning (Brooks *et al.* 2004). |
| **Fire scar** | A destructive mark left on a landscape by fire. |
| **Fire season** | The period(s) of the year during which fires are likely to occur, spread and do sufficient damage to warrant organised fire control. |
| **Fire suppression** | The activities connected with restricting the spread of bushfire following its detection and making it safe. |
| **Fuel** | Any material such as grass, leaf litter and live vegetation, which can be ignited and sustains a fire. Fuel is usually measured in tonnes per hectare. |
| **Fuel arrangement** | A general term referring to the spacing and arrangement of fuel in a given area. |
| **Fuel hazard** | The overall fuel hazard is defined as the sum of the influences of bark fuel, elevated fuel and surface fine fuel (DEH 2006g) |
| **GAFLC** | South Australian Government Agencies Fire Liaison Committee. |
| **IBRA** | Interim Biogeographical Regionalisation for Australia. |
| **Incident Controller (IC)** | The individual responsible for the management of all incident operations and IMT. |
| **IMT** | Incident Management Team. The group of incident management personnel comprising the Incident Controller and the people he/she appoints to be responsible for the functions of Operations, Planning and Logistics. |
| **Indirect attack** | The use of backburning as a method of suppression to confine the fire within a defined area bounded by existing or prepared control lines. Control lines may be a considerable distance ahead of the fire. |
| **Key Fire Response Species** | In this Fire Management Plan, these are the species most susceptible to decline due to inappropriate fire regimes: either too frequent or too infrequent fire, low or very high intensity fire, or fire in a particular season. |
| **MLR** | Mount Lofty Ranges. |
| **NPW Act** | The South Australian *National Parks and Wildlife Act 1972*. |
| **NVC** | Native Vegetation Council. Established under the provisions of the *Native Vegetation Act 1991*, responsible for making decisions on a wide range of matters concerning native vegetation in South Australia (DWLBC 2006). |
| **'Of conservation significance'** | In this plan, used to describe important or rated populations or species of flora and fauna as well as vegetation communities. These may be:<br>• Nationally listed as Threatened (with a rating of Extinct, Critically Endangered, Endangered, Vulnerable or Conservation Dependent) under the federal EPBC Act;<br>• South Australian listed as Threatened (with a rating of Endangered, Vulnerable or Rare) under the NPW Act, *Revised Schedules 7*, *8* and *9*.<br>• Provisionally listed as Threatened (with a rating of Endangered or Vulnerable) in South Australia, that is, included on the unpublished DEH Provisional List of Threatened Ecosystems of South Australia (DEH 2005b). |

| Term | Definition |
|---|---|
| **Patchiness** | Spatial variability of the area burnt (e.g. stands of varying ages after a fire rather than single-aged regrowth stands) (Ooi *et al.* 2006). Low intensity fires tend to be patchier than high intensity fires within a particular vegetation type and topographic features, such as rocky outcrops and slope, are likely to increase fire patchiness by reducing fuel continuity (Ooi *et al.* 2006). |
| **Prescribed Burn Plan** | The plan, which is approved for the conduct of prescribed burning. It contains a map identifying the area to be burnt and incorporates the specifications and conditions under which the operation is to be conducted. |
| **Prescribed burning** | The controlled application of fire under specified environmental conditions to a predetermined area and at the time, intensity, and rate of spread required to attain planned resource management objectives. It is undertaken in specified environmental conditions. |
| **Response plan** | A plan detailing the response for a risk or an area including the type and number of resources. |
| **Resprouter** | Mature plants that survive fire and regenerate from regenerative buds underground (e.g. lignotubers, rhizomes), on the stem (e.g. epicormic buds) or in the crown (Attiwill and Wilson 2003). |
| **Retardant** | A chemical generally mixed with water, designed to retard combustion by chemical or physical action. It is usually applied by aircraft but may be applied from tankers at the fire edge. |
| **Risk assessment** | Used in DEH fire planning to assist in evaluating the threat to life, property and environmental assets posed by bushfire and also to aid in developing strategies and implementing actions and works for risk mitigation. Considers *Likelihood* and *Consequence* to determine an overall risk rating using a matrix as *Low*, *Moderate*, *High*, *Very High* or *Extreme* (DEH 2006l). |
| **Spotting** | The ignition of spot fires from sparks or embers. |
| **Seeder** | Mature plants that are killed by fire and regenerate by seed (Attiwill and Wilson 2003). |
| **Total Fire Ban** | A ban on lighting and maintaining of a fire in the open, which can be invoked at any time during the year. When invoked, the Total fire Ban is imposed for a period of 24 hours, from midnight to midnight, but may also be imposed for part of a day or days (Country Fire Service Regulations, 2003). |
| **TPC** | The *Threshold of Potential Concern* (TPC) is defined as a point in time where *Key Fire Response Species* are likely to be affected by an aspect of fire regime. |
| **'Weed of national significance'** | 20 priority weeds that pose future threats to primary industries, land management, human or animal welfare, biodiversity and conservation values at a national level. These weeds were identified and ranked through the assessment of invasiveness, impacts, potential for spread and socioeconomic and environmental aspects (Australian Weeds Committee 1999). |

*Unless otherwise indicated, definitions for fire management terminology were adapted from (DEH 2006e)*

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