Clarence City Council

Bushfire Management Plan

Canopus-Centauri Bushland Reserve
Mount Rumney

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 Canopus-Centauri Bushland Reserve prepared by AVK Environmental Management and North Barker Ecosystem Services and will operate for a period of 5 years after which another review 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 and adjoining 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:

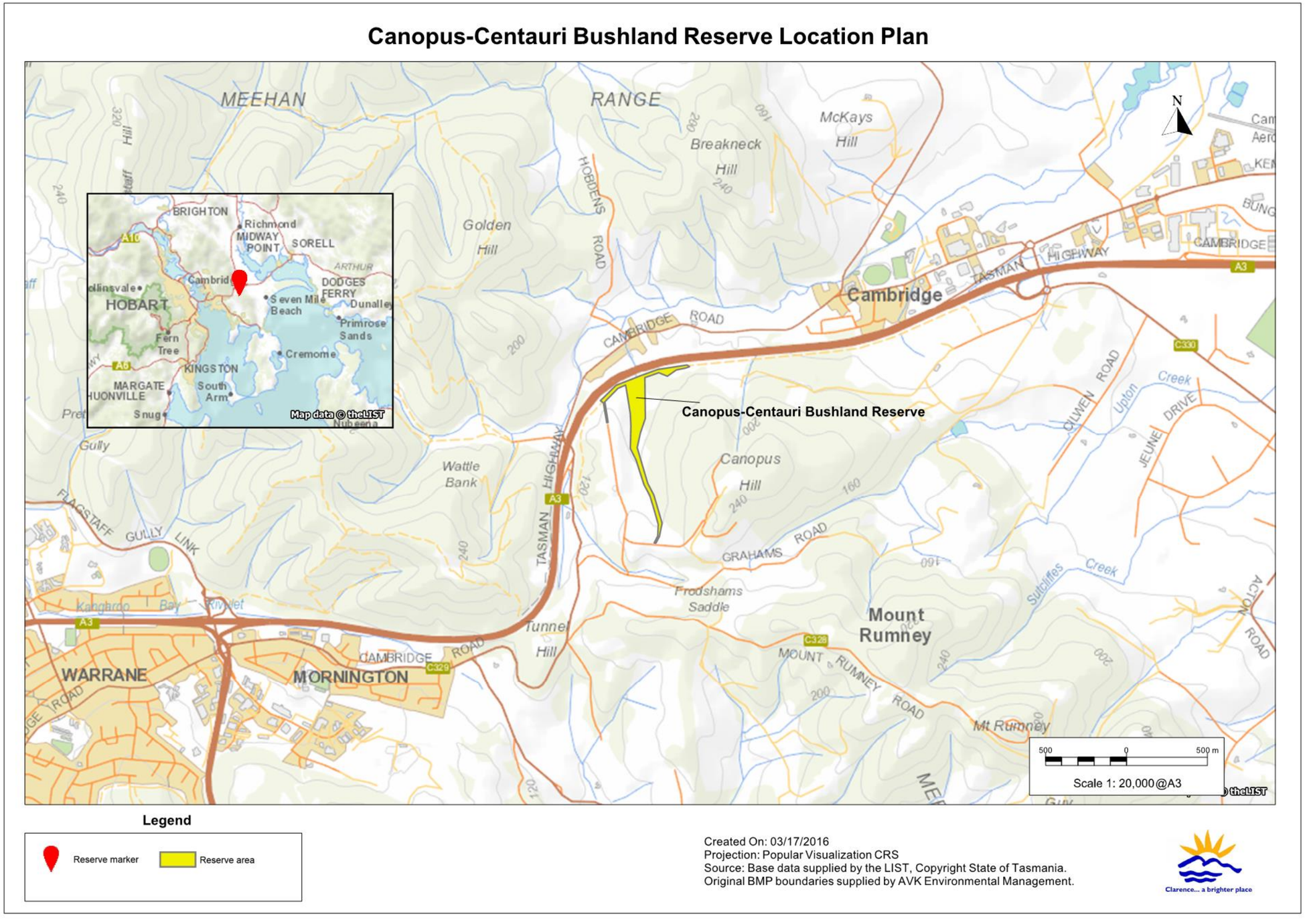
- Target area for maximum risk reduction
- reduce bushfire hazard to protect assets from bushfires
- maintain the long-term viability of the native vegetation in the reserve
- Assist in the removal of weeds and the regeneration of degraded bushland.

1.2 Location and Description

The reserve is located at the bottom of a small valley between Centauri Drive and Canopus Hill (see figure 1). The reserve covers approximately 6.5^{ha} and is about 1 km long, about 100 m wide at the northern end and tapering to only about 10m wide at the southern end. It is bounded by the Tasman Highway to the north, Canopus Road to the south, properties along Centauri Drive to the west and a large area of private bushland on Canopus Hill to the east.

Canopus-Centauri Bushland 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



1.2.1 Geology and Soils

The higher, southern portion of the reserve is on Jurassic dolerite whereas the northern portion is on Permian siltstones and sandstones.

Soils in the reserve range from brown soils on dolerite at the southern end to grey-brown podzolic soil on the Permian sediments. Both soil types generally have a low to moderate erosion risk, though the podzolic soil is prone to piping and subsequent gully formation if the vegetation cover is removed.

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. *Eucalyptus ovata* forest and woodland (DOV) occupies most of the valley with *Eucalyptus amygdalina* forest and woodland on mudstone (DAM) on the higher slopes at the northern end.

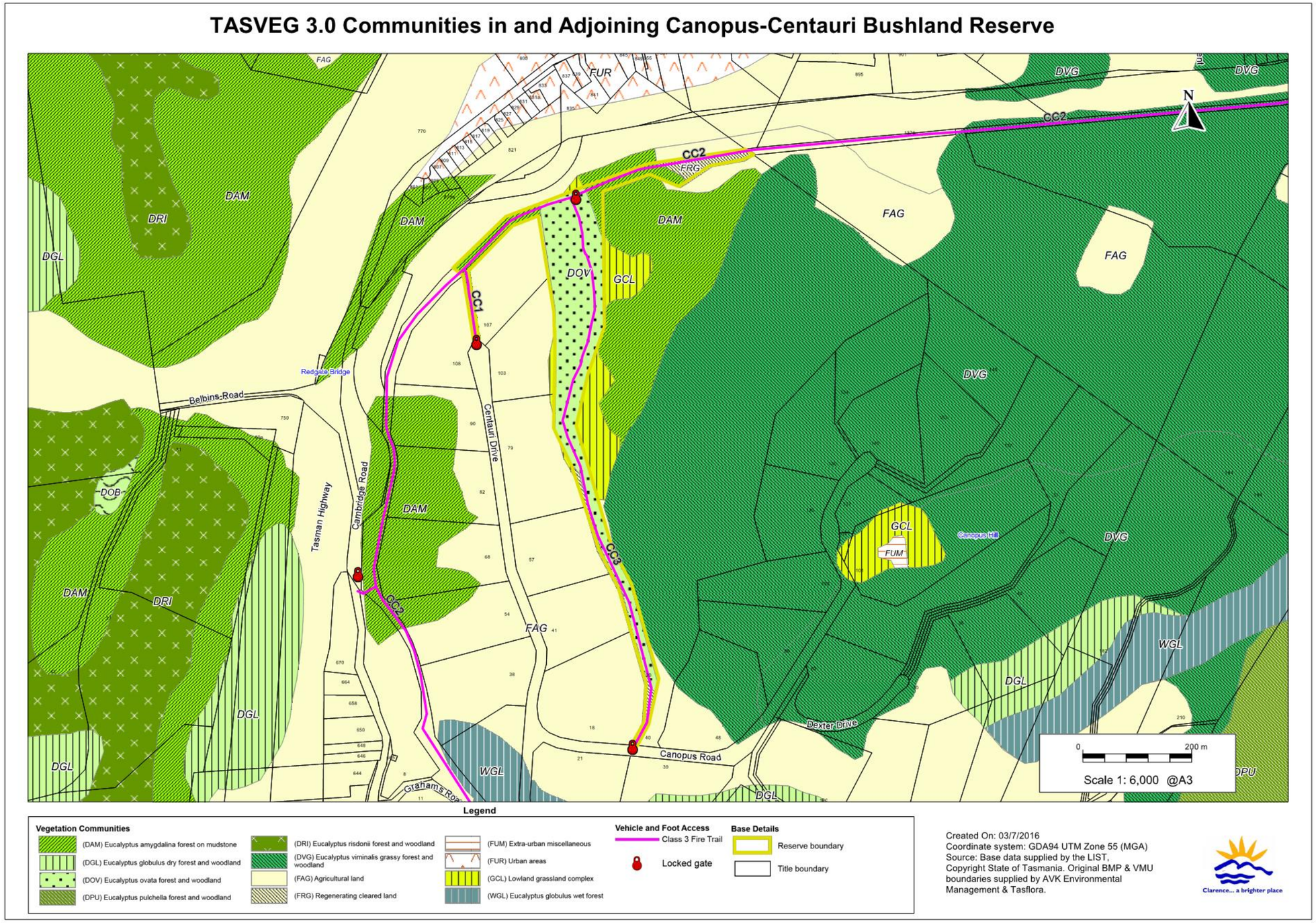
Eucalyptus ovata forest and woodland (DOV) is listed as a threatened native vegetation community under the *Nature Conservation Act 2002.*

There are small areas of previously cleared land at the northern and southern end of the reserve that are in the process of returning to bushland with the assistance of plantings by the Mount Rumney Landcare Group Inc. These plantings need to be maintained as per class 3 fire trail standards as outlined in MP1 of *Bushfire Management Strategy - Best Management Practice Guidelines*. Future plantings need to be in accordance with section 3.7 Bushland Management of this BMP, e.g. planting should not be allowed within 2m of the edge of fire trails.

1.2.3 Reserve Usage

Historically the reserve formed part of an old farm with some sections being grazed by livestock. The presence of a number of large, mature trees indicates it was never completely cleared. A walking track runs through the reserve from Canopus Road to Centauri Drive. Usage is limited to nearby residents and Councils Fire and Bushland Management Crew.

Figure 2 – Vegetation types in the reserve



1.3 Bushfire Management Objectives

Bushfire management within the Canopus-Centauri Bushland Reserve will meet the following broad management objectives:

1. Protection of life, assets and adjoining property from bushfire
2. Minimise the risk of fires 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 bushfire, or bushfire management activities.

The actions recommended to attain each of these objectives are listed in section 4.1.

1.4 Reserve Management Responsibilities

Management of the reserve is the responsibility of the Clarence City Council. 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".

The reserve was initially established as part of the permit conditions (*Threatened Species Protection Act 1995*) for the Clarence Waste Water Reuse Scheme. Consequently, management priorities for the reserve are maintaining and enhancing habitat values for threatened flora and the swift parrot.

1.4.1 Reserve Management Plan

There is no general management plan for the reserve; however it is covered by the Strategic Fire Management Plan for the Meehan Range Region (AVKEM, 2007).

2. Bushfire Risks

Extreme fire 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 and Causes

Documentation on bushfires/planned burning adjacent to the reserve started in 1981. There are no documented bushfires impacting the reserve during this period.

Recorded bushfire history (1981-2015) impacting adjacent land to the reserve is shown on figure 3. The most significant bushfire adjacent to the reserve was in the Meehan Range to the west in November 2006 and burnt approximately 800^{ha}, the cause being arson.

Data supplied by the TFS and Clarence City Council showed that within the duration of the previous BMP (2011-2015) the TFS attended no incidents within the reserve.

2.1.1 Bushfires

No bushfires have been recorded impacting the reserve.

2.1.2 Planned Fires

No planned burning has been conducted within the reserve by Councils Fire and Bushland Management during the previous BMP.

TFS records and The Meehan Range Strategic Fire Management Plan (AVKEM, 2007) shows that a planned burn was proposed for the western slopes of Canopus Hill in April 1986 that would have included the reserve. This burn never went ahead.

This burn has been re-scheduled by the TFS to be undertaken in autumn 2016 weather dependant.

Recorded planned burning adjacent to the reserve is shown on figure 4.

Figure 3 – Bushfire history (1981-2015)

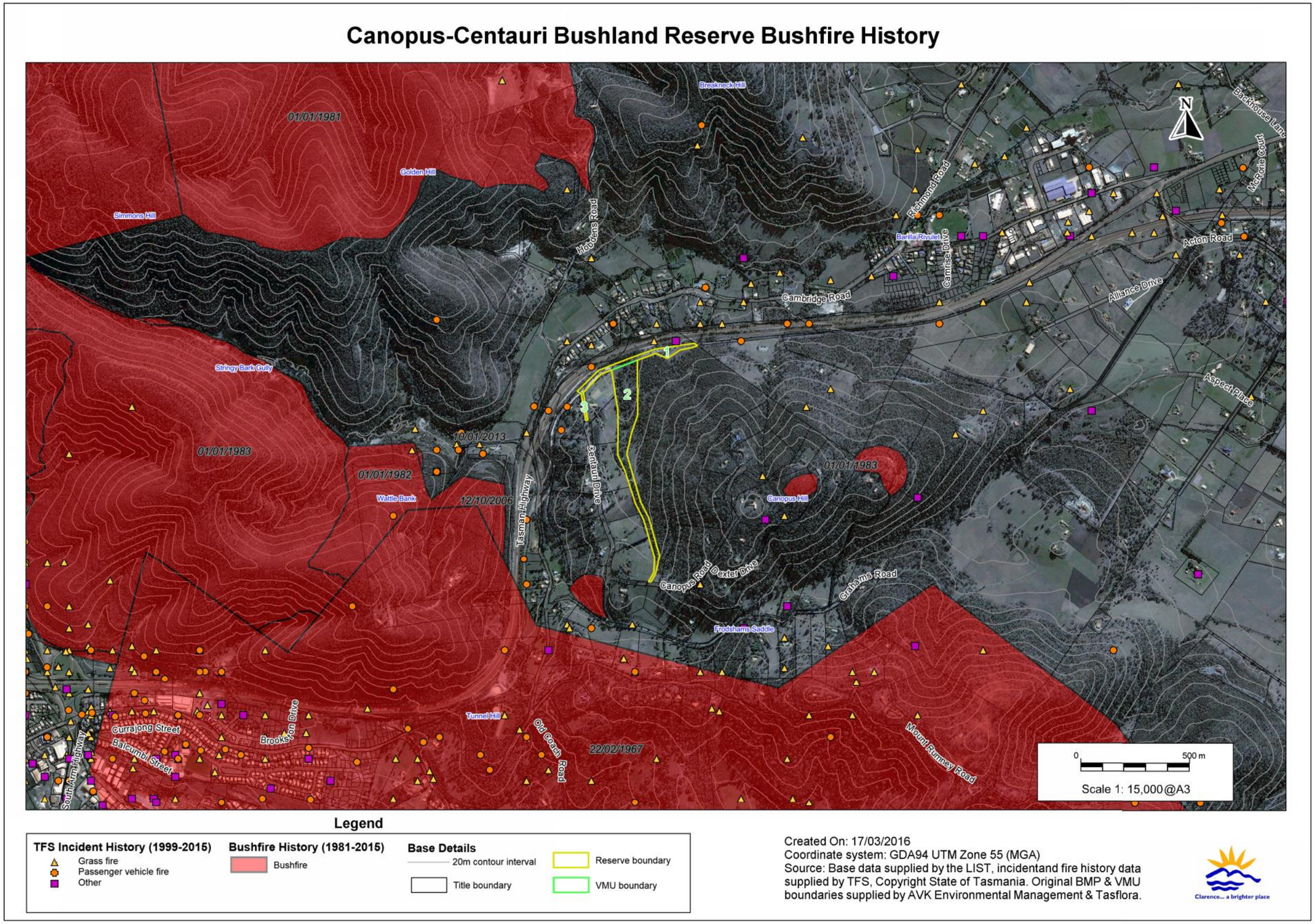
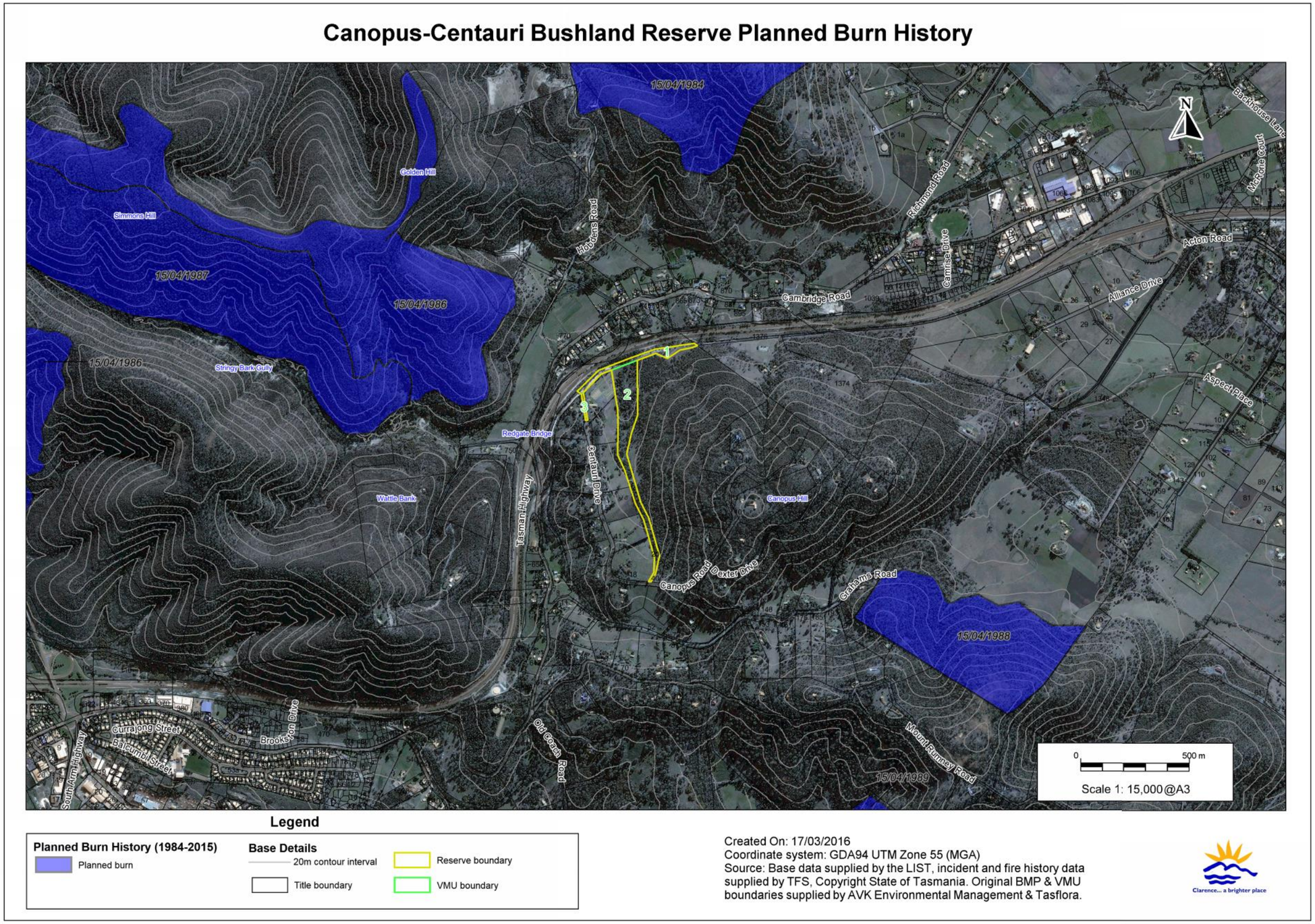


Figure 4 – Planned burn history (1984-2015)



2.2 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 fire. 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 of dead 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 fire. 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). 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 0.5m 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) bushfire 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 bushfire 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 the Canopus-Centauri Bushland 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 DOV DAM FRG	Moderate fuel loading. Surface fine fuels present in the form of leaves, twigs, bark, grazed grass tussocks and dry slashed blackberry (*Rubus fruticosus*). Leaf and bark fall around trees contributes to a gradual build-up of fuel, particularly around the base of trees. Near surface fuels are limited to grasses up to 1.5m in some dense aggregates, dead branches/saplings on ground and scattered dead dry stumps. Grass component of the fuel load builds up rapidly after fire. Limited elevated fuels present in the form of dead branches, saplings and *Bursaria spinosai*. Some mature *Eucalypt* sp. present with dead doles in addition to some dead standing.	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.

Fuel loading in the reserve was assessed at approximately 6-8$^{t/ha}$ in January 2016. Grass and scattered dead branches is the dominant fuel type in the reserve. The grass component means that fuel loads are likely to vary from year to year. This is a response to grass growth and mammal browsing rather than showing a gradual build up as expected with other fuel types. Bush regeneration and replanting of trees in the reserve will gradually increase fuel loads and therefore the bushfire hazard in the area of the plantings.

2.3 Bushfire Threat and Risk to Persons

The main bushfire threat to the Canopus-Centauri Bushland Reserve is considered to come from fires that start along the Tasman Highway at the northern end of the reserve. These have the potential to run uphill through the reserve, particularly if fanned by northerly winds.

As the reserve is narrow, any persons in the reserve during a bushfire could easily move to cleared areas around the dwellings along Centauri Drive. Centauri Drive is a dead end road with the only access running through bushland. Residents along the Centauri Drive could therefore be cut off during a major bushfire in the area. The only alternative access to Centauri Drive is through the reserve along the trail that follows the Clarence Recycled Water Scheme pipeline. As access to this trail is controlled by a locked gate, an adjoining resident should be provided with a key so it can be used by local residents in an emergency.

2.4 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.

2.4.1 Bushfire Risk to Natural Heritage Assets

The conservation value of the native plant communities in the Canopus-Centauri Bushland Reserve is given in table 2. The *Eucalyptus ovata* forest and woodland in the reserve is a threatened plant community, although the main threat to this plant community is from weed invasion rather than bushfire. 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.

No threatened fauna has been recorded within the reserve on the *Natural Values Atlas*; however the eastern barred bandicoot (*Perameles gunnii*) has recorded observations adjacent to the reserve.

The *Natural Values Atlas* identifies potential habitat present within the reserve for the following species: spotted-tail quoll *(Dasyurus maculatus)*, green and gold frog *(Litoria raniformis)*, chaostola skipper *(Antipoda chaostola)*, tussock skink *(Pseudemoia pagenstecheri)*, swift parrot *(Lathamus discolor),* Tasmanian devil *(Sarcophilus harrisii)*, masked owl *(Tyto novaehollandiae)*, forty-spotted paradalote *(Paradalotus quadragintus)* and grey goshawk *(Accipiter novaehollandiae).*

Dead trees and hollow logs are present providing nesting and foraging habitat for birds and mammals

The habitat requirements and preferred bushfire management for the eastern barred bandicoot (*Perameles gunnii*) and swift parrot *(Lathamus discolor)* is given in table 4.

Table 2 – Conservation values of native plant communities

TASVEG CODE	EQUIVALENT FLORISTIC COMMUNITY[1]	Conservation Status[2]
DAM	DRY-gAMmud Grassy *E. amygdalina* forest	Not threatened
DOV	DRY-gOV Grassy *E. ovata* forest	THREATENED NATIVE COMMUNITY

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

Figure 5 – Assets at risk from bushfire

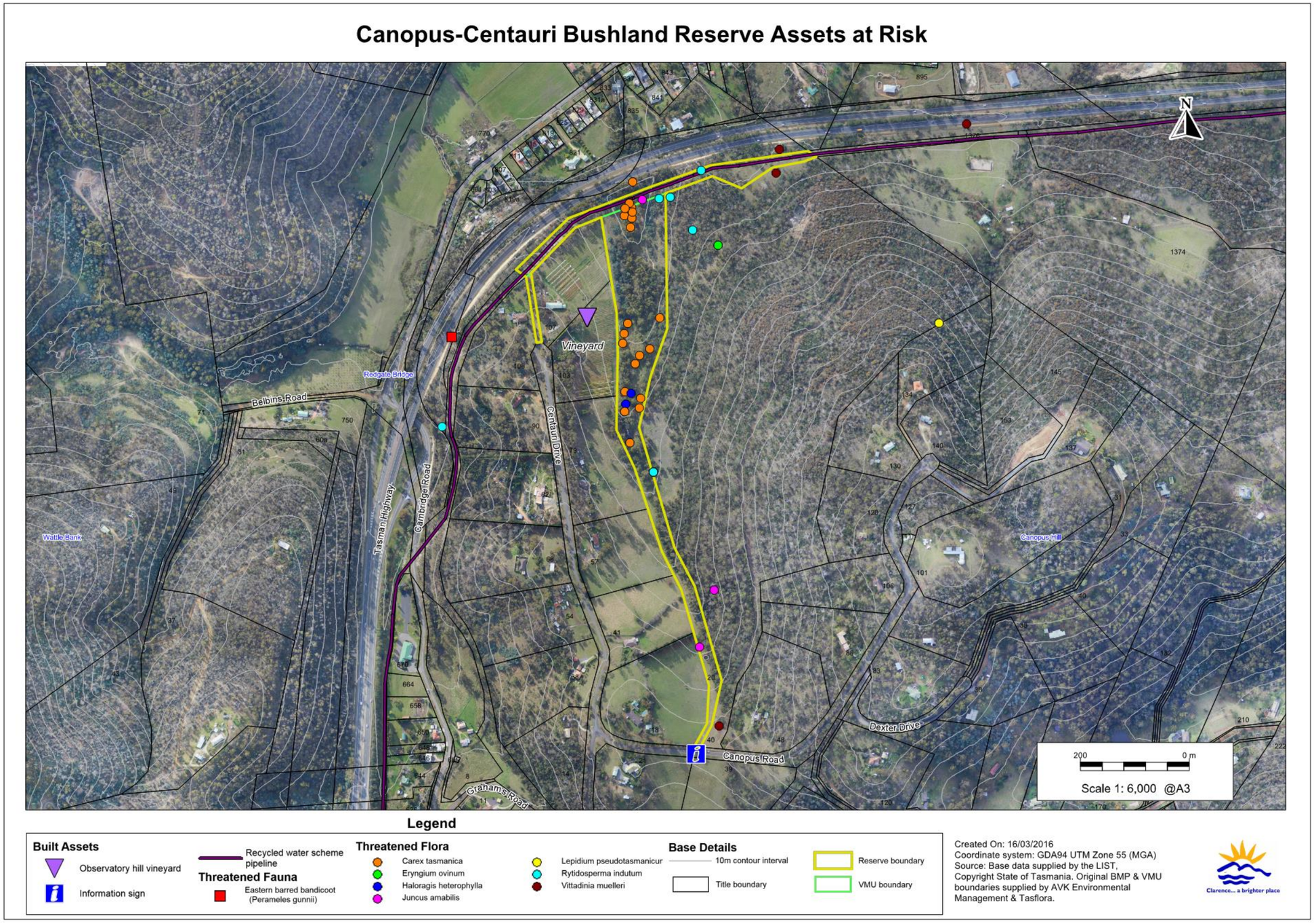


Table 3 - Plant species of conservation value and preferred bushfire management

SPECIES	CONSERVATION STATUS[1]	OCCURRENCE	RESPONSE TO BUSHFIRE AND MANAGEMENT	*ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999* (EPBC Act) STATUS
Carex tasmanica Curly sedge	Not listed	Previously recorded in Northern section of VMU 2.	Likely to regenerate from rootstock after bushfire.	VULNERABLE
Haloragis heterophylla Variable raspwort	RARE	Two recorded observations within VMU 2.	Likely to regenerate from rootstock after bushfire.	Not threatened
Juncus amabilis Gentle rush	RARE	Two recorded observations within reserve. One at northern end, one at southern end of VMU 2.	Regenerates from rootstock after bushfire.	Not threatened
Rytidosperma indutum Tall wallaby grass	RARE	Previously recorded near the eastern boundary of the park where it is abundant within the transmission line easement.	Likely to regenerate from rootstock and establish from seed after bushfire.	Not threatened
Velleia paradoxa Spur velleia	VULNERABLE	Localised population in vicinity of geological boundary between dolerite and sandstone.	Sets seed in second year from seedlings/rootstocks and disperses seed in summer. Schedule burns in autumn to allow plants to seed and provide a competition free seedbed and possible moisture to support seedling through winter.	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. The swift parrot feeds in the tree canopy and therefore an extensive, high-intensity bushfire which 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
Perameles gunnii Eastern barred bandicoot	Tasmanian Status Not Threatened	Grasslands (both native and introduced) and grassy woodlands. Dense cover of regrowth is likely to be unsuitable habitat. **Mosaic burning will ensure open habitats are maintained and help mitigate devastating bushfires.**	VULNERABLE

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	FIRE SENSITIVITY	FLAMMABILITY
DOV	Low	High
DAM	Low	High
FRG	Low	Moderate

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 bushfire 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 WILDFIRE	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 fire-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 fire-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 fire-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 bushfire 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 bushland in the reserve in Pyrke & Marsden-Smedley (2005) indicates that it 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.

2.4.2 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. This is more likely to be a problem in small reserves surrounded by urban areas than in the Centauri-Canopus Reserve which adjoins extensive bushland on Canopus Hill.

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 MAPPING UNITS	FIRE IMPACTS AND BUSHFIRE MANAGEMENT AIMS
Grassy dry sclerophyll forests and woodlands	
DOV – *Eucalyptus ovata* forest and woodland DAM – *Eucalyptus amygdalina* forest on mudstone	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. Overfrequent burning regimes in the past within much of forest overlying mudstones has contributed to loss of topsoil and erosion. 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.** **Exclude bushfire from most areas on mudstone, which due to low fertility have low biomass growth rates and are drought stressed.**

2.4.3 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 is no known Aboriginal or European cultural heritage assets within the reserve. There are also no built assets within the reserve that are considered at risk from bushfire, other than perimeter fencing. The main external built assets that could be at risk from fires in the reserve are houses along Centauri Drive to the west of the reserve. Although not likely to be directly affected by a bushfire in the reserve, the grape vines in the Observatory Hill Vineyard to the west of the reserve could be affected by smoke from bushfires in the reserve. Bushfire smoke during the period when the grapes are ripening can taint the wine produced from them and reduce its value.

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. Other assets, such as Aboriginal heritage sites, 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" in table 7 if these assets are found in the reserve.

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.

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 along Centauri Drive	3	3	1	2	0.2	2	6	43 Low		Advise resident of the need to maintain an adequate defendable space around their dwelling. No works required within the reserve.
Grape vines in the Observatory Hill Vineyard									Grapes may be tainted by smoke from bushfires.	Consult with vineyard owner before burning in the reserve. Maintain a 5m wide fuel break along the western boundary of reserve adjoining the vineyard.

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 for Canopus-Centauri Bushland Reserve, a review of the success of the implementation of the recommendations in the previous BMP was carried out. The review found that of 13 recommendations, 4 had been fully implemented, 4 had been partly implemented, 4 not applicable due to no bushfires or planned burning impacting the reserve during the previous BMP, and 1 had not been implemented. The recommendation that was not implemented was vegetation monitoring. This is due to the small size of the reserve and larger bushland reserves have taken priority in establishing monitoring programs.

The full findings of the review are in Appendix A.

3.1.2 Planned Burning

There are records of a proposed planned burn in 1986 on the western side of Canopus Hill. During the BMP review process it was confirmed that this burn was not carried out.

The portion of the reserve to the east of the creek is included in Fire Management Unit M46 in the Meehan Range Fire Management Strategy (AVKEM, 2007). Unit M46 includes the lower slopes of Canopus Hill to the east of the reserve. It is a "strategic hazard management unit" with the stated aim of reducing the rate of spread of bushfires burning up Canopus Hill. The recommended prescription is to burn the unit whenever fine fuel loads exceed 10 tonnes per hectare.

A similar polygon to Unit M46 was planned to be burnt in 2015, however unfavourable conditions postponed the burn. This burn has been re-scheduled to autumn 2016 by the TFS.

With this planned burn scheduled, it is not considered necessary to burn the reserve, either for hazard reduction or ecosystem management. Although broad-area burning should be excluded, there is scope for the use of fire to assist in weed control, and the removal of fallen branches and trees through heap burning.

3.1.3 Vehicle Access Routes and Foot Tracks

There are five vehicle access points to the reserve, four have locked gates, and one is unrestricted (figure 6). Locked access points are at the southern end of Canopus Road, the northern end of Centauri Drive next to Observatory Hill Vineyard, Alliance Drive (between 26 and 18 Alliance Drive) and Cambridge Road (opposite 670 Cambridge Road). Access from the southern end of Canopus Road uses the fire trail CC3 and links on to the fire trail CC2 that runs along the Clarence Recycled Water Scheme pipeline parallel with the Tasman Highway. Both Alliance Drive and Cambridge Road give access to CC2. An additional locked gate is at the junction of CC2 and CC3.

The unrestricted vehicle access point is through Council owned vacant land accessed from Grahams Road. This access joins onto CC2. The reserve can also be accessed from adjoining properties.

The location of vehicle access points and fire trails are shown on 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.*

In November 2015, CC1, CC2 and CC3 were been identified as strategic fire trails under the Hobart Fire Protection Plan. Strategic fire trails are those that provide important access routes for firefighting, through or along the perimeter of bushland areas, and are potential control lines for major fires. These trails need to be maintained to a standard that allows for all weather vehicle access by fire fighting vehicles. This will generally be Class 3 in the PWS fire trail classification system (Hobart Fire Management Area, 2016).

Throughout the BMP review process, community concern was shown by residents towards limited emergency egress in event of bushfire. Many individual dwellings, and two main settlements on the Meehan Range, Dulcot and the Canopus Hill/Mount Rumney area, have only one access point. Residents in these areas could be cut off from assistance in the event of a major bushfire, particularly if their only access is from the north (AVKEM, 2007).

This BMP recommends the establishment of a class 3 fire trail from Mount Rumney Road through to the proposed subdivision on 150 Houston Drive, Mount Rumney following allocated public open space.

Figure 6 – Vehicle and foot access

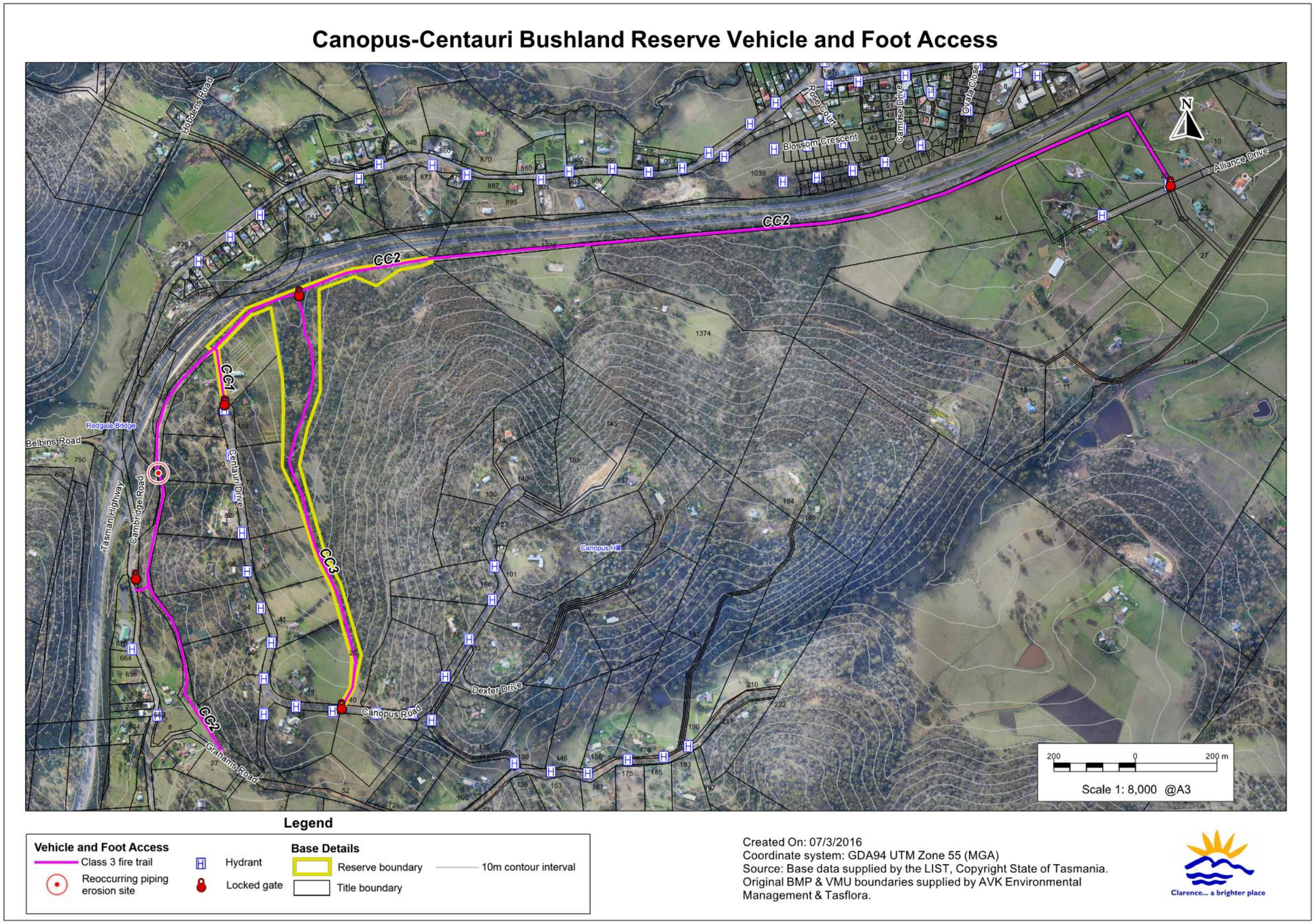


Table 8 - Condition and maintenance of fire trails

Assigned vehicle usage class (see Management Procedure 1):	Maintenance priority:
Class 1 – all 2WD and 4WD vehicles	**High** priority - major through routes and fire control lines
Class 3 – all weather 4WD, light and heavy 4WD vehicles (category 3, 4 & 5 tankers)	**Medium** priority - important access and escape routes and minor fire control lines
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.	**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
CC1	3	YES	High	Runs from the end Centauri Drive to CC2. Trail is in good condition and meets usage class 3 standards. Tree branches are encroaching on the trail in places.	Inspection and maintenance as specified in MP2. Cut back encroaching vegetation.	NO

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
CC2	3	YES	High	Starts below bus stop on Grahams Road (opposite 27 Grahams Road, Mount Rumney, following the route of the Clarence Recycled Water Scheme pipeline along the northern boundary of the reserve, exiting 20 Alliance Drive, Cambridge (between 26 and 18 Alliance Drive) through slip rail. Maintained by annual slashing. Trail is in good condition and meets usage class 3 standards. Tree branches are encroaching on the trail in places. Junction CC2 and CC3 can get boggy after prolonged rain. Some culverts unmarked and can be obstructed by grass.	Inspection and maintenance as specified in MP2. Cut back encroaching vegetation. Install cat's eye markers at head and tail of culverts	Recycled Water Scheme pipeline beneath fire trail. Concrete pressure main ducts exposed in sections. Section prone to piping erosion below 90 Centuri Drive adjacent to Concrete pressure main duct. Has had two remedial works during 2014/2015.

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
CC3	3	YES	High	Runs from the southern entrance on Canopus Drive to CC2, maintained by annual slashing. Trail is unformed, northern section can become boggy after prolonged rain. Trees/tree branches encroaching on fire trail in places. Small dam encroaching on section.	Inspection and maintenance as specified in MP2. Clear vegetation encroaching on fire trail to usage class 3 standards. Reshape edge of dam encroaching on fire trail below 57 Centauri Drive.	Vipers bugloss (*Echium vulgare*[4]) present. Machinery to be washed prior to leaving site. Contains threatened plant species *Carex tasmanica*[3], *Haloragis heterophylla*[2], *Juncus amabilis*[2] and *Rytidosperma indutum*[2]. Consultation with DPIPWE Threatened Species Section required prior to disturbance.

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. *Environment Protection and Biodiversity Conservation Act* 1999

4. Declared weed under Tasmanian *Weed Management Act* 1999

3.1.4 Water Supply

There are five dams along the creek that runs through the reserve. All are easily accessible but as the creek only flows periodically the dams are often empty. Water for firefighting and bushfire management can be easily obtained from fire hydrants in Canopus Road and Centauri Drive.

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 backburning operations. Currently there are no standards or guidelines for fuel breaks in Tasmania. A 3m to 5m wide fuel break is currently maintained along the eastern boundary fence adjoining the vineyard. This was re-established in 2015 and slashed annually.

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.

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.

All of the dwellings adjoining the reserve have enough room to maintain adequate defendable spaces within the lots. VMU 3 is managed as an outer zone. This is the only outer zone within the reserve and complements the defendable space on adjoining properties. Maintaining as an outer zone ensures that CC1 can be used safely during a bushfire.

3.1.6 Bushfire Detection and Suppression

Canopus-Centauri Bushland Reserve is highly visible from surrounding dwellings and roads, and it is likely that any fires would be promptly reported. As the reserve is long, narrow, and at the bottom of a valley, bushfires are likely to quickly spread beyond the reserve. The planned burn scheduled for autumn 2016 on the property to the east of the reserve will help to slow the rate of spread of bushfires moving out of the reserve and make them easier to control.

3.2 Weeds

A detailed weed survey was not undertaken as part of this review, merely observations from field work.

Several weed species found in the reserve are classified as declared weeds under the Tasmanian *Weed Management Act 1999* and/or Weeds of National Significance (WONS). Where possible these weeds will be targeted as a priority to prevent their further spread.

Blackberry *(Rubus fruticosus)* and serrated tussock (*Nassella trichotoma)* are present declared weeds and WONS.

Spanish heath *(Erica lusitanica)* and vipers bugloss *(Echium vulgare)* are present declared weeds in the reserve that are not listed in WONS.

Other environmental weeds present within the reserve are: Radiata pine *(Pinus radiata)*, spear thistle *(Cirsium vulgare)* and sweet briar *(Rosa rubiginosa)*.

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 BMP was being revised and inviting them to have input by sending in a written submission, attending a community "walk and talk" in the reserve, or by contacting the reviewer directly. The community "walk and talk" was held in the reserve on 8th November 2015 and was attended by two community members (both members of the Mt. Rumney Landcare Group Inc.) and a Council representative. One written comment was received and one comment was discussed by telephone. 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 issue of concern discussed was the lack of egress routes for residents in the event of bushfire.

3.4 Bushfire Risk Reduction Strategy

The overall bushfire risk reduction strategy recommended for the Canopus-Centauri Bushland Reserve can be summarised as follows:

- Reduce ignitions through prosecution of arsonists, and prompt reporting of fires.
- Maintain access points and fire trails to enable the TFS to rapidly contain fires that start in the reserve.
- Maintain defendable spaces in the reserve to protect assets within and adjoining the reserve.
- Encourage neighbouring residents to maintain defendable spaces around their homes.

3.5 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 not implemented during the previous BMP, and has a heavy influence in the effectiveness of this BMP.

In particular, adjoining residents and Landcare group members should be given an understanding of the outer zone/FMZ in VMU 3 and its management regime, the fuel break adjacent to Observatory Hill Vineyard and class 3 management standards for fire trails.

As a key stakeholder the Mt. Rumney Landcare Group Inc. should be consulted during the planning stages.

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 or near their home, they should be encouraged to contact Council's Fire and Bushland Vegetation Management Co-ordinator.

3.6 Planned Burning

As the bushland on Canopus Hill to the east of the reserve is scheduled for burning in autumn 2016, it is not considered necessary to carry out planned burns in the reserve for the duration of this plan. Heap burning may be utilised for disposing of weeds, disposing of vegetation from maintaining the outer zone or accumulated dead wood.

3.6.1 Vegetation Management Units (VMU)

The bushfire management program in this plan is based on the division of the reserve 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 fire 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.

3.7 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 establishment 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. Management Procedure (MP) 8 in *Clarence City Council Bushfire Management Strategy - Best Management Practice Guidelines* includes guidelines for integrating weed management with management burning, and for minimising the risk of weed invasion following bushfires. These guidelines should ensure that bushfires in the reserve do not worsen existing weed problems, or cause weeds to spread. Where patch burning of weeds is required, pre-treatment with herbicide should be carried out at least 3 months in advance of the burn to allow treated weeds to desiccate.

Successful implementation of the patch and pile burns recommended in this plan requires trained personnel and special equipment. 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 patch and pile 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.

Mt. Rumney Landcare Group Inc. has previously been working within the reserve on regeneration and weed control projects in the reserve. 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 BMP to ensure that they do not compromise bushfire protection measures proposed in this plan. In general, plantings should not be allowed:

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

During site visits for the review process a healthy stocking of natural regen of *Eucalyptus ovata* was observed in the lower section of the reserve. Gumleaf skeletoniser *(Uraba lugens)* is present within the regen. Gumleaf skeletoniser has been present for some years within the reserve and can cause minor damage each winter and spring, but has been known to occur in outbreak proportions. Severe skeletonising may kill small trees, particularly if it occurs in more than one season; less severe damage or defoliation in only one season slows growth (Forestry Tasmania, 1999).

Figure 7 – Vegetation management units in the reserve

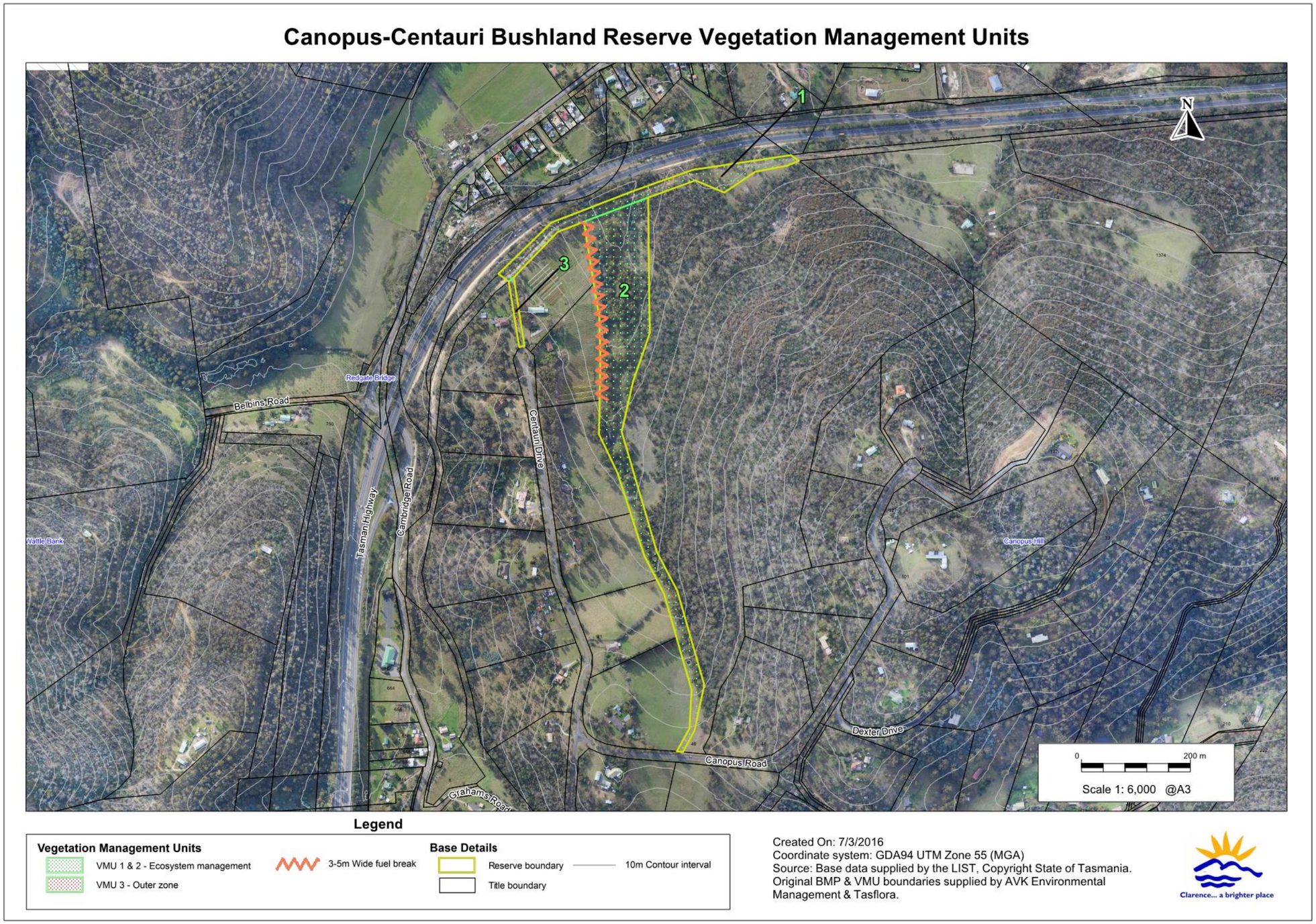


Table 9 – Bushfire management in the reserve

VMU[1]	AREA (ha)	BUSHFIRE MANAGEMENT OBJECTIVES and PRESCRIPTIONS	NOTES and PRECAUTIONS [2, 3, 4]	LAST BURNT	NEXT BURN
1 DAM FRG	1.37	OBJECTIVES: Maintain the structure and floristics of the vegetation community. Maintain groundcover to minimise erosion. Allow recruitment of canopy species. Reduce the extent and density of weeds. PRESCRIPTION: No planned burning for the duration of this plan.	Contains rare and vulnerable plant species *Carex tasmanica*[3], *Juncus amabilis*[4], *Rytidosperma indutum*[4] and *Velleia paradoxa*[4]. Obtain a permit from DPIPWE Threatened Species Section before burning or other management activities that may adversely affect these species. Pile, and/or patch burns in conjunction with weed control to assist with regeneration. **Notify Observatory Hill Vineyard prior to any burning.**	Not known	Patch or pile burns only
2 DAM DOV FRG	4.96	OBJECTIVES: Maintain the structure and floristics of the vegetation community. Maintain groundcover to minimise erosion. Allow recruitment of canopy species. Reduce the extent and density of weeds. PRESCRIPTION: No planned burning for the duration of this plan. Maintain a 3m to 5m wide fuel break along the boundary with Observatory Hill Vineyard.	Contains rare and vulnerable plant species *Carex tasmanica*[3], *Haloragis heterophylla*[4], *Juncus amabilis*[4] and *Rytidosperma indutum*[4]. Obtain a permit from DPIPWE Threatened Species Section before burning or other management activities that may adversely affect these species. Consult DPIPWE Threatened Species Section before burning. Contains DOV[2]. Pile, and/or patch burns in conjunction with weed control to assist with regeneration. Avoid burning near *Eucalypt Sp.* regen. **Notify Observatory Hill Vineyard prior to any burning.**	Not known	Patch or pile burns only
3 DAM	0.13	OBJECTIVES: Maintain as outer zone to protect adjoining dwellings. Reduce the extent and density of weeds. PRESCRIPTION: See MP 5 in the Best Management Practices Guidelines for outer zone specifications.	Pile burns only if required. **Notify Observatory Hill Vineyard prior to any burning.**	Not known	Pile burns only

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

[2] *Nature Conservation Act 2002*

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

[4] Tasmanian *Threatened Species Protection Act* 1995

4. 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 wildfires, 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 management procedures (MP) 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 BMP 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.

4.1 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 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 park, management of strategic fire trail standards 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	Educational material distributed to adjoining residents, reserve users and other interest groups.
2) Implement the bushfire protection measures in section 2.4 for protection of built assets in and around the reserve.	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) 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.
4) Ensure all strategic fire trails shown on figure 5 are inspected and maintained to their usage class standard at all times according to MP 2 and fire trail signs are in place and legible.	2, 4	ROU - A	Clarence City Council Fire and Bushland Management	Access routes inspected as required in MP 2, and maintained in a trafficable condition for fire service vehicles.

RECOMMENDED ACTION	OBJECTIVE (section 1.3)	PRIORITY	RESPONSIBILITY	PERFORMANCE INDICATORS
5) Inspect gates regularly to ensure that locks are in place and functioning. Ensure that local TFS brigades and other emergency services have keys to the gates on trails giving access to the reserve. Provide a key to the gate at the end of Centauri Drive to the owner of the Observatory Hill Vineyard.	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. Key to the gate at the end of Centauri Drive supplied to a suitable local resident.
6) Carry out bushfire management according to the schedule in table 9.	2, 3, 4, 5	E - A/S	Clarence City Council Fire and Bushland Management	Structure and floristics of native plant communities maintained.
7) Integrate planned burning into the weed management and bush regeneration program for the reserve according to MP 8. Ensure follow-up weeding is carried out after bushfires.	3, 5	REC – A/S	Clarence City Council Fire and Bushland Management Mt. Rumney Landcare Group Inc.	All declared weeds and WONS removed, reduction in extent of other weeds.
8) Consult with the DPIPWE Threatened Species Section when carrying out bushfire management activities that may affect populations of threatened flora or fauna.	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.
9 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.

RECOMMENDED ACTION	OBJECTIVE (section 1.3)	PRIORITY	RESPONSIBILITY	PERFORMANCE INDICATORS
10) 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	BMP revised every 5 years.
9) Coordinate bushfire management, weed management and other management activities using the procedure in MP 9.	3, 5	REC - A	Clarence City Council Fire and Bushland Management Mt. Rumney Landcare Group Inc.	Meetings held as recommended in MP9 and the outcomes recorded.
10) 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 Tasmania Fire Service	All personnel are able to demonstrate the required level of training and minimum levels of equipment.
11) 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.
12) Establish class 3 fire trail from Mount Rumney Road through proposed subdivision on 150 Houston Drive, Mount Rumney following allocated public open space.	1	REC - 2A	Clarence City Council Fire and Bushland Management Clarence City Council	Established and adopted as strategic fire trail under Bushfire Management Strategy.
13) Reshape edge of dam encroaching on CC3 fire trail below 57 Centauri Drive.	1, 2, 6	REC - 1A	Clarence City Council Fire and Bushland Management	Dam still functions; when over flows, water does not run down fire trail. Safer for class 3 firefighting appliances to access fire trail.

References

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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 BMP for Canopus-Centauri Bushland 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 park 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 reserve has taken place. Two TFS community bushfire preparation events have been attended and represented by Council Fire and Bushland Management at Mount Rumney in 2015/2016.
2) Implement the bushfire protection measures in section 2.4 for protection of built assets in and around the reserve.	IS	The bushfire protection measures in section 2.4 have been implemented.
3) Implement the recovery procedures in MP 12 following planned burns and bushfires.	NA	No planned burning or bushfires have impacted the reserve during previous BMP.
4) Ensure all fire trails shown on figure 5 are inspected and maintained to their usage class standard at all times according to MP 2 and fire trail signs are in place and legible.	PI	Fire trails have been maintained to previous class 5 standards. Some revegetation plantings have taken place at Canopus Road entrance by Landcare group along fire trail edge. Important to advise Landcare group of section *3.7 Bushland Management* of BMP. Strategic fire trail signage to be installed.
5) 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. Provide a key to the gate at the end of Centauri Drive to the owner of the Observatory Hill Vineyard.	PI	All gates inspected regularly. TFS brigades have keys to Council locks. Key is yet to be provided to Observatory Hill Vineyard. At time of review vineyard is for sale. Recommend waiting for vineyard sale outcome prior to issuing key.
6) Carry out bushfire management according to the schedule in table 9.	IS	Bushfire management activities in table 9 have been carried out.

RECOMMENDED ACTION	CODE	COMMENT
7) Integrate planned burning into the weed management and bush regeneration program for the reserve according to MP 8. Ensure follow-up weeding is carried out after bushfires.	NA	No planned burning or bushfires has occurred within reserve for duration of previous BMP.
8) Consult with the DPIPWE Threatened Species Section when carrying out bushfire management activities that may affect populations of threatened flora or fauna.	NA	No bushfire management activities occurred within the reserve for duration of previous BMP requiring DPIPWE notification.
9 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.	NI	No vegetation monitoring has yet been established within reserve. No bushfires or planned burning impacted threatened or rare flora and fauna locations during previous BMP.
10) 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	Regimes and prescriptions have been analysed throughout life of previous BMP and incorporated into reviewed BMP.
11) Coordinate bushfire management, weed management and other management activities using the procedure in MP 9.	PI	Coordination has taken place between TFS and Council Fire and Bushland Management within reserve. Limited coordination between Landcare group and Council Fire and Bushland Management.
12) 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	Although no planned burning has occurred during previous BMP, extensive training has been delivered to Council Fire and Bushland Crew during term of previous BMP. Ongoing training will be recommended on a needs basis.
13) Record bushfire management activities and bushfires using the procedures in MPs 10 and 11.	NA	No planned burning or bushfires have impacted the reserve during previous BMP.

Appendix B

Summary of community concerns and comments

In the initial round of community consultation

COMMUNITY CONCERNS and COMMENTS	COUNCIL'S COMMENT
Residents concerned about emergency egress for Centauri Drive should access to Cambridge Road be blocked.	Acknowledged that this is an ongoing problem. During review process Council has identified potential additional escape route and working on establishing. Council also supports TFS recommendation to leave as early as possible in event of bushfire.
Request for Council to conduct planned burn on Council land adjacent to private property on Centauri Drive.	Will schedule planned burn for area in 2016-2021 planned burn program.
Mt. Rumney Landcare Group not aware of BMP for reserve, have been under direction from Council on where they can revegetate. Landcare group not aware that southern entrance to reserve from Canopus Drive is fire trail.	Council representative providing advice to Landcare group not from Councils Fire and Bushland Management and was not aware of fire trail location/standards. Community education process was not established and implemented at last review as recommended. Establishing communication strategy and including Landcare group high priority for reviewed BMP. Ensure Council Natural Areas Volunteer Coordinator aware of Councils Bushfire Management Strategy and reserves BMP.
Written response encouraging regular fuel reduction burning within reserve and all areas of Mt Rumney.	Agreed. Council's limitation to Bushfire Management Strategy is that it only deals with Council managed land. Council will continue relations with TFS and PWS to conduct future planned burns within Mt Rumney area.