Clarence City Council

Bushfire Management Plan

Rosny Hill Reserve
Rosny

Revised
January 2017
Clarence City Council

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PROJECT TEAM

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1. Introduction

This Bushfire Management Plan (BMP) is a revision and expansion of the previous BMP for Rosny Hill Nature Recreation Area Reserve prepared by AVK Environmental Management.

Clarence City Council has been responsible for the management of the reserve since 30th September 2009, when it was transferred from the Tasmanian Parks and Wildlife Service (PWS). This plan will operate for 5 years after which a review and revision is recommended.

It should be noted that this BMP is not an operations plan and does not deal directly with response to bushfires. Operational procedures are dealt with in various documents prepared by the Tasmania Fire Service (TFS) and other emergency services.

1.1 Aim

The aim of this BMP is to provide a framework for bushfire management that meets Clarence City Council's land management objectives for the site, as set out in Council's *Bushfire Management Strategy for Council Owned and Controlled Land*, *Bushfire Management Strategy - Best Management Practice Guidelines* and Strategic Plan.

It must be noted that it will not be possible to prevent bushfires occurring in the reserve. Unless these fires are suppressed quickly, there is a risk that large destructive fires may develop. Depending on weather conditions, such fires may burn a substantial portion of the bushland in the reserve causing damage to assets and environmental values, and even loss of life. This BMP aims to lessen these risks by minimising the risk of fires starting in the reserve, and minimising the risk of injury or damage to assets in and surrounding the reserve.

This plan also provides for the use of fire as a management tool to:

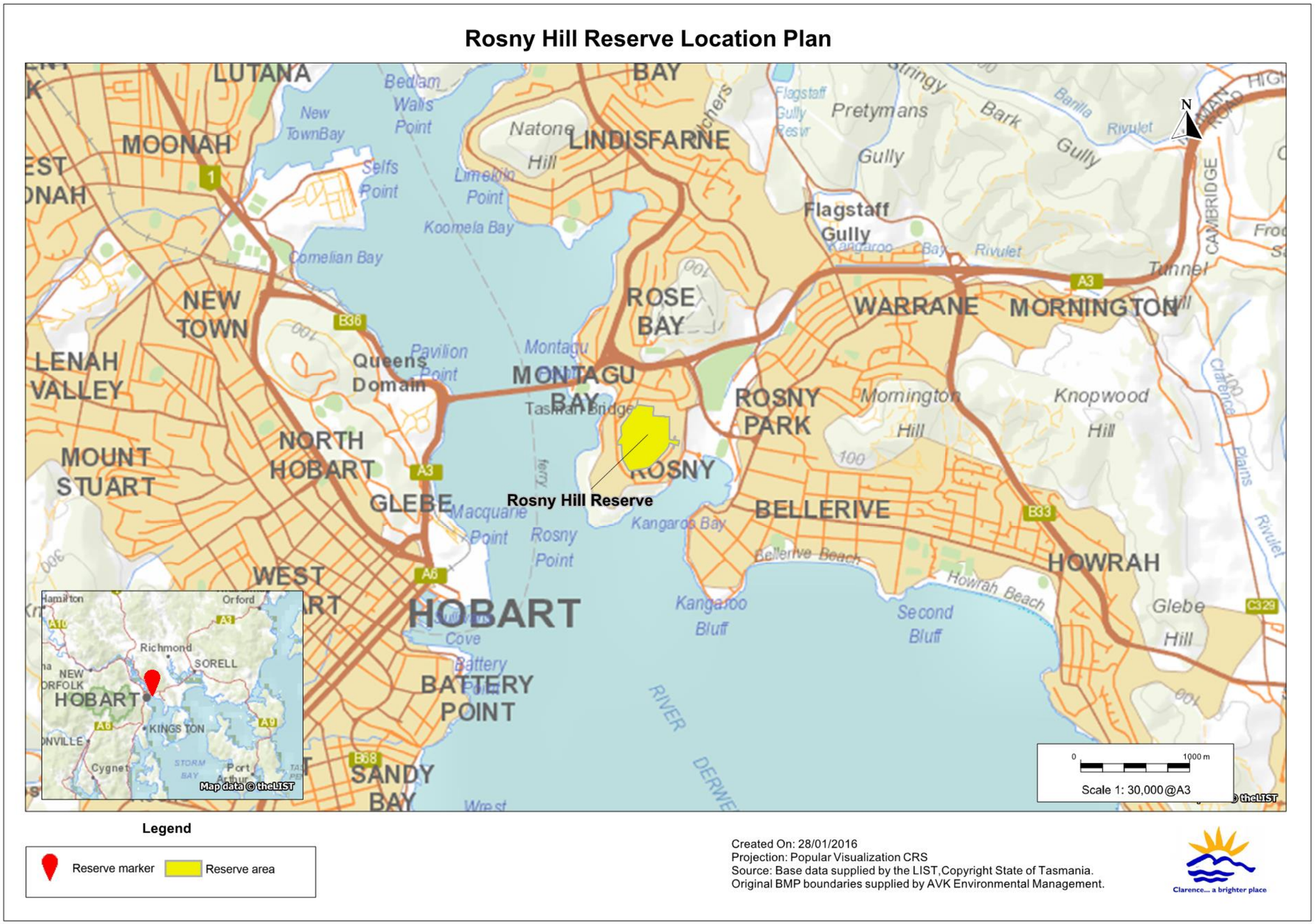
- Target area for maximum risk reduction
- reduce bushfire hazard to protect assets from bushfires
- maintain the long-term viability of the native vegetation in the reserve
- Assist in the removal of weeds and the regeneration of degraded bushland.

1.2 Location and Description

Rosny Hill Reserve is located in a residential area in the suburb of Rosny (see figure 1). The reserve is 21.4 ha in size, roughly circular in shape, and is located on a prominent round hill rising to approximately 100m. The reserve is part of a scenic rim of low tree covered hills on the foreshores of the Derwent River that provides a high level of visual amenity along the main tourist route of the Tasman Highway, and contributes significantly to the scenic appeal of the Hobart/Clarence region.

Rosny Hill Reserve has been mapped as a bushfire-prone area under the *Clarence Interim Planning Scheme 2015.* Any future developments within or adjacent may require a Bushfire Risk Assessment and a Bushfire Hazard Management Plan.

Figure 1 – Location of the Reserve



Legend

Reserve marker | Reserve area

Created On: 28/01/2016
Projection: Popular Visualization CRS
Source: Base data supplied by the LIST,Copyright State of Tasmania.
Original BMP boundaries supplied by AVK Environmental Management.

Clarence... a brighter place

1.2.1 Geology and Soils

The geology of the reserve consists of Jurassic dolerite and related rocks, and is considered a representative example of the dolerite geology and soils that characterises much of south-eastern Tasmania (de Gryse, 1997).

Soils in the reserve consist of undefined brown soils (non calcic brown soils) with a texture varying from loam to clay loam near the surface to heavy clay at depth. This soil type generally has a low to moderate erosion risk.

1.2.2 Vegetation

The major vegetation communities in the reserve are shown in figure 2. Vegetation types and community boundaries within the reserve are based on TASVEG 3.0 mapping, checked and modified where required following a survey of the reserve. The reserve contains shrubland, grassy woodland and grassland mainly *Allocasuarina verticillata* forest (NAV) but also *Eucalyptus viminalis* grassy forest and woodland (DVG) and *Bursaria - Acacia* woodland and scrub (NBA). Most of the grassland in the reserve is lowland *Themeda* grassland (GTL) but there is also a small patch of lowland grassland complex (GCL).

No vegetation types within the reserve are listed as threatened native vegetation communities under the *Nature Conservation Act 2002*.

Council fire and bushland crew have been heap burning dead vegetation throughout the reserve periodically since 2010.

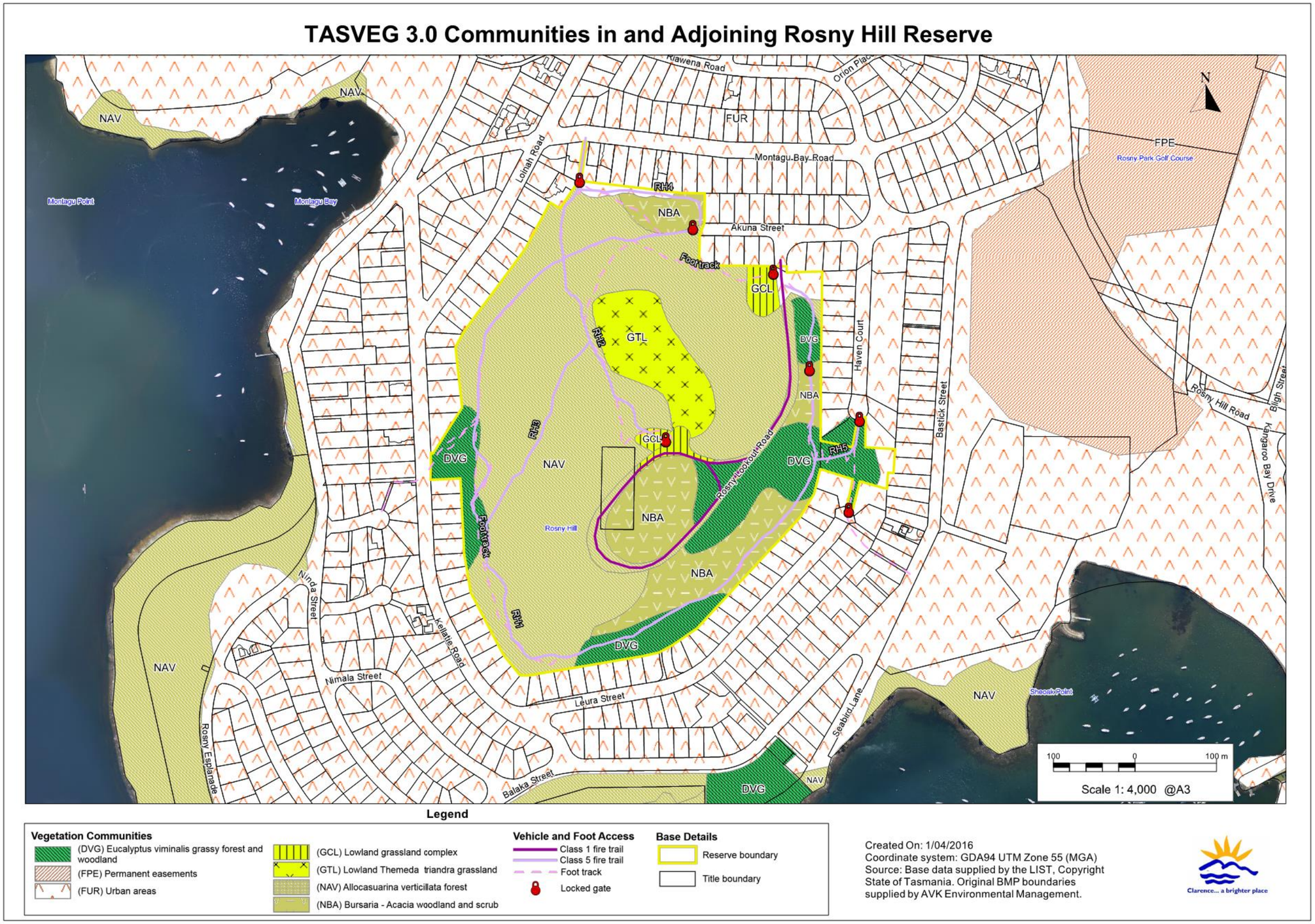
1.2.3 Reserve Usage

Kearon 1994 notes that a 1946 aerial photo of the area now covered by the reserve shows that it was cleared and grazed with the vegetation consisting of grassland with scattered sheoak.

The reserve is currently a popular tourist destination due to its panoramic views of Hobart. This is facilitated by a sealed road leading to a car park at the summit that allows 24-hour access. Tourist visitation is likely to be of short duration and confined to the car park as there are no tourist facilities in the reserve. There was evidence of antisocial activities at the summit car park including rubbish dumping and burnouts which would further discourage tourists from staying in the reserve for any length of time.

The network of tracks in the reserve is used regularly by Councils Fire Crew for bushland operations and local residents for such activities as; walking, jogging, dog exercising, orienteering, bird watching and 23 years of conservation activities by Rosny Land Care Group.

Figure 2 – Vegetation Types in the Reserve



1.3 Bushfire Management Objectives

Bushfire management within the Rosny Hill Reserve will meet the following broad management objectives:

1. Protection of life, assets and adjoining property from bushfire
2. Minimise the risk of bushfires starting and spreading in the reserve
3. Protection and enhancement of the ecological and visual values provided by the reserve
4. Protection of infrastructure and cultural heritage values within the reserve
5. Recovery, maintenance and enhancement of vegetation communities and fauna habitat within the reserve
6. Minimisation of soil loss resulting from bushfires, or bushfire management activities.

The actions recommended to attain each of these objectives are listed in section 5.1.

1.4 Reserve Management Responsibilities

Management of the reserve is the responsibility of the Clarence City Council and the TFS is responsible for suppressing bushfires within the reserve. Clarence City Council has a responsibility under the *Fire Service Act (1979)* to take all reasonable precautions to prevent any fire lit on their property from spreading onto neighbouring property. This BMP will help to fulfil that "duty of care".

Clarence City Council engaged Inspiring Place to develop a Rosny Hill Nature Recreation Area Management Strategy for Rosny Hill Reserve adopted by Council on 25 July 2011. This document has been in place since August 2011 and will run until 2021.

2. Bushfire Risks

Extreme bushfire conditions can occur in southern Tasmania when dry winters and springs are followed by summers where fuels are very dry. Under these conditions, fires can be expected to move quickly under the influence of strong, dry, north-westerly winds, and then move more or less at right angles on a broad front when the subsequent south-westerly wind change arrives. Fires that start under these conditions can reach a very high intensity, even in areas with relatively low fuel loads, and are very difficult to control until the weather conditions abate.

2.1 Bushfire History (1997-2015)

The most recent bushfire within the reserve was in February 2008; ignition was determined to be arson by a child and burnt 5.2^{ha} within VMU 3. Bushfire history from 1997 until 2015 within the reserve is shown on figure 3.

Data supplied by the TFS showed that during the last BMP the TFS attended one incident within the reserve, being a vehicle fire near the Akuna Street entrance in November 2012. The cause was determined to be malicious activity.

There has been a significant decrease in fire related incidents within the reserve since Clarence City Council took over management of Rosny Hill in September 2009. This is believed to be due to the combination of frequent planned burning by Council and increased Council presence.

2.1.1 Planned Fires

The first TFS documented planned burn within the reserve was in 1997; however the first Reserve Management Plan for Rosny Hill (de Gryse, 1997) noted that planned burns had been carried out in the reserve in 1989 and 1990.

Figure 3 – Bushfire and TFS Incident History (1997-2015)

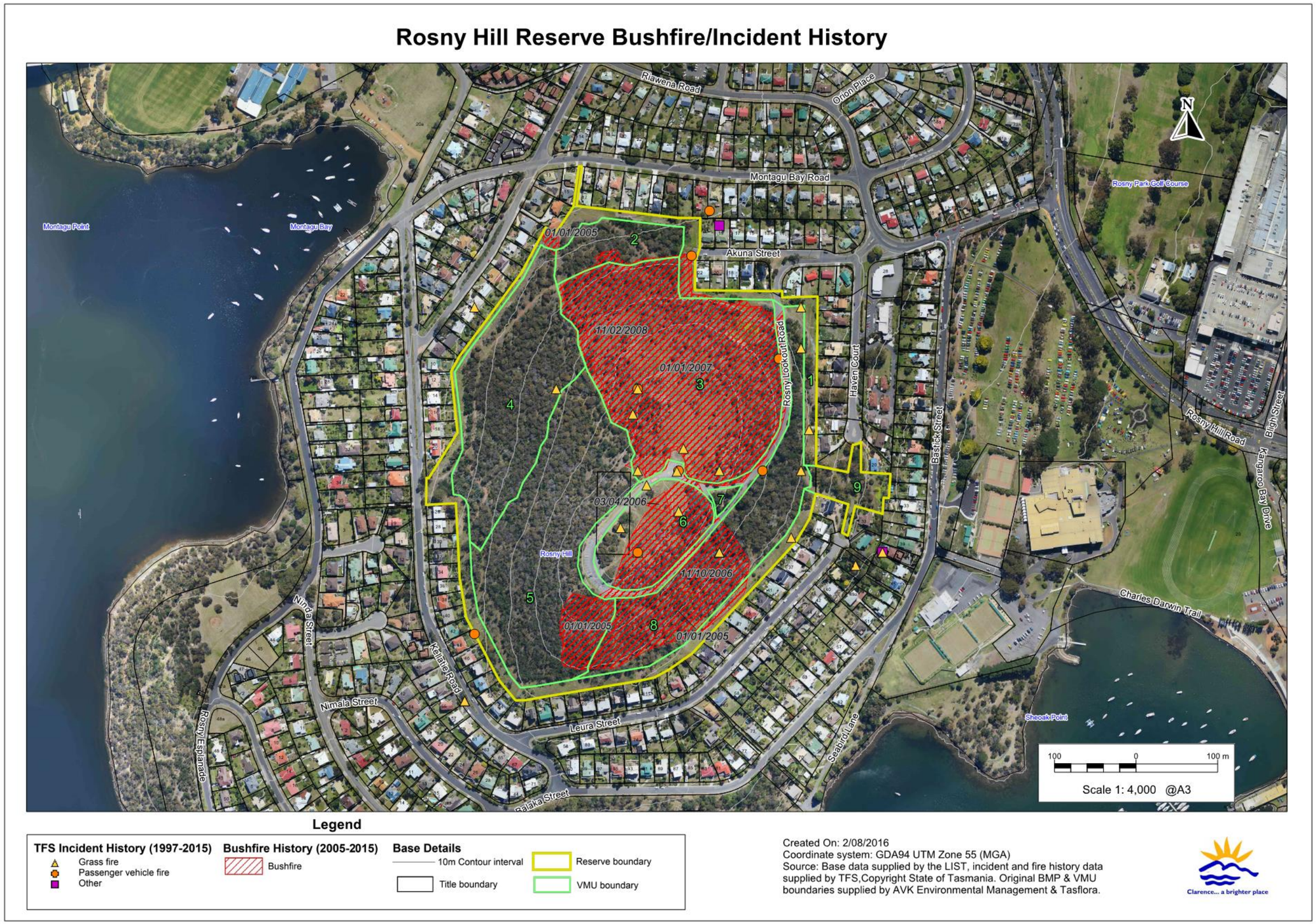
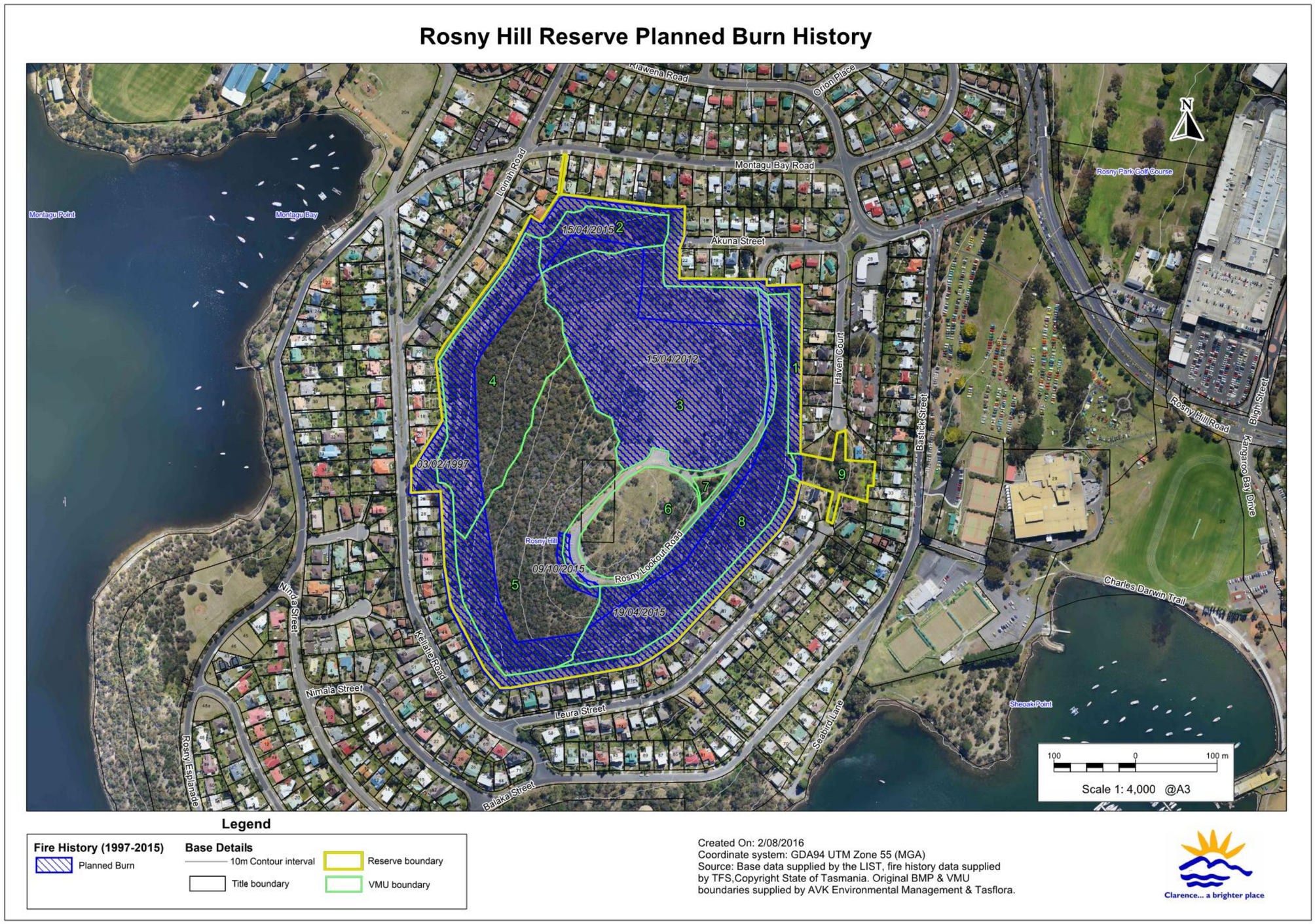


Figure 4 – Planned Burning History (1997-2015)



Fuel Types and Hazard Levels

The higher the intensity of a bushfire the greater its destructiveness and the more difficult it is to control. As the intensity of a bushfire increases it becomes progressively more difficult to contain and suppress the bushfire. Very high intensity (> 4000 kW/m heat output at the fire front) fires with flame heights greater than 10m are generally uncontrollable (NSW Rural Fire Service, 1997). Although grass fires rarely attain a very high intensity, they can move much faster than forest fires, thereby making them difficult to contain.

Bushfire intensity is a function of the heat content of the fuel, the quantity (load) of fuel, and the rate of spread of the bushfire. The heat content of vegetation fuels is roughly constant, and rate of spread is largely a function of slope and weather conditions (wind speed and relative humidity). It has been found that the quantity and distribution of fine fuels are the main factor influencing bushfire behaviour. Larger fuels burn during a bushfire but do not contribute significantly to the spread of a bushfire (NSW Rural Fire Service, 1997).

Fine fuels consist dead of plant matter less than 6mm in diameter and live plant matter less than 2mm in diameter (including grasses, bracken, leaves, bark, and twigs and branches) (Marsden-Smedley, 2009). Fine fuel load (measured in tonnes per hectare) has therefore been used as a convenient measure of the underlying bushfire hazard in areas dominated by woody vegetation. The fine fuel load at any given time is a balance between the rate of fuel build-up, and factors that remove fuel, such as litter decomposition and bushfire. In the absence of bushfire, fuel loads in forests and woodlands with a shrubby or heathy understorey build up to a quasi-equilibrium state where the rate of fuel production equals the rate of decomposition. The maximum levels vary for different vegetation types and also for the same vegetation types in different locations (Conroy, 1988). The time taken to reach equilibrium fuel loads also varies, ranging from about 2 years in some native grasslands to about 20 to 40 years in dry eucalypt forests (Marsden-Smedley, 2009).

However, it has been found that the fuel structure is possibly more important than the total fine fuel load in determining bushfire behaviour (Marden-Smedley, 2009). The time taken to reach equilibrium fuel loads also varies, ranging from about 2 years in some native grasslands to about 20 to 40 years in dry eucalypt forests (Marsden-Smedley, 2009).

However, it has been found that fuel structure is possibly more important than the total fine fuel load in determining bushfire behaviour (Marden-Smedley, 2009). Fuel in forests, woodlands and shrublands can be categorised into four layers with differing effects on bushfire behaviour (Hines et al., 2010). These layers are:

- **Surface fine fuel**; leaves, bark, small twigs and other fine fuel lying on the ground. These fuels provide the horizontal continuity that allows a bushfire to spread.
- **Near surface fine fuel**; grasses, low shrubs, bracken etc. up to about 0.5 m above the ground surface. Fuels in this layer will burn when the surface fuel layer burns and will increase bushfire intensity.

- **Elevated fuels**; larger shrubs and small saplings with most of the fuel closer to the top of this layer and a clear gap between them and the surface fuels. These interact with the two lower fuel layers to further increase bushfire intensity. They also contribute to the vertical continuity of fuel that allows fire to 'climb' into the tree canopy.
- **Bark fuels**; flammable bark on trees, saplings and large bushes from ground level to the canopy. Loose fibrous bark on stringy-bark eucalypts, and candle bark on some gums can generate large amounts of burning embers which can start spot fires ahead of the main fire front.

Canopy fuels are not usually included in fuel hazard assessments in forests and woodlands, but are included in shrubland and heath fuel types where they are equivalent to elevated fuels. If there is sufficient fuel in the lower fuel layers to start the canopy fuel burning (called a crown fire) fire intensity can increase considerably. Crown fires in forests are generally considered uncontrollable (Luke and McArthur, 1986).

The main fuel factor that influences the rate of spread of a bushfire is the quantity of near surface fuel whereas total fine fuel load is the main factor influencing fire intensity (Gould et al 2007).

In grasslands and grassy woodlands the degree of curing (dryness) of the fuel is considered at least as important as the actual fuel load (Cheney and Sullivan, 2008). Grass goes through an annual cycle with new growth in spring drying out over summer. The bushfire hazard in grassland areas is greatest when the grass is fully cured which usually occurs during the period from December to April depending on seasonal breaks and significant summer rainfall events. However, grasslands that are not grazed or slashed over winter can burn in spring if cured grass from the previous growing season is still present.

Unlike bushland dominated by woody plants, grasslands can accumulate fuel very rapidly, and therefore burning is not a very effective method of hazard reduction. As grass fuel decomposes faster than eucalypt leaves and twigs, and is more likely to be eaten by herbivores, fuel loads in grasslands and grassy woodlands can fluctuate from year to year (Cheney and Sullivan, 2008).

Fuel loads can be roughly categorised in terms of the potential threat they pose as follows:
Low - < 5 tonnes per hectare
Moderate - 5 to 15 tonnes per hectare
High - >15 tonnes per hectare.

The characteristics of each fuel type in Rosny Hill Reserve are given in table 1. The TASVEG 3.0 codes of the vegetation types in figure 2 corresponding to each fuel type are listed under the fuel type.

Table 1– Characteristics of the different fuel types in the reserve

FUEL TYPE	FUEL HAZARD CHARACTERISTICS	BUSHFIRE BEHAVIOUR AND CONTROL
Grassy forest / woodland DVG	Canopy, near surface and surface fuel all present, bark fuels only present on roughed barked trees and shrubs. Moderate to high fuel loads in scattered sections on western side of reserve. Moderate fuel loading on eastern side post planned burn in 2015. Dead limb wood is a large component of fuel throughout. Grass cover generally sparser and lower in height than in open grassland. Leaf and bark fall from trees contributes to a gradual build-up of fuel, particularly around the base of trees. Grass component of the fuel load can build up fuel rapidly after a bushfire.	Can burn with moderate to high intensity depending on the degree of fuel build-up. Significant ember attack on structures and spotting across containment lines can be expected. Capable of carrying a bushfire at any time of year if there is a sufficient amount of litter on the ground, and/or cured grass. Tree cover is generally too sparse to sustain a crown fire, however, the eucalypts, particularly old hollow trees and those with rough bark, will be a source of burning embers which can carry a bushfire over nearby fire control lines (roads, fuel breaks) and threaten nearby buildings. Hazard reduction burning is effective in removing accumulated litter and the bark fuels largely responsible for spotting, but grass fuels can be replenished within a year after a burn.
Shrubland NAV NBA	Moderate overall fuel loads, predominantly elevated and bark fuels. High proportion of the fuel finely divided and elevated up to 4m. Relatively low surface and near surface fuel loads except where the shrub cover is sparse.	Where shrub canopies touch, shrubland can sustain a running crown fire of high intensity on days of extreme bushfire weather that would be difficult to control. Dense thickets are difficult to access. Significant ember attack on nearby structures and spotting across containment lines can be expected. Difficult to prescribe burn in cool weather due to low surface and near surface fuel loads.
Unmanaged grassland GTL GCL	Native and introduced grasses, near surface and surface fuels present. Potential for dense elevated fuels to about 1m high following wet winters and springs. Flammability dependant on degree of curing of the grass. Grass fuels can be replenished within a year after a burn.	Can generate rapidly moving, moderate intensity fires in late summer and early autumn. Fires can occur at other times of the year if the cured standing crop from the previous year's growth persists. Likely to be relatively little spotting so fires can usually be stopped at roads and firebreaks, however, fires may be uncontrollable in extreme conditions.
Managed vegetation (perimeter outer zone)	Surface, near surface and some bark fuel present. Generally low overall fuel loads. Grass and shrubs generally less than 200 mm in height due to periodic slashing. Leaf and bark fall from scattered trees contributes to a gradual build-up of fuel, particularly around the base of trees. Section on western side high fuel loading due to dumping of garden waste.	Will burn with low intensity unless there has been a lot of fuel accumulation or the near surface fuels have not been slashed. Capable of carrying a bushfire at any time of year if there is a sufficient amount of litter on the ground, and/or cured grass. Tree cover is generally too sparse and fuel loads too low to sustain a crown fire. Fires in this fuel type are unlikely to spot over control lines and will be relatively easy to control.

In general, fuel loads in the reserve are averaging 5-10$^{t/ha}$. Some small areas where fire has been excluded have large build-up of dead limb wood with fuel loading up to 10-15 $^{t/ha}$.

Northern facing slope has moderate fuel loading where understorey is mostly grassy. The grassy component of the fuel load means that in relatively wet years fuel loads can build up rapidly. It also means that fuel loads will build up quickly following a bushfire, limiting the effectiveness of any hazard reduction burning. Thinning and heap burning of standing sheoaks and limb wood on western and southern slopes has created a mosaic of minimal fuel compositions.

2.2 Bushfire Threat and Risk to Persons

The main bushfire threat to the reserve is considered to come from fires that start on the north and western slopes of the hill on days with north to north-westerly winds and very high or greater fire danger ratings. There is potential for fires under these conditions to burn the whole of the reserve.

Most usage of the reserve is concentrated at the summit car park; though it is unlikely persons would be trapped in this area due to the small size of the reserve and easy access to surrounding safe areas either by car or on foot.

2.3 Assets at Risk from Bushfire

Assets potentially at risk from bushfire include; dwellings, infrastructure, and other items (such as ornamental and regeneration plantings) which would cost money to replace; as well as items of scenic, cultural and natural heritage value which could be damaged or destroyed by bushfire, or bushfire suppression activities. Each landowner has an obligation to reduce a bushfire hazard where it is a threat to neighbouring properties. However, even with extensive hazard reduction burning, the risk of high intensity bushfires occurring in the reserve cannot be eliminated. Therefore, consideration must be given to protection measures that will reduce the risk of bushfire damage to assets in and surrounding the reserve. Assets within and surrounding the reserve that are considered at risk from bushfires are shown in Figure 5.

2.3.1 Bushfire Risk to Natural Heritage Assets

The conservation value of the plant communities in Rosny Hill Reserve is given in table 2. A number of plant species of conservation value occur within the reserve (see figure 5). These are listed in table 3 along with their response to bushfire if known. The swift parrot (*Lathamus discolor*) has been recorded in the reserve (de Gryse, 1997). The habitat requirements and preferred bushfire management of this species is given in table 4.

The *Natural Values Atlas* identifies no confirmed observations, but potential habitat present for the following species: eastern barred bandicoot (*Perameles gunnii*), spotted-tail quoll *(Dasyurus maculatus)*, green and gold frog *(Litoria raniformis)*, chaostola skipper *(Antipoda chaostola)*, tussock skink *(Pseudemoia pagenstecheri)*, Tasmanian devil *(Sarcophilus harrisii)*, masked owl *(Tyto novaehollandiae)*, forty-spotted paradalote *(Paradalotus quadragintus)* and grey goshawk *(Accipiter novaehollandiae)* within the reserve.

The most significant natural asset in the reserve is one of Tasmania's four only known populations of the leafy sun orchid (*Thelymitra bracteata*). Previous observations of this species were confined to the crest of the hill within the loop road (VMU 6). Observations had been recorded in 2003 and 2009, the species was not found during 2007 and 2008 despite searches during flowering periods. The location also includes a dense mix of tall grasses including introduced species that are likely to be choking the orchids. These grasses should be subject to some form of biomass reduction (burning or slashing) to reduce the competition and allow the orchids to persist.

A survey undertaken in November 2016 (Quarmby 2016) extended this species range from within the loop road (VMU 6) to also include populations extending over 200 metres down slope on the north and west facing slopes of VMU 3 and VMU 5 (figure 5). These populations were found to cover an area of approximately 3.8 ha, comprising of scattered patches of plants as well as isolated individuals.

Table 2– Conservation values of native plant communities

TASVEG 3.0 CODE	EQUIVALENT FLORISTIC COMMUNITY[1]	Conservation Status[2]
DVG	DRY-gVIM Grassy *E viminalis* woodland	Not threatened
GCL	Various floristic associations	Not threatened
GTL	Various floristic associations	Not threatened
NAV	DRY-in VERT Inland *A. verticillat*a low forest	Not threatened
NBA	None described	Not threatened

1. Forest Practices Authority (2005)
2. *Nature Conservation Act 2002*

Figure 5 – Assets at Risk from Bushfire

Table 3- Plant species of conservation value and preferred bushfire management

SPECIES	CONSERVATION STATUS[1]	OCCURRENCE	RESPONSE TO BUSHFIRE AND MANAGEMENT	*ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999* (EPBC Act) STATUS
Rytidosperma indutum tall wallaby grass	Rare	Recorded through sheoak forest likely to be widespread.	Likely to regenerate from rootstock and establish from seed after bushfires.	Not threatened
Austrostipa nodosa spear grass	Rare	Localised to native grassland on north facing slope.	Likely to regenerate from rootstock and establish from seed after bushfires.	Not threatened
Dianella amoena grassland flax lily	Rare	Two patches of plants observed in November 2016 (Quarmby 2016). Previously known from a record of a single plant.	Regenerates from rootstock. Bushfire frequency can be moderately high in native habitat.	Endangered
Lepidium pseudotasmanicum shade peppercress	Rare	10 plants recorded in sheoak forest. Likely to occur at additional sites in similar habitat.	Regenerates, sometimes prolifically, from seed after bushfire.	Not threatened
Thelymitra bracteata leafy sun orchid	Endangered	Previously confined to the crest of the hill inside the road circle. In 2009 a total of 75 plants were recorded (Mark Wapstra pers. comm.). Survey in November 2016 increased species distribution extending down slope 200 metres on the north and west facing slopes of Rosny Hill. In 2016 a total of 195 plants were recorded (Quarmby 2016).	Will regenerate from rootstock. Bushfire frequency in its habitat is moderately high. The main threat to this species at Rosny Hill is the being swamped by grassy and herbaceous weeds and by woody weeds in the longer term. Regular biomass reduction through burning or slashing is recommended. Will generally respond positively to summer fires outside the seed setting.	Not threatened
Vittadinia muelleri narrow leaf New Holland daisy	Rare	Previous records form Rosny Hill. A small patch of just 8 plants located. Potential for more populations.	Regenerates from seed after fires, benefits from disturbance that creates bare ground.	Not threatened

1. Tasmanian *Threatened Species Protection Act* 1995

Table 4- Fauna of conservation value and preferred bushfire management

SPECIES	CONSERVATION STATUS[1]	HABITAT AND PREFERRED BUSHFIRE MANAGEMENT	*ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999* (EPBC Act) STATUS
Lathamus discolor Swift parrot	ENDANGERED	Known to breed in Meehan Range east of Pilchers Hill and likely to nest elsewhere. Nests in hollows in old growth eucalypts (Brereton, 1997). Blue gums (*Eucalyptus globulus*) provide a preferred foraging habitat although swamp gums (*E. ovata)* are recognised as being particularly important as an alternative nectar source. Neither species occurs naturally in the reserve, although there are some planted trees in a traffic island near the top of the hill. The swift parrot feeds in the tree canopy and therefore an extensive, high-intensity fire that scorched the canopy could reduce the potential food resources for this species within a reserve. However, a temporary loss of food resources in a reserve due to a localised bushfire is unlikely to have a significant impact on regional food sources for this species. **Management should aim to avoid crown damage to larger trees by keeping planned burns at a low intensity and reducing the bushfire hazard to reduce the intensity of bushfires.**	ENDANGERED

1. Tasmanian *Threatened Species Protection Act* 1995

The fire sensitivity and flammability ratings of the vegetation types in the reserve according to Pyrke and Marsden-Smedley (2005), is given in table 5.

Table 5– Fire attributes of the native vegetation

TASVEG 3.0 CODE	FIRE SENSITIVITY	FLAMMABILITY
DVG	Low	High
NBA	Low	High
NAV	Low	Moderate
GTL	Low	High
GCL	Low	High

Flammability classification of Tasmanian vegetation (Pyrke & Marsden-Smedley, 2005)

FLAMMABILITY	CRITERIA FOR FLAMMABILITY
Very high	Will burn readily throughout the year even under mild weather conditions, except after recent rain (i.e. less than 2–7 days ago).
High	Will burn readily when fuels are dry enough but will be too moist to burn for lengthy periods, particularly in winter. Fuels will be dry enough to burn on most days from late spring to early autumn.
Moderate	Extended periods without rain (i.e. two weeks at least) and/or moderate or stronger winds are required for these communities to burn.
Low	These communities will burn only after extended drought (i.e. four weeks without rain) and/or under severe fire weather conditions (i.e. forest fire danger index > 40).

Note: recently burnt stands of low or moderate flammability classes may have a higher flammability rating.

Fire sensitivity classification of Tasmanian vegetation (Pyrke & Marsden-Smedley, 2005)

FIRE SENSITIVITY	ECOLOGICAL IMPACT OF BUSHFIRE	MANAGEMENT RECOMMENDATIONS
Extreme	Any bushfire will cause either irreversible or very long-term (> 500 years) damage.	Suppress all bushfire. Highest priority for bushfire suppression.
Very high	A single bushfire will cause significant change to the community for 50–100 years and will increase the probability of subsequent fires changing the community permanently.	Suppress all bushfire. High priority for bushfire suppression.
High	A bushfire-adapted community requiring at least 30 years between fires to maintain the defining species. Bushfire intervals greater than 80 years are required to reach mature stand structure.	Suppress all bushfire, but give higher priority to stands burnt less than 80 years ago.
Moderate	A bushfire-adapted community requiring at least 15 years between fires to maintain the defining species.	Suppress fires in stands burnt less than 20 years ago.
Low	Highly bushfire-adapted or non-native vegetation. A single bushfire will generally not affect biodiversity, although repeated short intervals (i.e. < 10 years) may cause long- term changes.	Suppression usually not an ecological priority except in specific situations (e.g. a recently burnt stand of a threatened species).

The low fire sensitivity of the native vegetation in the reserve indicates that it is highly fire adapted and a single fire will generally not adversely affect biodiversity, though repeated fires at intervals of less than 10 years may cause long-term changes in floristics and vegetation structure (Pyrke & Marsden-Smedley 2005). The moderate to high flammability rating of the native bushland in the reserve in Pyrke & Marsden-Smedley (2005) indicates that the bushland in the reserve will burn readily when fuels are dry but may be too moist to burn for long periods during winter. Fuels will generally be dry enough to burn on most days from late spring to early autumn.

2.3.2 Bushfire and Habitat Management

The main bushfire risk to natural heritage assets in the reserve is from bushfires that burn the whole of the reserve as well as fire regimes (planned or unplanned) that are outside the thresholds within which a particular plant community, or habitat for flora and fauna species, has viability in the long-term. Fire regimes within the thresholds of a particular plant community will help maintain its long-term viability, whereas fire regimes outside the thresholds are likely to lead to progressive changes in the structure and floristics of the plant community, and loss of habitat for the fauna favouring that plant community.

High intensity bushfires that burn the whole of the reserve can damage or destroy valuable fauna habitat including:

- tree hollows used as nests and dens by many birds and arboreal mammals
- mature, senescing or dead trees that can be important invertebrate, bird and reptile habitat, and take a long time to replace.
- understorey species that provide nest and shelter sites as well as a food source for many bird and mammal species.
- Fallen logs, bark and leaf litter that provide shelter and a food source for invertebrates, frogs, reptiles, birds and mammals.

Species may be lost from the reserve if they cannot recolonise from nearby areas, or survive in unburnt patches.

Bushfires often stimulate the spread of environmental and other weeds. However, some weed species provide significant protection and food sources for fauna (for example, gorse and blackberry) and removal of these species should be carefully managed to ensure they are progressively replaced by equivalent native species habitat.

Planned burning of the native vegetation in the reserve at the optimum frequency for its long-term viability is considered the best way to conserve important habitat for both flora and fauna in the reserve. Planned burning in a mosaic pattern along with maintenance of fire trails is the best way to minimise the risk of a bushfire burning the whole of the reserve. The bushfire management requirements of the different plant communities/habitats in the reserve are given in table 6. These plant communities have been grouped together according to their bushfire management requirements.

Table 6- Bushfire management requirements of the plant communities in the reserve

TASVEG 3.0 MAPPING UNITS	BUSHFIRE IMPACTS AND BUSHFIRE MANAGEMENT AIMS
Grassy dry sclerophyll forests and woodlands	
DVG – *Eucalyptus viminalis* grassy forest and woodland	Infrequently burnt sites develop a dense shrubby understorey. Kangaroo grass (*Themeda triandra*) can die out after an extended absence of bushfire, or other method of biomass reduction (Lunt & Morgan, 1998). Frequent fires (< 5 years) can inhibit tree regeneration and eliminate the shrubby component Sites overlying dolerite and other more fertile soils have markedly more rapid rates of regeneration than low fertility soils derived from mudstone and sandstone. Extended absence from bushfire can result in build-up of fuel causing hot and damaging burns. A temporal and spatial mosaic-burning pattern would assist with tempering the effects of a devastating bushfire. **Optimal bushfire frequency is 5-20 years on fertile sites.** **Clear vegetation around base of eucalypts periodically and heap burn to reduce canopy suppression when occurring.**
Non eucalypt forests/woodlands	
NBA –*Bursaria / Acacia* woodland and shrub	This community is typically derived from eucalypt woodland. It is a degradation phase often associated with extended periods of moderate to high intensity grazing. Fire regimes will influence the nature of regeneration. Important to allow for a period of absence from bushfire where eucalypts can re-establish if desired. **Optimal bushfire frequency is 5-20 years.** **Clear vegetation around base of eucalypts periodically and heap burn to reduce canopy suppression when occurring.**

TASVEG 3.0 MAPPING UNITS	BUSHFIRE IMPACTS AND BUSHFIRE MANAGEMENT AIMS
NAV – *Allocasuarina verticillata* Forest	Extended absence of fires leads to a closed canopy and a dense litter layer that has a low density and diversity of ground layer species, although it may be important for invertebrate species. Frequent low intensity fires benefit *Allocasuarina verticillata* over the adjacent eucalypt dominated communities (Kirkpatrick, 1985). Tendency to exclude bushfire for visual impact reasons in foreshore environments risks the long-term loss of regenerative age classes and the ultimate decline of this community in favour of grassland. Alternate methods of facilitating natural regeneration through localised clearance may be a more suitable method. **Preferred bushfire interval in inland reserves is between 15-25 years.** **Clear vegetation around base of eucalypts periodically and heap burn to reduce canopy suppression when occurring.**
Grasslands	
GTL – Lowland Themeda grassland GCL – Lowland grassland complex	Bushfire intervals > 5 years may lead to a loss of biodiversity in grassy sites (Lunt & Morgan, 1988). Frequent fires (< 5 year intervals) may lead to a loss in diversity of invertebrates. Low fire sensitivity and high flammability – appropriate bushfire interval 3-50 years. Suppression not usually an ecological priority except in specific situations (Pyrke & Marsden-Smedley 2005). **Burn grassland on Rosny Hill to open up tussocks and to ensure grassland is not closed out by encroaching shrubs. Monitor regrowth of sheoak and control by manual thinning if required.**

2.3.3 Bushfire Risk to Built and Cultural Assets

During the BMP review process Aboriginal Heritage Tasmania (AHT) completed a requested search of the Aboriginal Heritage Register (AHR) regarding the area inside the BMP boundary. There are no known Aboriginal heritage sites within the reserve.

The only infrastructure in the reserve likely to be damaged by bushfire is interpretive signage at the summit carpark and Kellatie Road foot entrance.

The main built assets at risk from bushfire are the buildings and infrastructure in the residential areas that surround the reserve.

The degree of bushfire danger at any particular time is a combination of fine fuel quantity, slope, and the prevailing weather conditions. The actual risk of a bushfire causing damage to an asset is a function the degree of danger, the probability of a bushfire igniting, and any measures taken to prevent the bushfire causing damage.

The four major modes of attack by bushfires that can cause damage to assets are:

1. wind-blown burning debris
2. radiant heat which can ignite flammable materials ahead of the fire front and shatter glass
3. flame contact
4. Strong winds generated or intensified by the bushfire.

The potential for damage to buildings in the path of large fires burning out of the reserve will depend largely on:

- whether the bushfire will approach upslope or downslope
- the quantity and distribution of fuel surrounding the building
- whether they are defended during the bushfire
- their design
- if the building was constructed to Australian Standard 3959-2009, *Construction of Buildings in Bushfire-prone Areas*
- How well they have been maintained.

The Australian Standard for Construction of buildings in bushfire-prone areas (AS:3959 – 2009) uses a Fire Danger Index (FDI) of 50 to determine the Bushfire Attack Level (BAL) for buildings that need to comply with the standard. An FDI of 50 is the boundary between Very High and Severe Fire Danger Rating.

There is insufficient data available to assess the likelihood of a high intensity bushfire starting in the reserve; however there is sufficient fine fuel within the reserve to sustain a high intensity bushfire on days of extreme fire danger.

The bushfire risk to the built and cultural heritage assets within and surrounding the reserve has been assessed using a procedure adapted from the National Emergency Risk Assessment Guidelines (NEMC, 2010). The assessment process is explained in section 5.4 of *Clarence City Council Bushfire Management Strategy for Council Owned and Controlled Land*, and the results and proposed management strategies are shown in table 7. This assessment process has been analysed and meets compliance with AS/NZS IOS:31000-2009. Note that the assessment in table 7 only considers the risk from fires starting in, or passing through the reserve. Some assets may face a greater bushfire risk from nearby bushfire hazards that are not under the control of Clarence City Council. An asset may not be directly damaged by bushfire but may be damaged by bushfire management and bushfire suppression activities, such as constructing fire control lines. These risks are noted under "other risks". During the 2016-2021 review no assets have been noted under "other risks".

NOTE: It was not possible to inspect assets on properties adjoining the reserve. The risk assessment therefore makes the following assumptions about these assets:

- Landowners/residents have established and are maintaining a defendable space to TFS specifications around vulnerable assets, either wholly within the lot, or up to the boundary with the reserve where there is insufficient space within the lot. Where this is not the case the asset may face a much higher bushfire risk than indicated in the risk assessment.
- All dwellings adjoining the reserve are well maintained to resist attack by wind-blown burning embers. Where this is not the case the asset may face a much higher bushfire risk than indicated in the risk assessment.

The management strategies recommended in table 7 will reduce the existing bushfire risk to built and cultural assets but in most cases will not eliminate it. Active protection of an asset during a bushfire can greatly reduce the bushfire risk. Assets at medium and high risk of damage from bushfire will need to be protected during planned burns in the reserve.

Table 7- Bushfire risk assessment for built and cultural assets

RISK CATEGORIES

LOW – asset of low value or considered to have a low risk of damage from bushfires in the reserve due to its construction, location, or protection measures already in place.

MODERATE – asset is vulnerable to damage by bushfires and could face attack by a moderate to high intensity bushfire, but has features that will reduce the intensity of the fire attack, or provide some protection from fires. Further bushfire protection measures are required.

HIGH – asset is of high value, is vulnerable to damage by bushfires and could face attack by a high intensity bushfire with few, if any, features that would reduce the intensity of fire attack. Further bushfire protection measures are required.

MP refers to Management Procedures in *Clarence City Council Bushfire Management Strategy – Best Management Practice Guidelines

ASSET AT RISK	RISK ANALYSIS (See section 5.4 of the Bushfire Management Strategy)								OTHER BUSHFIRE RISKS	PROPOSED MANAGEMENT STRATEGIES
	A	B	C	D	E[1]	F	G	Level of Risk		
Dwellings bordering the reserve at 21 and 22 Akuna Street.	4	2	3	2	2	1	6	576 Moderate		Maintain a minimum 20 m outer zone along the reserve boundary on the western sides of these properties with fine fuel loads less than 5 tonnes per hectare. See MP 6 in the Best Management Practice Guidelines. Advise residents of the need to maintain an adequate defendable space around their dwellings.
Dwellings bordering the reserve at 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54 and 56 Kellatie Road.	4	2	2	2	2	1	6	384 Moderate		Maintain a minimum 15 m wide outer zone along the reserve boundary adjoining these properties with fine fuel loads less than 5 tonnes per hectare. See MP 6 in the Best Management Practice Guidelines. Advise residents of the need to maintain an adequate defendable space around their dwellings.

ASSET AT RISK	RISK ANALYSIS (See section 5.4 of the Bushfire Management Strategy)								OTHER BUSHFIRE RISKS	PROPOSED MANAGEMENT STRATEGIES
	A	**B**	**C**	**D**	**E[1]**	**F**	**G**	**Level of Risk**		
Dwellings bordering the reserve at 15a and 17 Montague Bay Road and 10a Loinah Road.	4	1	3	2	2	1	6	288 Moderate		Maintain a minimum 20 m wide outer zone along the reserve boundary adjoining these properties with fine fuel loads less than 5 tonnes per hectare. See MP 6 in the Best Management Practice Guidelines. Advise residents of the need to maintain an adequate defendable space around their dwellings.
Dwellings bordering the reserve at 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75 and 77 Leura Street.	4	1	3	2	2	1	6	288 Moderate		Maintain a minimum 15 m wide outer zone along the reserve boundary adjoining these properties with fine fuel loads less than 5 tonnes per hectare. See MP 6 in the Best Management Practice Guidelines. Advise residents of the need to maintain an adequate defendable space around their dwellings.
Dwellings bordering the reserve along the western side of Haven Court	4	1	3	2	2	1	6	288 Moderate		Maintain a minimum 15 m wide outer zone along the reserve boundary adjoining these properties with fine fuel loads less than 5 tonnes per hectare. See MP 6 in the Best Management Practice Guidelines. Advise residents of the need to maintain an adequate defendable space around their dwellings.
Dwellings bordering the reserve at 29 and 32 Leura Street, 29, 31, 33, and 35 Bastick Street and 20 and 21 Haven Court.	3	1	3	2	2	1	6	216 Low		Maintain adjacent VMU 9 as outer zone with fine fuel loads less than 5 tonnes per hectare. Advise residents of the need to maintain an adequate defendable space around their dwellings.

ASSET AT RISK	RISK ANALYSIS (See section 5.4 of the Bushfire Management Strategy)								OTHER BUSHFIRE RISKS	PROPOSED MANAGEMENT STRATEGIES
	A	**B**	**C**	**D**	**E[1]**	**F**	**G**	**Level of Risk**		
Dwellings bordering the reserve at 10, 12, 14, 16 and 18 Kellatie Road.	4	2	1	2	2	1	6	192 Low		Maintain a minimum 10 m wide outer zone along the reserve boundary adjoining these properties with fine fuel loads less than 5 tonnes per hectare. See MP 6 in the Best Management Practice Guidelines. Advise residents of the need to maintain an adequate defendable space around their dwellings.
Dwellings bordering the reserve at 20 and 26 Kellatie Road.	4	2	1	2	2	1	6	192 Low		Maintain a minimum 20 m wide outer zone along the reserve boundary adjoining the eastern side of 20 and the northern side of 26 Kellatie Road with fine fuel loads less than 5 tonnes per hectare. See MP 6 in the Best Management Practice Guidelines. Advise residents of the need to maintain an adequate defendable space around their dwellings.
Dwellings bordering the reserve at 12, 14, 16, 18, 20, 22, 24, 26, 28, 30 and 32 Loinah Road.	4	1	1	2	2	1	6	96 Low		Maintain a minimum 5 m wide outer zone along the reserve boundary adjoining these properties with fine fuel loads less than 5 tonnes per hectare. See MP 6 in the Best Management Practice Guidelines. Advise residents of the need to maintain an adequate defendable space around their dwellings.
Dwellings bordering the reserve at 8, 10, 12, 14, 16, 18 and 20 Akuna Street.	4	1	3	2	0.2	1	6	28 Low		Maintain a minimum 10 m wide outer zone along the reserve boundary with fine fuel loads less than 5 tonnes per hectare. See MP 6 in the Best Management Practice Guidelines. Advise residents of the need to maintain an adequate defendable space around their dwellings.

ASSET AT RISK	RISK ANALYSIS (See section 5.4 of the Bushfire Management Strategy)								OTHER BUSHFIRE RISKS	PROPOSED MANAGEMENT STRATEGIES
	A	**B**	**C**	**D**	**E[1]**	**F**	**G**	**Level of Risk**		
Dwellings bordering the reserve at 19, 21, 23, 25, 27, 29, 31 and 33 Montague Bay Road.	4	1	3	2	0.2	1	6	28 Low		Maintain a minimum 10 m wide outer zone along the reserve boundary with fine fuel loads less than 5 tonnes per hectare. See MP 6 in the Best Management Practice Guidelines. Advise residents of the need to maintain an adequate defendable space around their dwellings.

1 – Note that the risk analysis score in column E only indicates that there is enough space to provide a defendable space between bushland in the reserve and an adjoining asset. It does not indicate that a defendable space has been established on the adjoining property, or if established is being adequately managed.

3. Bushfire Management Issues

3.1 Existing Bushfire Management

3.1.1 Implementation of the Previous Bushfire Management Plan

As part of this revision of the BMP, a review of the success of the implementation of the previous plan was carried out. The review found that of 19 recommendations; 10 have been fully implemented, 7 have been partly implemented, and 2 have not been implemented. The 2 recommendations that were not implemented were signposting of fire trails at entry points and intersections so they can be identified day and night, and conduct a familiarisation tour of the reserve for local TFS brigades prior to the start of the fire permit period each year.

Recommendation 1) "Develop a community education program" has been partially implemented, the ongoing implementation of this is a high importance to provide best holistic management of the reserve.

The full findings of the review are in Appendix A.

3.1.2 Planned Burning

During the previous BMP 3 planned burns were prescribed in VMU's 2, 3 and 8. All burns were carried out successfully. In addition 0.1^{ha} was burnt in VMU 5 directly below the carpark in 2015 to remove residue created from vegetation thinning by a drum mulcher.

An amended burning schedule for the next 5 years has been included in this plan (see table 9).

3.1.3 Vehicle Access Routes and Foot Tracks

The location of the trails within the reserve considered necessary for bushfire management are shown in figure 6 and described in Table 8. Each fire trail has been assigned a usage class and its current condition assessed against the standard for their assigned usage class in MP 1 in the *Clarence City Council Bushfire Management Strategy – Best Management Practice Guidelines*.

The reserve has a perimeter fire trail that in sections is shared as a walking track with lockable bollards at both entry points. This was partially sealed in 2014 as part of the Tracks and Trails Strategy and is narrow in some sections. There is a fire trail from the summit of the hill that runs down the northern side of the hill to connect with the perimeter fire trail. This fire trail also had a partial foot track sealed in 2014. Entry from the summit is through a locked slip rail.

It is also possible to access the reserve through an unfenced vacant lot at the end of Haven Court.

To provide adequate access to the reserve for bushfire management it is recommended that RH2 be upgraded to class 3 standards.

No fire trails within the reserve have been identified as strategic under the Hobart Fire Protection Plan.

Figure 6 – Vehicle and Foot Access

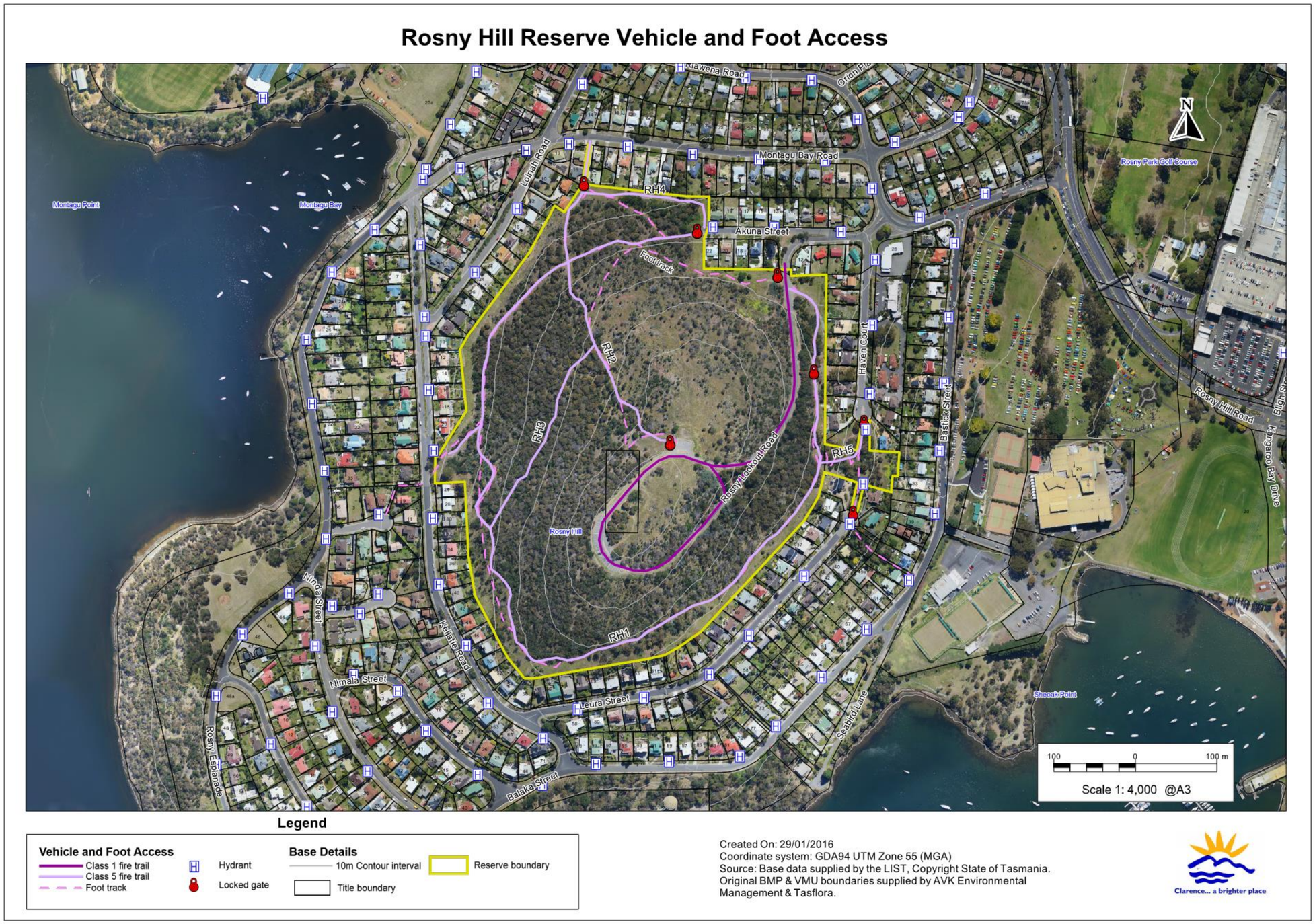


Table 8- Condition and maintenance of fire trails

Assigned usage class (see Management Procedure 1):	Maintenance priority:
Class 1 – all 2WD and 4WD vehicles **Class 3 –** all weather 4WD, light and heavy 4WD vehicles (category 3, 4 & 5 tankers) **Class 5 –** dry weather and/or high clearance 4WD, light 4WD (category 5 tankers), also includes trails with sharp bends and dead end trails with small turning areas.	**High** priority - major through routes and fire control lines **Medium** priority - important access and escape routes and minor fire control lines **Low** priority - minor access routes and boundaries of vegetation management units.

The trail usage class describes the suitability of the fire trail if properly maintained, not necessarily its condition at the time of inspection.

MP refers to Management Procedures in *Clarence City Council Bushfire Management Strategy – Best Management Practice Guidelines

FIRE TRAIL ID	USAGE CLASS	STRATEGIC FIRE TRAIL UNDER HOBART FIRE PROTECTION PLAN[1]	MAINTENANCE PRIORITY	LOCATION AND CONDITION AT JANUARY 2016	ACTION REQUIRED	MANAGEMENT CONSTRAINT
RH1	5	NO	High	Runs from the end of Akuna Street around the perimeter of the reserve to the main reserve entrance at Rosny Lookout Road. RH1 can also be accessed from the end of Haven Court across a vacant lot. Gravel sealed sections of trail are narrow. Unsealed sections can be slippery in wet weather. Limited passing bays.	Monitoring and maintenance as per MP2.	Sections of fire trail are multi user trail. Consult with CCC Tracks Planner prior to works as required.

FIRE TRAIL ID	USAGE CLASS	STRATEGIC FIRE TRAIL UNDER HOBART FIRE PROTECTION PLAN[1]	MAINTENANCE PRIORITY	LOCATION AND CONDITION AT JANUARY 2016	ACTION REQUIRED	MANAGEMENT CONSTRAINT
RH2	5	NO	Medium	Runs from the summit car park down the northern side of the hill to Montague Bay Road. Trail is unformed with partial formed walking track with high ridge. Trail may be slippery in wet weather. Fire trail meets usage class 5 standards.	Cut back encroaching vegetation to MP1 standards. Clear vegetation and install larger culvert on corner behind 10A Loinah Road.	Sections of fire trail are multi user trail. Consult with CCC Tracks Planner prior to works as required.
RH3	5	NO	Medium	Runs from RH2 south to RH1 dissecting VMU 4 and 5. Fire trail is unformed and maybe slippery in wet weather.	Cut back encroaching vegetation to MP1 standards. Install passing bay to MP1 standards.	Fire trail has threatened plant species *Lepidium pseudotasmanicum*[4] and *Rytidosperma indutum*[4], adjacent in areas. Obtain a permit from DPIPWE Threatened Species Section before disturbance.
RH4	5	NO	Medium	Runs from the Akuna Road entrance to RH2 around the northern perimeter of the reserve. Most of the fire trail is unformed and follows the perimeter outer zone. Trail meets usage class 5 standards.	Formed trail not required as long as vehicles can drive through the outer zone. Cut back encroaching vegetation to MP1 standards.	No management restraints.

FIRE TRAIL ID	USAGE CLASS	STRATEGIC FIRE TRAIL UNDER HOBART FIRE PROTECTION PLAN[1]	MAINTENANCE PRIORITY	LOCATION AND CONDITION AT JANUARY 2016	ACTION REQUIRED	MANAGEMENT CONSTRAINT
RH5	5	NO	Low	Short link trail from RH1 to Haven Court. Trail currently runs through a vacant lot on private property. As this is a valuable link it should be rerouted through the reserve.	Reroute the trail to provide usage class 5 access from RH1 to Haven Court.	No management restraints.

[1] Strategic fire trails have been identified in the Hobart Fire Protection Plan. Strategic fire trails will be signposted.

[2] Tasmanian *Threatened Species Protection Act* 1995

3.1.4 Water Supply

There are no water sources within the reserve. However, water for firefighting and bushfire management can be easily obtained from fire hydrants in the streets surrounding the reserve (figure 5).

3.1.5 Fuel Breaks and Defendable Spaces

A fuel break (sometimes called a "firebreak") is a strip of cleared, or partly cleared, bushland constructed and maintained to slow, or stop, the progress of a bushfire to assist in its control. They are not the same as defendable spaces which are maintained around vulnerable assets to protect them from bushfires. Fuel breaks in grassland can be effective in stopping fires if cleared down to mineral earth, but where trees and shrubs are present wind-blown burning embers will usually carry a bushfire across a fuel break. Therefore, in bushland with shrubs and trees the only benefit of a fuel break is to provide access for firefighters and a boundary for back burning operations. Currently there are no standards or guidelines for fuel breaks in Tasmania. There is no fuel breaks maintained in the reserve, nor are any considered necessary.

A defendable space is an area of managed vegetation around an asset likely to be at risk from bushfire that protects it from direct flame contact and intense radiant heat, as well providing an area where fire fighters can defend the asset. The Tasmania Fire Service document *Bushfire Survival Plan 2015-2016* recommends that a defendable space includes two 'zones':

- An inner zone (formerly Bushfire Protection Zone) where flammable materials are minimised.
- An outer zone (formerly Fuel Modified Buffer Zone) where a low level of flammable material is permitted.

In the inner zone, flammable materials on, under and around your home should be moved away from the house.

In the inner zone:

- Include non-flammable areas such as paths, driveways, and mowed lawns.
- Use non-flammable mulch; do not use woodchips or bark.
- Locate any dams, orchards, vegetable gardens and any effluent disposal areas on the fire-prone side of the home.
- Use radiation shields and windbreaks such as stone or metal fences and hedges using low-flammability plants.
- Remove fire hazards such as wood piles, rubbish heaps and stored fuels.
- Replace all highly-flammable plants with low-flammability plants.
- Prune lower branches on trees and remove flammable shrubs from under and between trees.
- Rake up bark and leaves and keep roofs and gutters clear of flammable debris.

The TFS notes that it is not necessary to remove all vegetation from the inner zone. Individual trees rarely cause houses to burn in bushfires.

Trees can screen a building from windblown embers while protecting it from radiant heat. Smooth barked trees are less likely to catch fire than those with rough bark. No tree should be able to fall on the building.

In the outer zone, small-sized natural fuels (such as leaf litter, bark, sticks, tussocks and some shrubs) should be removed and larger fuels (trees and shrubs) should be cut back to reduce the intensity of an approaching bushfire.

Natural fuels, both on the ground and between the ground and any larger trees, should be reduced by selective removal of vegetation, both horizontally and vertically, followed by ongoing maintenance.

In the outer zone:

- Retain established trees to trap embers and reduce wind speeds.
- Selectively remove small trees and shrubs to create clumps (rather than a continuous wall of trees) separated by open areas.
- Remove the vegetation between the ground and the bottom of the tree canopy, to a height of at least two metres.
- Minimise fine fuels at ground level, such as grasses and leaf litter.

Currently there is an 8m to 30m wide outer zone maintained along the reserve perimeter boundary with adjoining residential developments (VMU 1 and VMU 9). This is maintained annually by Councils Fire and Bushland Management Team, and are adequate to meet TFS requirements for an outer zone. These outer zones are also considered adequate to supplement the defendable space maintained by adjoining residents. The outer zone behind properties in Kellatie Road requires periodic planned burning to reduce fuel loads to $<5^{t/ha}$. The outer zone is drivable in sections, however caution needs to be given as some sections are steep and can be slippery in summer following the slashing of cured grasses.

The existence and adequacy of defendable spaces on individual lots adjoining the reserve was not surveyed as part of this BMP. Nevertheless, it must be stressed that establishment and maintenance of defendable spaces around residences bordering the reserve is essential for bushfire protection. Clarence City Council and individual landowners need to co-operate to provide and maintain adequate bushfire protection.

3.1.6 Bushfire Detection and Suppression

Rosny Hill Reserve is highly visible from surrounding suburbs and it is likely that any fires would be promptly reported. The perimeter fire trail and internal access should be sufficient to allow the TFS to rapidly reach and contain fires within the reserve. The location of the reserve on a circular hill means that fires in the reserve will tend to burn upslope to the top of the hill, unless there are very strong winds. Fires approaching residential areas will generally be moving downslope which will reduce their intensity. In this situation the perimeter fire trail and outer zone could be an effective control line.

3.2 Weeds

The long perimeter with surrounding urban areas and frequent vehicle traffic through the reserve makes it vulnerable to weed invasion with the main weed infested areas around the perimeter and along the sealed road.

A comprehensive weed survey was not carried out as part of this plan however localised infestations of gorse, cotoneaster and Montpellier broom were noticed on the lower slopes of the reserve and boneseed is scattered throughout the reserve. Other weeds noticed in the reserve include; blackberry, wandering creeper, fennel, periwinkle and tree lucerne. The summit area within the loop road is dominated by introduced grasses. Weed locations observed during fieldwork for this plan are shown on figure 7.

Pre and post burn weed management has occurred within the reserve for the duration of the previous BMP and will continue as outlined in MP8 *Clarence City Council Bushfire Management Strategy – Best Management Practice Guidelines.*

Although sheoak (*Allocasuarina verticillata*) is an indigenous species it is capable of dominating suitable sites and forming monocultures that severely reduce understory species diversity as well as killing canopy species and preventing their regeneration. The resulting dense thickets are also a bushfire hazard. Since 2011 VMU 4, 5 and 8 has had extensive sheoak density reduction targeted in areas with suppressed eucalypt regeneration. Four years post the introduction of this regime, previously suppressed eucalypts with density reductions now have early stages of healthy crowns, post thinning epicormic growth is developing into limbs and although sparse eucalypt regeneration is occurring in the gap disturbances caused by heap burning.

This regime is particularly important for retaining the remaining areas of open grassland

3.3 Stakeholder and Community Concerns

At the commencement of the project Clarence City Council sent a letter to all landowners adjoining the reserve and to other stakeholder groups informing them that the bushfire management strategy was being revised and inviting them to have input into the plan for the reserve by sending in a written submission, attending a community "walk and talk" at the reserve, or by contacting the reviewer directly. The community "walk and talk" was held in the reserve on the 14th November 2015 and was attended by 10 community members (including members of the Rosny Montague Bay Landcare and Coastcare Group) and a Council representative. Two written comments were received. The community concerns about bushfire management in the reserve expressed during the walk and talk are summarised in Appendix B along with the Council's response. The main topics discussed were:

- outer zone management – what are they and how does Council determine distances
- frequency of burning regimes and the impact to vegetation communities
- minimal communication between Landcare Group and Council Fire and Bushland Management
- alignment of track network
- unburnt heaps within reserve
- habitat for fauna within reserve
- water availability to TFS
- Future use of the reserve.

4. Plan Implementation

To ensure that the recommendations in this plan are fully implemented, Clarence City Council will ensure that TFS brigades likely to attend bushfires within the reserve are familiar with the plan, and its contents are registered on the TFS communication system.

4.1 Bushfire Risk Reduction Strategy

The overall bushfire risk reduction strategy recommended for the Rosny Hill Reserve can be summarised as follows:

- Reduce ignitions through prosecution of arsonists; prompt reporting of fires and control of access to the reserve at night.
- Maintain access points and fire trails to enable the TFS to rapidly contain fires that start in the reserve and ensure the TFS are familiar with the location and condition of fire trails in the reserve.
- Maintain defendable spaces in the reserve to protect assets adjoining the reserve
- Carry out strategic planned burning to reduce bushfire hazards in the reserve.
- Encourage neighbouring residents to maintain defendable spaces around their homes.

4.2 Community Education, Awareness and Involvement

To ensure successful implementation of this BMP it will be necessary to inform key sectors of the community about bushfire management issues in the reserve. This should include surrounding residents and those with special interests in the reserve, or whose activities can affect assets within the reserve. The community education process is detailed in section 5.7 of *Clarence City Council Bushfire Management Strategy for Council Owned and Controlled Land*. This was only partially implemented in the previous BMP and is a pivotal point in the effectiveness of this BMP.

In particular, adjoining residents should be advised that dumping garden waste and other rubbish in reserves increases the bushfire hazard and makes firefighting along the bushland/urban interface more difficult and dangerous for fire fighters. It also contributes to the spread of weeds. Residents should also be advised that they are not authorised to remove vegetation in a Council reserve, even if it is recommended in the BMP. If residents have any concerns about the bushfire hazard in the reserve near their home, they should be encouraged to contact Council's Fire and Bushland Vegetation Management Co-ordinator.

4.3 Planned Burning

The native plant communities in the reserve are considered dependent on bushfire to maintain their structure and floristics in the long term. Periodic burning will help to maintain diversity in the understorey, and allow bushfire dependent species to germinate and establish. However, there is a need to minimise damage to important habitat elements (such as dead trees, old logs and stumps) during these burns, and to ensure adequate retention of unburnt patches of each forest type to act as refugia for recolonisation of burnt areas.

4.3.1 Vegetation Management Units (VMU)

The planned burning program in this plan is based on the division of the shrubland, woodland and grassland habitats into a mosaic of vegetation management units (VMUs) (see figure 7). VMUs can be burnt at a frequency, season and intensity that are optimal for the plant communities within each unit or excluded from bushfire if the vegetation does not require burning or the VMU is being managed by other means. The bushfire management requirements of the vegetation communities within the reserve are given in table 6.

The reserve has been divided into 9 VMUs based on the vegetation types in the reserve, and the presence of suitable control lines in the form of fire trails and foot tracks. These VMUs allow for implementation of the most appropriate methods for managing bushfire hazard whilst promoting biodiversity.

4.3.2 Planned Fire Regimes

The approach adopted in this plan is to use planned burning for a combination of asset protection and for habitat management.

Planned burning operations should be carried out following the seed-setting period of native species and after the nesting period of the understorey bird species in the reserve. Where possible hollow logs and dead trees should be protected from bushfire due to their fauna habitat value. This can be achieved by using wet lines around the tree or log, or raking fine fuels away from logs or the base of hollow trees, and rapidly extinguishing fires at these points should they occur.

This BMP covers a 5-year period, after which another review is recommended. Burns within the reserve have been scheduled in table 9. To allow for flexibility in budgeting and planning, and for unfavourable weather, the burns can take place in the year following that recommended in table 9, if required. If a bushfire burns more than half of a VMU, the whole of the VMU should be considered to have been burnt and the schedule adjusted accordingly. In order to create a mosaic of native bushland with different bushfire histories, VMUs should generally not be burnt within 2 years of adjoining VMUs.

Figure 7 – Vegetation Management Units in the Reserve

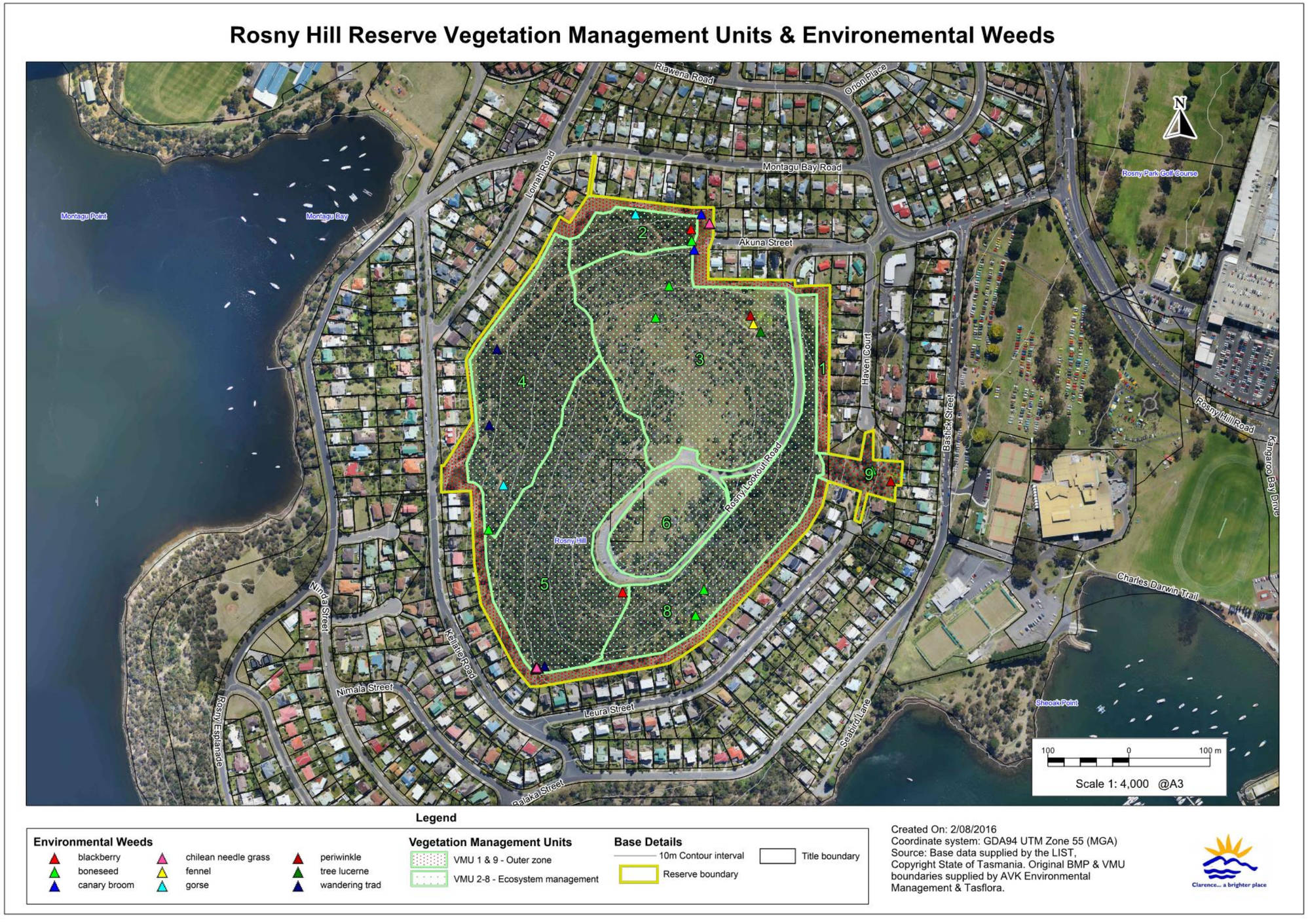


Table 9– Bushfire management in the reserve

VMU[1]	AREA (ha)	BUSHFIRE MANAGEMENT OBJECTIVES and PRESCRIPTIONS	NOTES and PRECAUTIONS [2, 3]	LAST BURNT	NEXT BURN
1 NAV NBA DVG	2.56	OBJECTIVES: Maintain as an outer zone to protect adjoining dwellings. Reduce the extent and density of weeds. PRESCRIPTION: See table 7 for widths and MP 5 in the Best Management Practices Guidelines for outer zone specifications.	Pile burns only if required.	1997	Patch or pile burn as required to keep fuel loads <5t/ha
2 NBA NAV	0.76	OBJECTIVES: Maintain as grassy woodland and shrubland. Promote regeneration of canopy species and limit density of sheoaks to 60 % total canopy cover. Maintain visual amenity. Reduce the extent and density of weeds. PRESCRIPTION: Autumn or Spring burn every 15 to 20 years.	Protect adjoining property during burns.	2015	Assess next plan
3 NAV GTL GCL	5.27	OBJECTIVES: Maintain as grassy woodland and grassland. Promote regeneration of canopy species and limit density of sheoaks to 40 % total canopy cover. Maintain visual amenity. Reduce the extent and density of weeds. PRESCRIPTION: Autumn or Spring burn every 3 to 8 years.	Contains the threatened plant species *Austrostipa nodosa*[3], *Dianella amoena*[2,3] and *Rytidosperma indutum*[4]. Obtain a permit from DPIPWE Threatened Species Section before burning. Protect adjoining property during burns.	2012	2019

VMU[1]	AREA (ha)	BUSHFIRE MANAGEMENT OBJECTIVES and PRESCRIPTIONS	NOTES and PRECAUTIONS [2, 3]	LAST BURNT	NEXT BURN
4 NAV	3.12	OBJECTIVES: Maintain as grassy woodland and shrubland. Promote regeneration of canopy species and limit density of sheoaks to 60 % total canopy cover. Maintain visual amenity. Reduce the extent and density of weeds. PRESCRIPTION: Manually thin sheoak when minimum density is exceeded	Contains the threatened plant species *Rytidosperma indutum*[4]and *Lepidium pseudotasmanicum*[3]. Obtain a permit from DPIPWE Threatened Species Section before burning. Protect adjoining property during burns.	Periodically pile burnt throughout previous BMP	Pile burns only
5 NAV	4.35	OBJECTIVES: Maintain as grassy woodland and shrubland. Promote regeneration of canopy species and limit density of sheoaks to 60 % total canopy cover. Maintain visual amenity. Reduce the extent and density of weeds. PRESCRIPTION: Manually thin sheoak when minimum density is exceeded	Contains the threatened plant species *Lepidium pseudotasmanicum*[3], *Rytidosperma indutum*[3], *Thelymitra bracteata*[3] and *Vittadinia muelleri*[3]. Obtain a permit from DPIPWE Threatened Species Section before burning. Pile burns only if required. Retain landscape buffer below lookout car park. **Vegetation Monitoring:** Permanent Inventory Plot PIP002 to be measured pre and post burn.	0.1ha planned burn below carpark 2015. Periodically pile burnt throughout previous BMP.	Pile burns only
6 NBA DVG	1.29	OBJECTIVES: Maintain as suitable habitat for the threatened plant species *Thelymitra bracteata*[3]. Reduce the extent and density of weeds. PRESCRIPTION: Consult with DPIPWE Threatened Species Section regarding optimal management regime.	Contains the threatened plant species *Thelymitra bracteata*[3]. Obtain a permit from DPIPWE Threatened Species Section before burning or slashing. No slashing or burning between July and December.	2016	As advised by DPIPWE
7 DVG	0.07	OBJECTIVES: Protect ornamental plantings. Maintain groundcover to minimise erosion. Reduce the extent and density of weeds. PRESCRIPTION: No burning for the duration of this plan		Not known	No burning

VMU[1]	AREA (ha)	BUSHFIRE MANAGEMENT OBJECTIVES and PRESCRIPTIONS	NOTES and PRECAUTIONS [2, 3]	LAST BURNT	NEXT BURN
8 NBA DVG	2.78	OBJECTIVES: Maintain as grassy woodland and shrubland. Allow recruitment of canopy species. Maintain groundcover to minimise erosion. Reduce the extent and density of weeds. PRESCRIPTION: Autumn or spring burn every 12 years	Protect adjoining property during burns.	2015	Assess next plan
9 DVG	0.46	OBJECTIVES: Maintain as an outer zone to protect adjoining dwellings. Reduce the extent and density of weeds. Maintain groundcover to minimise erosion. PRESCRIPTION: See MP 5 in the Best Management Practices Guidelines for outer zone specifications.	Protect adjoining property during burns.	Patch burnt 2016	Patch or pile burn as required to keep fuel loads <5t/ha

[1] TASVEG 3.0 codes of vegetation types in the unit.

[2] *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

[3] Tasmanian *Threatened Species Protection Act* 1995

4.3.3 Preparation and Supervision

The VMUs scheduled for burning should be inspected some months before the proposed burn to check that the scheduling and burning prescriptions are still appropriate and to determine whether weeds are present that require treatment before burning. Where treatment of weeds is required, it should be carried out at least 3 months in advance of the burn to allow treated weeds to desiccate. Disturbance of the treated infestations (by mechanical means, slashing or burning) within this period may reduce the herbicide's effectiveness, and regeneration from rootstock is likely to occur.

Successful implementation of the planned burns in this plan requires trained personnel and special equipment. Each planned burn recommended in this plan must have a burn plan prepared by someone who has completed the Forestry Tasmania "Develop Prescribed Burning Plans" course or equivalent. All persons engaged in planned burning or firefighting in the reserve must have completed the Forestry Tasmania "Forest Fire Fighting" course or equivalent.

If the planned burning is contracted out, the contractor must be able to meet the required training accreditation in the previous paragraph, as well as provide evidence of experience in carrying out broadscale low intensity fuel reduction burns.

4.4 Bushland Management

Bushfire can provide the disturbance that many introduced species need to spread to new areas, as well as to expand existing populations. Other bushfire management activities, such as construction and maintenance of fire trails, and bulldozing of fuel breaks during bushfire suppression, can also provide opportunities for weeds to colonise native bushland. Fire can also be used as a tool to manage weed infestations. Some species are best controlled by herbicide application to regrowth following a bushfire.

Other species can sometimes be controlled by the application of a fire regime that stimulates germination of seed but kills the regrowth before it has been able to flower.

The planned burning recommended in this plan can assist a weed control program, and it is recommended that weed control activities be integrated with the management burning program in this plan. MP 8 in *Clarence City Council Bushfire Management Strategy - Best Management Practice Guidelines* includes guidelines for integrating weed management with planned burning, and for minimising the risk of weed invasion following bushfires. These guidelines should ensure that fires in the reserve do not worsen existing weed problems, or cause weeds to spread.

It should be noted that bush regeneration plantings in previously cleared areas might increase the bushfire hazard. Any proposals for bush regeneration in the reserve should be considered in the context of this bushfire management plan to ensure that they do not compromise bushfire protection measures proposed in this plan.

In general, plantings should not be allowed:

- on inner zones and outer zones established around assets at risk
- on fuel breaks
- Within 2 m of the edge of fire trails.

4.4.1 Control of Sheoak (*Allocasuarina verticillata*)

Dense thickets of sheoak increase the bushfire hazard and reduce biodiversity by inhibiting understorey species. Dense thickets of sheoak also put additional stress on eucalypts growing in the thickets, particularly during drought, which can lead to dieback and death. This is evident over most of the western side of the reserve. Experience in other reserves has shown that planned burning alone is not sufficient to control sheoak and manual thinning is likely to be the most cost-effective and successful method. For the VMUs that have had a maximum sheoak density prescribed in table 9, manual removal should be undertaken as required to meet the cover limit. The suggested procedure is as follows:

- Assess total cover of sheoak in the VMU from aerial photos and determine the approximate number that have to be removed.
- Where eucalypts are still present, remove sheoaks within 5 m of the base of the trees. If this is not sufficient to meet the total cover target, remove further sheoak at random, preferably older senescent shrubs.

- Remove sheoak by cutting the stem and pasting the exposed stump with herbicide.
- If the VMU is scheduled for burning this should be carried out at least 3 months before a scheduled burn. The cut upper part of the stem should be left on the ground as fuel for the subsequent fire.
- If a VMU is not scheduled for burning, cut sheoak should either be mulched and used for landscaping, or piled and burnt on site.

5. Bushfire Management Recommendations

The management actions recommended to meet the objectives of the plan in section 1.3 have been summarised and classified using the following criteria:

URGENT - Actions required to reduce a very high risk to life or property.

ESSENTIAL - Actions required to improve safety, or inadequate bushfire protection measures in high risk areas.

- Actions that are essential for control & suppression of bushfires, and/or conservation of threatened species.

RECOMMENDED - Actions required to improve inadequate bushfire protection measures in moderate risk areas.

- Actions required to ensure on-going effective bushfire management, or conservation of biodiversity.

ROUTINE - Maintenance of bushfire control resources and protection measures.

Urgent actions need to be undertaken as soon as possible.

Where applicable the desirable timing of other actions has been coded as follows:

A - Inspect and maintain annually, or as specified in the relevant MP

A/S - Timing as specified in the bushfire management plan

1, 2, etc - Carry out action within the time period specified (years)

1A, 2A etc - Construct within the next 1, 2 etc years and then inspect and maintain annually, or as specified in the relevant MP.

Management actions have been linked to generic MP's in *Clarence City Council Bushfire Management Strategy – Best Management Practice Guidelines*. Performance indicators have also been provided for each management action. These should be used to determine if the specific objectives of this bushfire management plan have been achieved. They should be monitored when the plan is revised every 5 years. Where performance targets are not being achieved, a review of the relevant portion of the plan should be undertaken

5.1 Management Action Summary

MP refers to Management Procedures in *Clarence City Council Bushfire Management Strategy – Best Management Practice Guidelines

RECOMMENDED ACTION	OBJECTIVE (section 1.3)	PRIORITY	RESPONSIBILITY	PERFORMANCE INDICATORS
1) Develop/implement a community education program, including an information sheet as outlined in section 5.7 of the Bushfire Management Strategy, to inform the community of bushfire management issues in the reserve and to ask them to report any smoke, or suspicious activity, on days of total fire bans to the police.	1, 2	REC - 1	Clarence City Council Fire and Bushland Management Tasmania Fire Service	Educational material distributed to adjoining residents, reserve users and other interest groups. Reduction in the incidence of illegal fires on and around the reserve.
2) Implement the bushfire protection measures in section 2.4 for protection of built assets in and around the reserve. In particular maintenance of outer zone behind Kellatie Road.	1, 4	E	Clarence City Council Fire and Bushland Management Private landowners	Bushfire protection measures in the reserve implemented and maintained. No assets lost to fires originating in, or moving through, the reserve.
3) Erect appropriate signs on tracks and roads to warn reserve users of planned burns.	1	E	Clarence City Council Fire and Bushland Management	No users of the reserve injured by planned burns.
4) Implement the recovery procedures in MP 12 following planned burns and bushfires.	1, 5, 6	E	Clarence City Council Fire and Bushland Management	Post-fire recovery carried out after planned burns and bushfires. No users of the reserve injured by fires or the effects of fires.
5) Carry out fire trail repairs and maintenance listed in table 8. In particular upgrade foot track between VMU 4&5 to C5 fire trail standards.	2, 6	E – 2	Clarence City Council Fire and Bushland Management	Fire trail repair and upgrade works listed in table 8 completed.

RECOMMENDED ACTION	OBJECTIVE (section 1.3)	PRIORITY	RESPONSIBILITY	PERFORMANCE INDICATORS
6) Ensure fire trails shown on Figure 6 are inspected and, where specified in table 8, are maintained in a trafficable condition at all times according to table 8 and MP 2.	2, 4	ROU - A	Clarence City Council	Vehicle access routes inspected as required in MP 2, and maintained in a trafficable condition for fire service vehicles.
7) Signpost fire trails at entry points and intersections so they can be identified day and night.	2	REC - A	Clarence City Council Fire and Bushland Management	Signage installed and legible.
8) Inspect gates regularly to ensure that locks are in place and functioning. Ensure that the local TFS Brigade and other emergency services have keys to the gates on trails giving access to the reserve.	2	ROU - A	Clarence City Council Fire and Bushland Management	No unauthorised use of fire trails in the reserve. Security lock system implemented, keys distributed to TFS brigades and other emergency services.
9) Upon request conduct familiarisation tour of the reserve for local TFS brigades prior to the start of the fire permit period each year.	1, 2, 4	ROU	Clarence City Council Fire and Bushland Management Tasmania Fire Service	Local TFS brigades familiar with reserve.
10) Carry out planned burning according to the schedule in table 9 using the procedure in MP 7.	2, 3, 4, 5	E - A/S	Clarence City Council Fire and Bushland Management	Mosaic of burnt VMUs maintained. No decline in the populations or distribution of threatened species. Structure and floristics of native plant communities maintained.

RECOMMENDED ACTION	OBJECTIVE (section 1.3)	PRIORITY	RESPONSIBILITY	PERFORMANCE INDICATORS
11) Consult with the DPIPWE Threatened Species Section when carrying out bushfire management activities that may affect populations of threatened flora or fauna. In particular, develop a management and monitoring regime for the population of *Thelymitra bracteata.*	3	E	Clarence City Council Fire and Bushland Management DPIPWE Threatened Species Section	All planned burns carried out according to the requirements of threatened flora and fauna. All required permits obtained before burns or other management activities likely to affect threatened species. Management and monitoring regime for the population of *Thelymitra bracteata* developed in consultation with DPIPWE.
12) Avoid burning the whole of any population of a threatened or rare plant species in a single fire.	3	E	Clarence City Council Fire and Bushland Management Tasmania Fire Service	All planned burns carried out according to the requirements of threatened flora and fauna. No decline in the populations of threatened or rare flora and fauna due to fire.
13) Carry out vegetation monitoring as detailed in section 5.10 of the Bushfire Management Strategy including the recovery of any populations of threatened or rare flora and fauna burnt by bushfires or planned burns.	3, 5	E	Clarence City Council DPIPWE Threatened Species Section	Vegetation monitoring plots set up and surveyed and data on the population size and extent of threatened species recorded before planned burns. Regular follow-up surveys undertaken.
14) Regularly revise burning schedules and prescriptions to ensure they incorporate the most recent information on the fire ecology of flora, fauna and plant communities of conservation value in the reserve.	3, 5	REC - A/S	Clarence City Council Fire and Bushland Management	Bushfire management plan revised every 5 years.

RECOMMENDED ACTION	OBJECTIVE (section 1.3)	PRIORITY	RESPONSIBILITY	PERFORMANCE INDICATORS
15) Treat any weeds in areas to be burnt under this bushfire management plan according to MP 8. Ensure follow-up weeding is carried out after planned burns and bushfires.	3, 5	REC – A/S	Clarence City Council Landcare Groups	Pre- and post-fire weed control carried out in any weed infested VMUs burnt under this plan. Minimal coppicing or regrowth of weeds from treated rootstock. All declared noxious weeds removed, reduction in extent of other weeds.
16) Thin out sheoak in VMUs where the total cover exceeds the limit set in table 9 using the procedure in section 4.4.1.	3, 5	REC – A/S	Clarence City Council Fire and Bushland Management Landcare Groups	Density of sheoak maintained within management limits.
17) Coordinate bushfire management, weed management and other management activities using the procedure in MP 9.	3, 5	REC - A	Clarence City Council Landcare Groups	Meetings held as recommended in MP9 and the outcomes recorded.
18) Ensure all personnel engaged in planned burning activities in the reserve have the appropriate level of training and equipment as outlined in the bushfire management strategy, and the minimum equipment listed in MP 7.	1, 2	E	Clarence City Council Fire and Bushland Management	All personnel are able to demonstrate the required level of training and minimum levels of equipment.
19) Record bushfire management activities and bushfires using the procedures in MPs 10 and 11.	3, 4, 5	REC - A/S	Clarence City Council Fire and Bushland Management	Records maintained of all bushfire management activities.

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Appendix A

Implementation of the previous bushfire management plan

The following codes have been used in assessing implementation of the previous Bushfire Management Plan for Rosny Hill Reserve:

IS – Implemented successfully

PI – Partly implemented

NI – Not implemented

NA – Not applicable (to be implemented at a later time, or dependent on another incident or action).

RECOMMENDED ACTION	CODE	COMMENT
1) Develop a community education program, including an information sheet as outlined in section 5.7 of the Bushfire Management Strategy, to inform the community of bushfire management issues in the reserve and to ask them to report any smoke, or suspicious activity, on days of total fire bans to the police.	PI	A formalised community education program has not been designed. Public exhibition of Councils *Bushfire Management Strategy for Council Owned and Controlled Land*, *Bushfire Management Strategy Best Management Practice Guidelines* and the previous BMP for the park has taken place. Various TFS community bushfire preparation events have been attended and represented by Council Fire and Bushland Management throughout municipality.
2) Implement the bushfire protection measures in section 2.4 for protection of built assets in and around the reserve.	PI	Some sections of outer zones need maintenance to meet current TFS standards.
3) Erect appropriate signs on tracks and roads to warn reserve users of planned burns.	IS	At times community has become complacent with planned burn hazard signs and entered burn area during burning operations. Recommend this be included in community education program.
4) Implement the recovery procedures in MP 12 following planned burns and bushfires.	IS	All procedures implemented successfully. VMU 5 had a permanent vegetation monitoring plot established in October 2013 that is measured annually.
5) Carry out fire trail repairs and maintenance listed in table 9.	PI	Walking tracks have been establishment on sections of fire trail network detracting effectiveness in sections. Recommend ongoing communication between Council Tracks Planner and Council Fire and Bushland Management. Recommend remedial work to bring up to MP 1 usage categories.

RECOMMENDED ACTION	CODE	COMMENT
6) Ensure fire trails shown on Figure 5 are inspected and, where specified in table 9, are maintained in a trafficable condition at all times according to table 9 and MP 2.	PI	Walking tracks have been establishment on sections of fire trail network detracting effectiveness in sections. Recommend ongoing communication between Council tracks planner and Council Fire and Bushland Management. Recommend remedial work to bring up to MP 1 usage categories.
7) Signpost fire trails at entry points and intersections so they can be identified day and night.	NI	Fire trails not sign posted. Recommend sign posting of RH2 at junction RH1/RH2 and entrance to RH2 from ring road car park.
8) Inspect gates regularly to ensure that locks are in place and functioning. Ensure that the local Tasmania Fire Service Brigade and other emergency services have keys to the gates on trails giving access to the reserve.	IS	Gates inspected regularly. Both chain link barriers on RH1 entrances have been replaced with lockable fold down bollards in 2014. Entrance to RH2 from ring road car park had slip rail installed 2015.
9) Conduct a familiarisation tour of the reserve for local TFS brigades prior to the start of the fire permit period each year.	NI	Tour of reserve not provided. Will be provided upon request from TFS.
10) Carry out planned burning according to the schedule in table 10 using the procedure in MP 7.	IS	All scheduled planned burns carried out successfully.
11) Consult with the DPIPWE Threatened Species Section when carrying out bushfire management activities that may affect populations of threatened flora or fauna. In particular, develop a management and monitoring regime for the population of *Thelymitra bracteata.*	PI	DPIPWE consulted as required for operations within reserve. No management and monitoring regime developed for *Thelymitra bracteata.*
12) Avoid burning the whole of any population of a threatened or rare plant species in a single fire.	IS	Mosaic lighting techniques used as required when threatened or rare plant species present.

RECOMMENDED ACTION	CODE	COMMENT
13) Carry out vegetation monitoring as detailed in section 5.10 of the Bushfire Management Strategy including the recovery of any populations of threatened or rare flora and fauna burnt by wildfires or planned burns.	PI	Permanent vegetation monitoring plot established in VMU 5 during 2013 and re-measured annually. Recommend additional monitoring plot established during 2016-2021 BMP.
14) Regularly revise burning schedules and prescriptions to ensure they incorporate the most recent information on the fire ecology of flora, fauna and plant communities of conservation value in the reserve.	IS	Most current methodologies, legislation and data factored in at review stage of BMP.
15) Treat any weeds in areas to be burnt under this bushfire management plan according to MP 8. Ensure follow-up weeding is carried out after planned burns and wildfires.	IS	Pre and post burn weed management is ongoing within reserve.
16) Thin out sheoak in VMUs where the total cover exceeds the limit set in table 10 using the procedure in section 4.4.1.	IS	Extensive sheoak thinning has occurred and will continue throughout life of BMP. Permanent vegetation monitoring plot established in VMU 5 during 2013 will continue to gather data of effectiveness of sheoak thinning prescription.
17) Coordinate bushfire management, weed management and other management activities using the procedure in MP 9.	PI	Some meetings have taken place between stakeholders. Landcare group has undertaken weed work leaving piles to be burnt without notifying Council Fire and Bushland Management resulting in piles unburnt (December 2015). Recommend communication strategy developed noting increased communication between Landcare groups and Council Fire and Bushland Management.
18) Ensure all personnel engaged in planned burning activities in the reserve have the appropriate level of training and equipment as outlined in the bushfire management strategy, and the minimum equipment listed in MP 7.	IS	Councils Fire and Bushland Crew has been fulltime since 2012. Crew Consists of three Workers, one Works Officer and one Coordinator. Since 2013 the crew has had extensive additional training to complement the existing high skillset. Additional training will be recommended to suit future crew development.

RECOMMENDED ACTION	CODE	COMMENT
19) Record bushfire management activities and wildfires using the procedures in MPs 10 and 11.	IS	Since 2012 an extensive Fire Management context has been developed within Councils Geographical Information System (GIS). This is an ongoing project that records bushfire management data. This data is shared with State Government agencies with regular updates.

Appendix B

Summary of community concerns and comments

in the initial round of community consultation

COMMUNITY CONCERNS and COMMENTS	COUNCIL'S COMMENT
Question on clearing of vegetation within outer zone and how it is managed by Council, in particular what is removed and distances.	Explained AS:3959-2009 and why council manages outer zone as they do. Explained annual vegetation slashing within reserve.
Comment on encroaching sheoaks into outer zone.	Explained this will be picked up in review process and all maintenance will be scheduled in revised Bushfire Management Plan
Concern over frequency of burning regimes and the impact to vegetation communities.	Explained methodology as how burning regimes are identified and implemented for each VMU based on individual VMU characteristics.
Comment that Landcare Group uses Reserve Activity Plans as planning tool and not in conjunction with reserves Bushfire Management Plan.	Commented relevance of Bushfire Management Plan and emphasised importance of Landcare Groups understanding of Bushfire Management Plan. Emphasised strengthening relationships between Landcare Groups and Councils Fire and Bushland Management.
Concern over alignment of new sections of walking track. In particular too many tracks, why was new alignment cut in and existing network not utilised?	Commented uncertain as why new alignment took place in sections. Commented need for better communication internally for maintenance/establishment of walking tracks and fire trails.
Comment on unburnt heaps within reserve coming into summer.	Discussed with Landcare group member on informing Council Fire and Bushland Management on heaps they make to be burnt. Explained Council endeavour to have all heaps burnt by October each year prior to summer.
Comments on trees within reserve with orange paint and labels.	Showed location and explained Council Fire and Bushland Managements vegetation monitoring program within reserve. Landcare Group member commented on vegetation monitoring Landcare Group undertook in 2000 and happy to share.
Comment on masked owl habitat within reserve.	Explained Council Fire and Bushland Managements planning methodology used required prior to operations eg: Natural Values Atlas searches, consultation with DPIPWE specialists and relevant legislation.
Concerns on future use and advertised development within the reserve.	Explained not within scope of Bushfire Management Plan review and reviewers limited knowledge on proposal. Commented as the reserve has been mapped as bushfire-prone area under the *Clarence Interim Planning Scheme 2015.* Any future developments within or adjacent may require a Bushfire Risk Assessment as per *Planning Directive No.5, Bushfire-Prone Areas Code.*

COMMUNITY CONCERNS and COMMENTS	COUNCIL'S COMMENT
A written submission stated concerns that they thought the TFS ran out of water during a previous fire within the reserve.	Commented fire trucks water storing capacity and the regular locations of fire hydrants within surrounding area.