Clarence City Council

Bushfire Management Plan

Pilchers Hill Reserve
Lindisfarne

Revised
January 2017
Clarence City Council

Contents

FIGURES

Page

TABLES

Page

PROJECT TEAM

Rob Whittle	- Clarence City Council - Fire and Bushland Vegetation Management Works Officer
Pat Marshall	- Clarence City Council – Fire and Bushland Vegetation Management Coordinator
Gregg Jack	- Clarence City Council – Systems Asset Officer

1. Introduction

This Bushfire Management Plan (BMP) is a revision and expansion of the previous BMP for Pilchers Hill 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 park. 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 park 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 park, and minimising the risk of injury or damage to assets in and surrounding the park.

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 park
- Assist in the removal of weeds and the regeneration of degraded bushland.

1.2 Location and Description

Pilchers Hill Reserve is located in the Meehan Ranges to the north of the suburb of Lindisfarne (see figure 1). The reserve is approximately 130^{ha} in size, and includes a prominent hill, Pilchers Hill siting at 140m above sea level. The reserve is part of a "scenic rim" of tree-covered hills on the eastern side of the Derwent River, and contributes significantly to the scenic appeal of the Hobart/Clarence region. The reserve is zoned as Environmental Living and Open Space under the *Clarence Interim Planning Scheme 2015*.

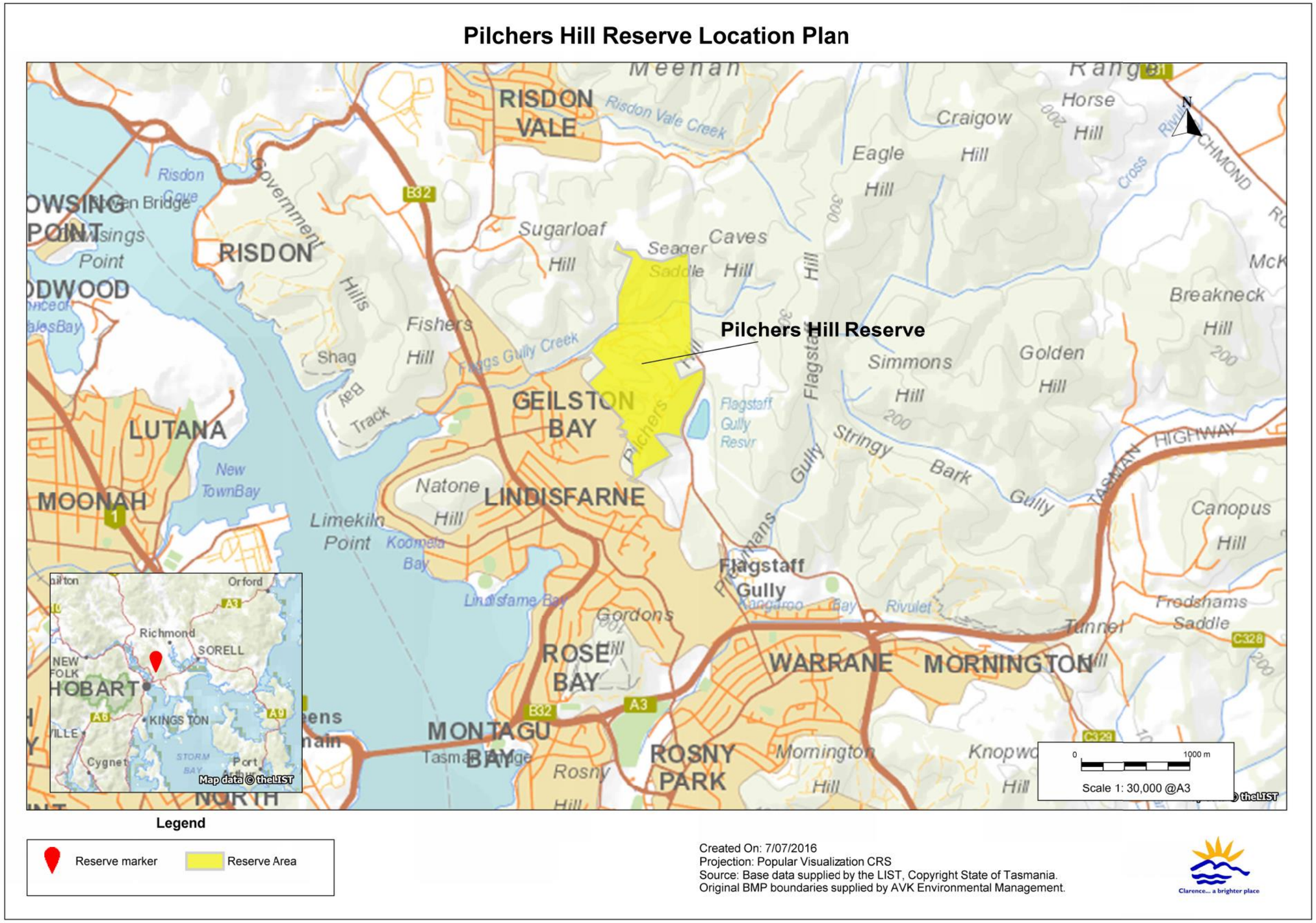
The reserve is bounded by residential allotments to the south zoned as Low Density Residential and General Residential, bushland with developed private lots to the west, and bushland on undeveloped private lots to the north and east, all zoned as Environmental Living.

A large quarry (Hanson Quarry) is also located on the eastern side of the reserve and zoned as Utilities and Rural Resource.

TasWater own a 2.4^{ha} allotment within the reserve which holds a roofed water reservoir. This has been identified in Table 6 and section 2.4.3 as an asset at risk from bushfire.

Pilchers 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



1.2.1 Geology and Soils

The geology of the reserve consists mainly of Permian fine sandstone, coarse siltstone, fossiliferous mudstone, with occasional thin conglomerate and limestone beds (Sinclair Knight Mertz, 1998). Soils formed on the sediments have uniform to duplex profiles with a high risk of sheet, rill, gully, tunnel and stream bank erosion if exposed (Sinclair Knight Mertz, 1998).

To the east of Flagstone Gully Road is fine to medium grained Jurassic dolerite overlain by gradational to uniform soils with moderate fertility and a low sheet erosion and moderate gully erosion risk (Sinclair Knight Mertz, 1998).

Sections within the reserve have been identified as Landslide Hazard Area under the

Clarence Interim Planning Scheme 2015 (Figure 2).

1.2.2 Vegetation

The major vegetation communities in the reserve are shown in figure 3. 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 a range of dry forest plant communities including; *Eucalyptus amygdalina* forest and woodland on mudstone (DAM) and *Eucalyptus globulus* dry forest and woodland (DGL) with smaller areas of *Eucalyptus viminalis* grassy forest and woodland (DVG), *Eucalyptus tenuiramis* forest and woodland on sediments (DTO) and *Eucalyptus risdonii* forest and woodland (DRI).

Eucalyptus globulus dry forest and woodland (DGL), *Eucalyptus risdonii* forest and woodland (DRI) and *Eucalyptus tenuiramis* forest and woodland on sediments (DTO) are listed as threatened native vegetation communities under the *Nature Conservation Act 2002.*

The reserve also holds a major electricity transmission line easement running north-west to south-east through the reserve.

Gumleaf skeletoniser *(Uraba lugens)* was observed within the *Eucalypt* regeneration in some sections of VMU 3. Gumleaf skeletoniser 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).

1.2.3 Reserve Usage

Pilchers Hill Reserve is an important recreational area for activities such as; walking, mountain bike riding, dog exercising and jogging. The reserves extensive tracks and fire trail network links into the fire trail network throughout the Meehan Ranges (not controlled by Council). This provides access to Rocky Tom (to the east on private property) which is used frequently for rock climbing.

Illegal motorbike usage is evident within the reserve as is illegal firewood cutting. Both are very hard to restrict given the location and adjacent private property.

TasWater has infrastructure within the park (figure 6) and access frequently.

Figure 2 – Clarence Interim Planning Scheme 2015

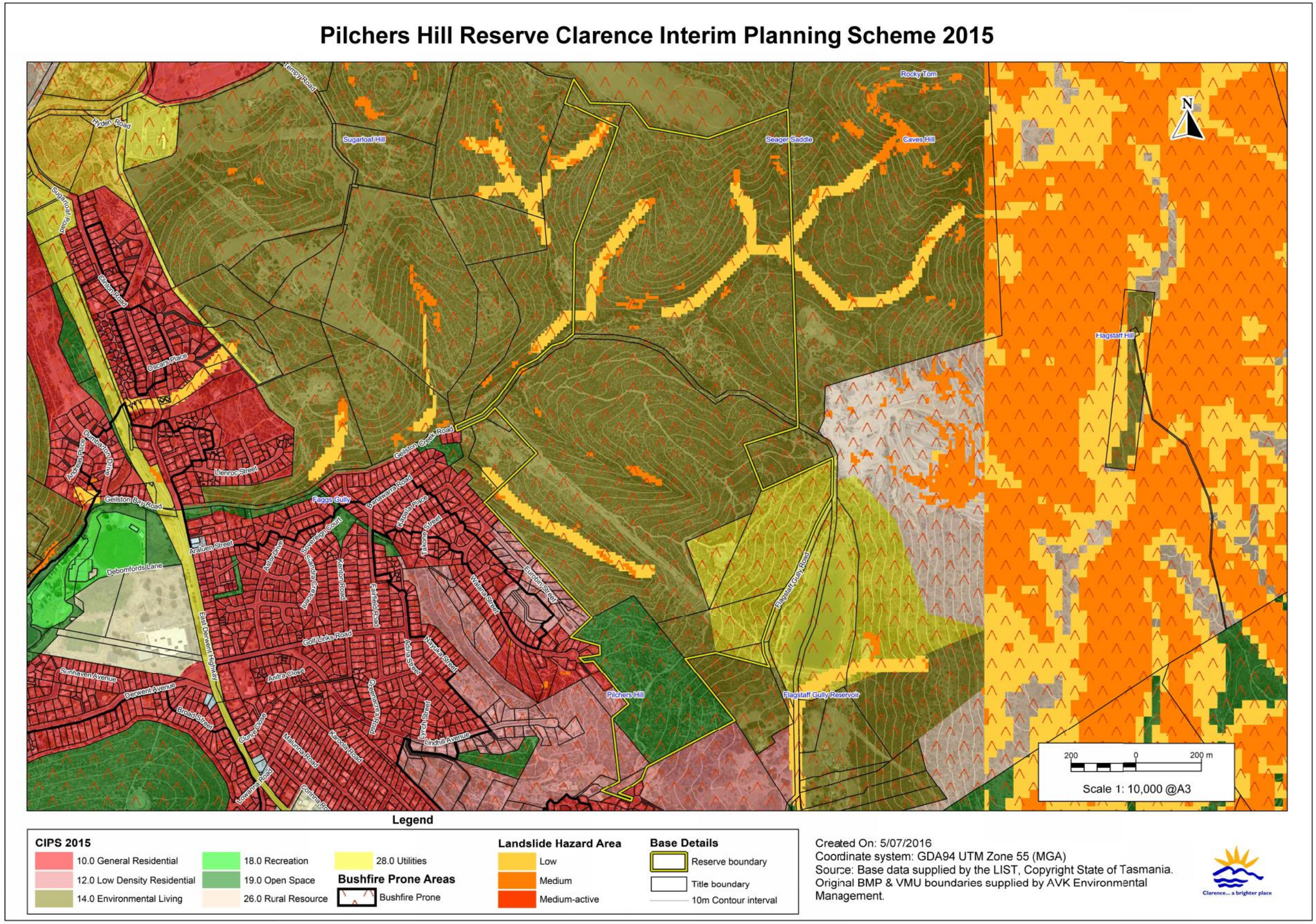
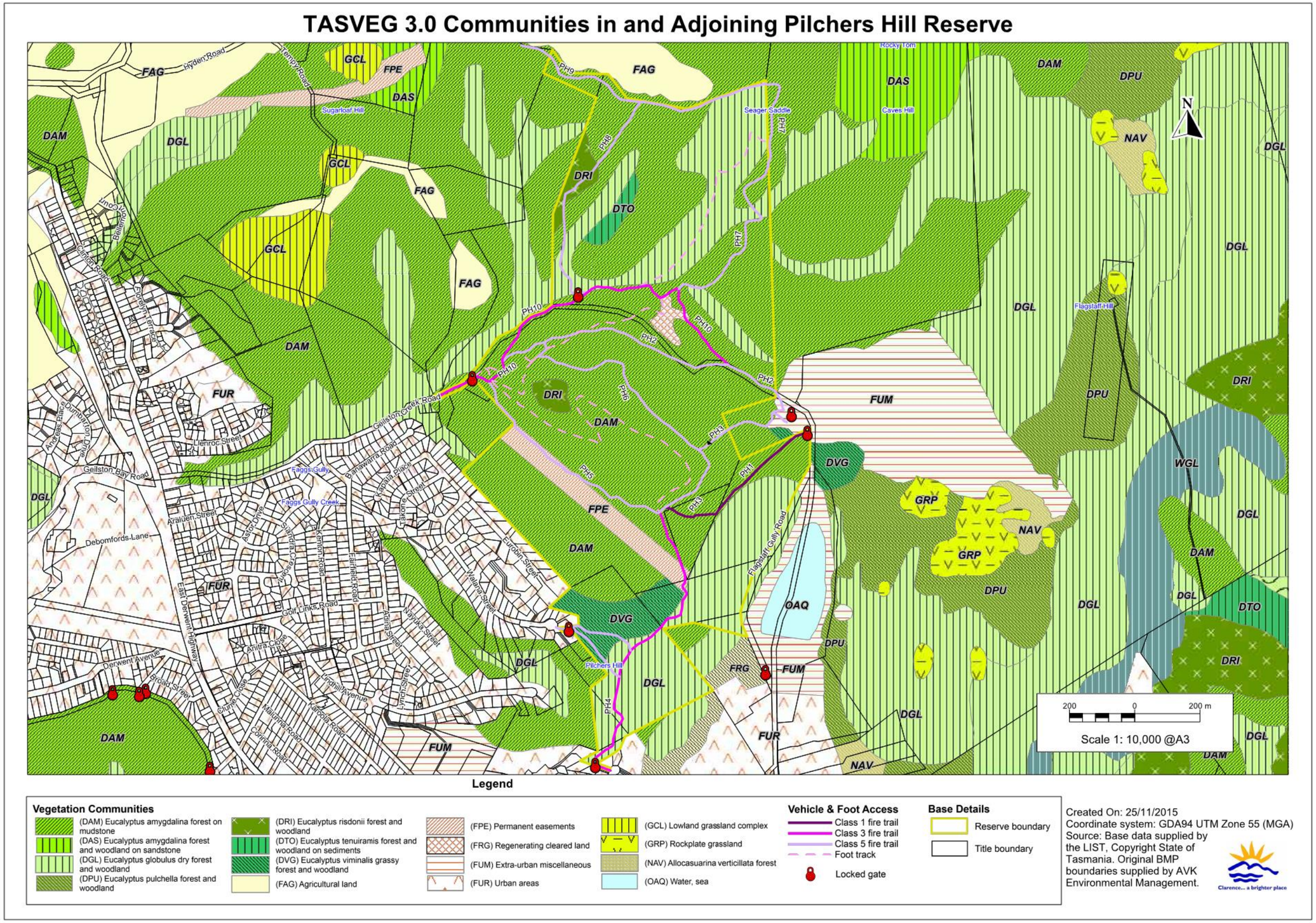


Figure 3 – Vegetation types in the reserve



1.3 Bushfire Management Objectives

Bushfire management within the Pilchers Hill 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 5.1.

1.4 Reserve Management Responsibilities

Management of the park is the responsibility of Clarence City Council. 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 TFS is responsible for suppressing bushfires within the park.

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 and Causes

The bushfire history of Pilchers Hill Reserve (1980-2015) is shown on figure 4.

2.1.1 Bushfires

Data from the TFS, Clarence City Council Fire and Bushland Management, Strategic Fire Management Plan for the Meehan Range Region (AVKEM, 2007) and The Middle Meehan Range Management Plan (Sinclair Knight Mertz, 1997) all document frequent historical fires in and surrounding the reserve from bushfire and planned fuel reduction burning.

Most of the bushland surrounding the reserve was impacted by bushfire in the 1980s. The Middle Meehan Range Management Plan (Sinclair Knight Mertz, 1997) mentions a major bushfire in the area in 1990 but the area burnt by this bushfire has not been recorded.

The last major bushfire to impact the reserve was in October 2006. This bushfire burnt all the reserve except some southern sections of the reserve where planned fuel reduction burning had taken place in March 2006 prior to the bushfire. The section of the reserve between the power line easement and Faggs Gully Creek was burnt at high intensity during this bushfire.

Data supplied by the TFS and Clarence City Council Fire and Bushland Management showed that within the duration of the previous BMP, the TFS attended two incidents within in the reserve (see figure 4).

The first incident being a passenger vehicle fire in July 2013. Cause determined as malicious. The second incident was a grassfire <1^{ha} adjacent to the water reservoir on TasWaters land. The cause was undetermined.

2.1.2 Planned Fires

The planned burn history of Pilchers Hill Reserve (1984-2015) is shown on figure 5.

During the previous BMP one planned burn was conducted by Council's Fire and Bushland Management within the reserve in VMU 1.

Table 8 shows the 2016-2021 planned burning schedule for the reserve.

Clarence City Council Fire and Bushland Management undertook a planned fuel reduction burn in VMU 2 during 2006. This strategic burn played a key part in the following 2006 bushfire that impacted the majority of the reserve. The previously burnt VMU was the only section of the bushfire that was controllable.

Figure 4 – Bushfire history (1980-2015)

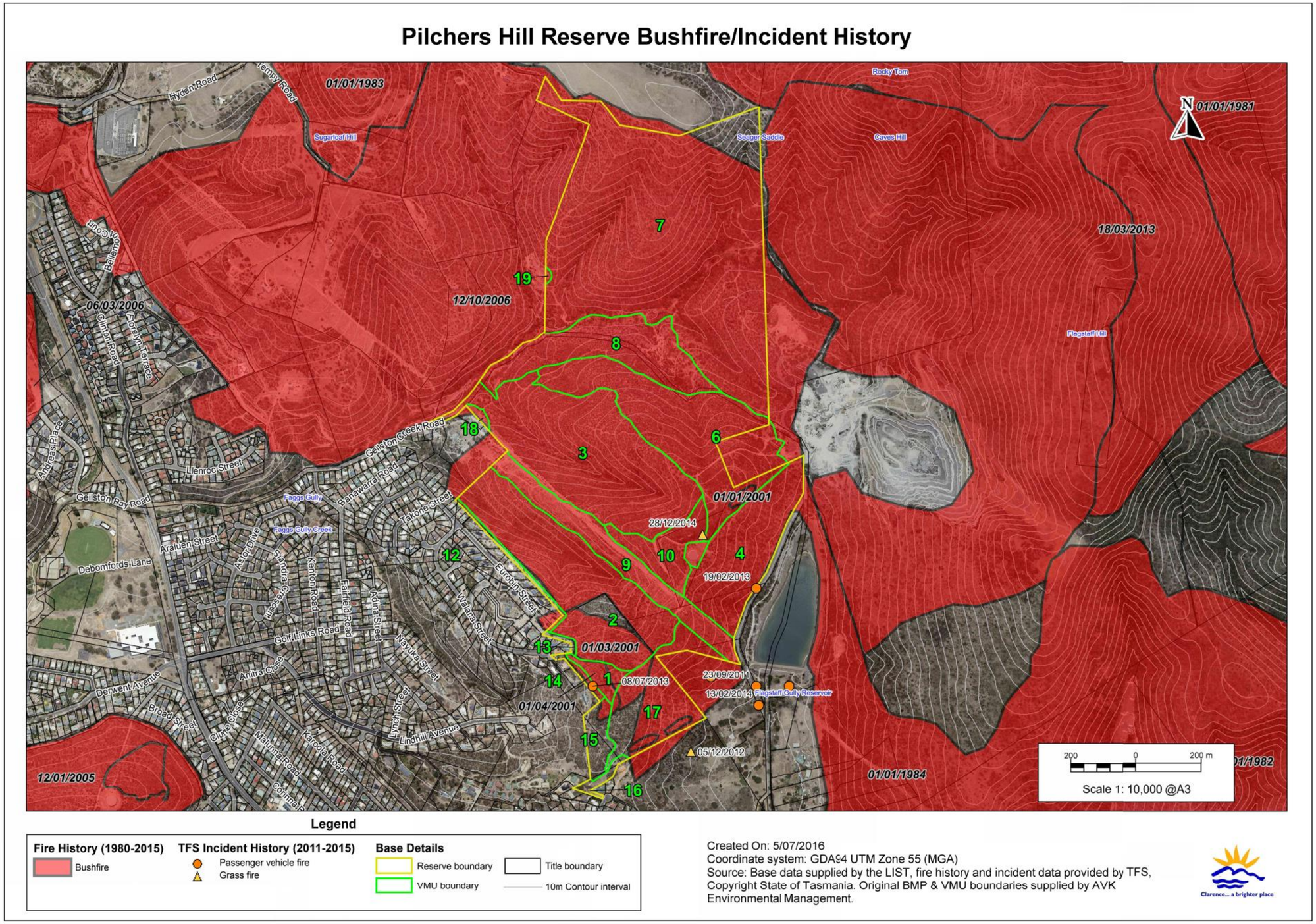
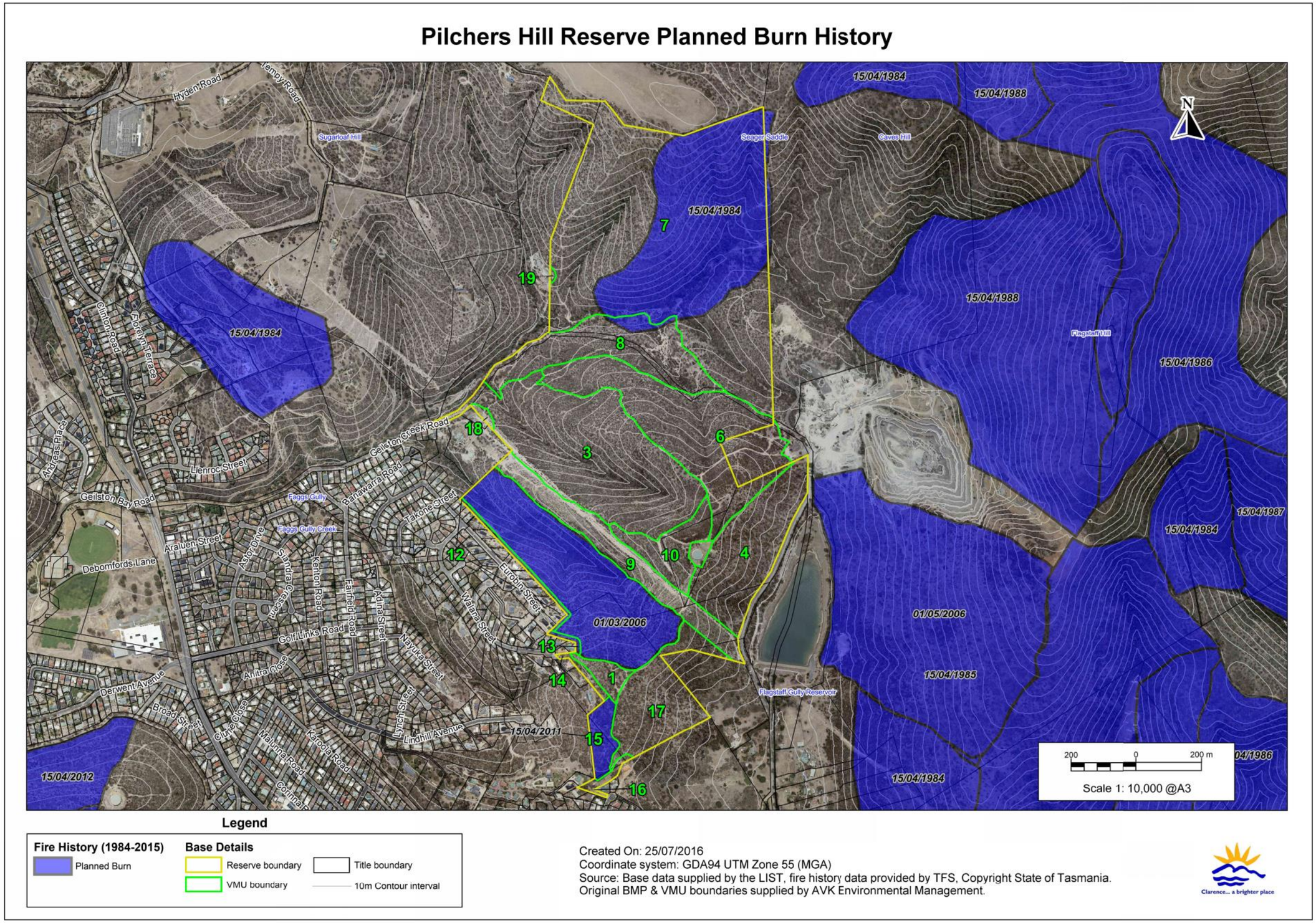


Figure 5 – Planned burning history (1984-2015)



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 bushfire. Very high intensity (> 4000 kW/m heat output at the bushfire 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 0.5 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) 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 Pilchers Hill Reserve are given in table 1. The TASVEG 3.0 codes of the vegetation types in figure 3 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 DAM DVG DGL DTO DRI	Canopy, near surface and surface fuel all present, bark fuels only present on roughed barked trees and shrubs. Moderate fuel loads, grass cover generally sparser and lower in height than in open grassland. Grass cover has some dense aggregates predominately *Lomandra* sp. Leaf and bark fall around 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.
Easements FPE	Surface, near surface and some elevated fuel present. Height of elevated fuels controlled by regular cutting. Low to moderate fuel loads with a relatively high proportion of grass fuels.	Can generate rapidly moving, low to moderate intensity fires in late summer and early autumn. Fires can occur at other times of the year if cured grass and bracken is present. Bushfire intensity will generally depend on the length of time since the easement has been maintained. Easements are excluded from planned burning due to the risk of the power lines arcing out.

Fuel loading within the reserve following the 2006 bushfire is between <5-10$^{t/ha}$. Average fuel loadings within the reserve are 5-7$^{t/ha}$.

A large component of fuel loading within the reserve is dead elevated fuels post 2006 bushfire. As time lengthens, these fuels will contribute to the near surface fuel layer. Removal of these can assist with fire hazard reduction, but also have an adverse effect contributing to soil loss given the moderate to highly erodible soil types within the reserve.

2.3 Bushfire Threat and Risk to Persons

The main bushfire threat to the reserve is considered to come from fires moving into the reserve from the north, as occurred in the October 2006 bushfire or the Downhams Road bushfire in March 2013. Similarly bushfires starting along Faggs Gully Creek, as fire starting here would have an upslope run through much of the reserve. Control of such bushfires in moderate or high fuel loads on days of very high or greater fire dangers would be difficult and dangerous.

Given the size of the reserve and its extensive tracks and fire trail network, the threat to persons caught in the reserve during a bushfire could be at great risk as there are few cleared areas that could be used as a refuge, apart for the quarry. The 2006 and 2013 bushfire in and adjacent to the reserve showed that fires moving upslope through the reserve can burn at high intensity.

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 6.

2.4.1 Bushfire Risk to Natural Heritage Assets

The conservation value of the plant communities in the Pilchers Hill Reserve is given in table 2. A number of plant species of conservation value occur within the reserve (see figure 6). These are listed in table 3 along with their response to bushfire if known.

The *Natural Values Atlas* identifies no verified records of fauna species of conservation significance occurring within the reserve. It does identify potential habitat present within the reserve for the following species:

Wedge-tailed eagle (*Aquila audax)*, Tasmanian wedge-tailed eagle *(Aquila audax* Subsp. *Fleayi),* white-bellied sea eagle *(Haliaeetus leucogaster)*, 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)*, ammonite owl *(Discoharopa vigens)*, masked owl *(Tyto novaehollandiae)*, Australian grayling *(Prototroctes marena)*, forty-spotted paradalote *(Paradalotus quadragintus)* and grey goshawk *(Accipiter novaehollandiae).*

Figure 6 – Assets at risk from bushfire

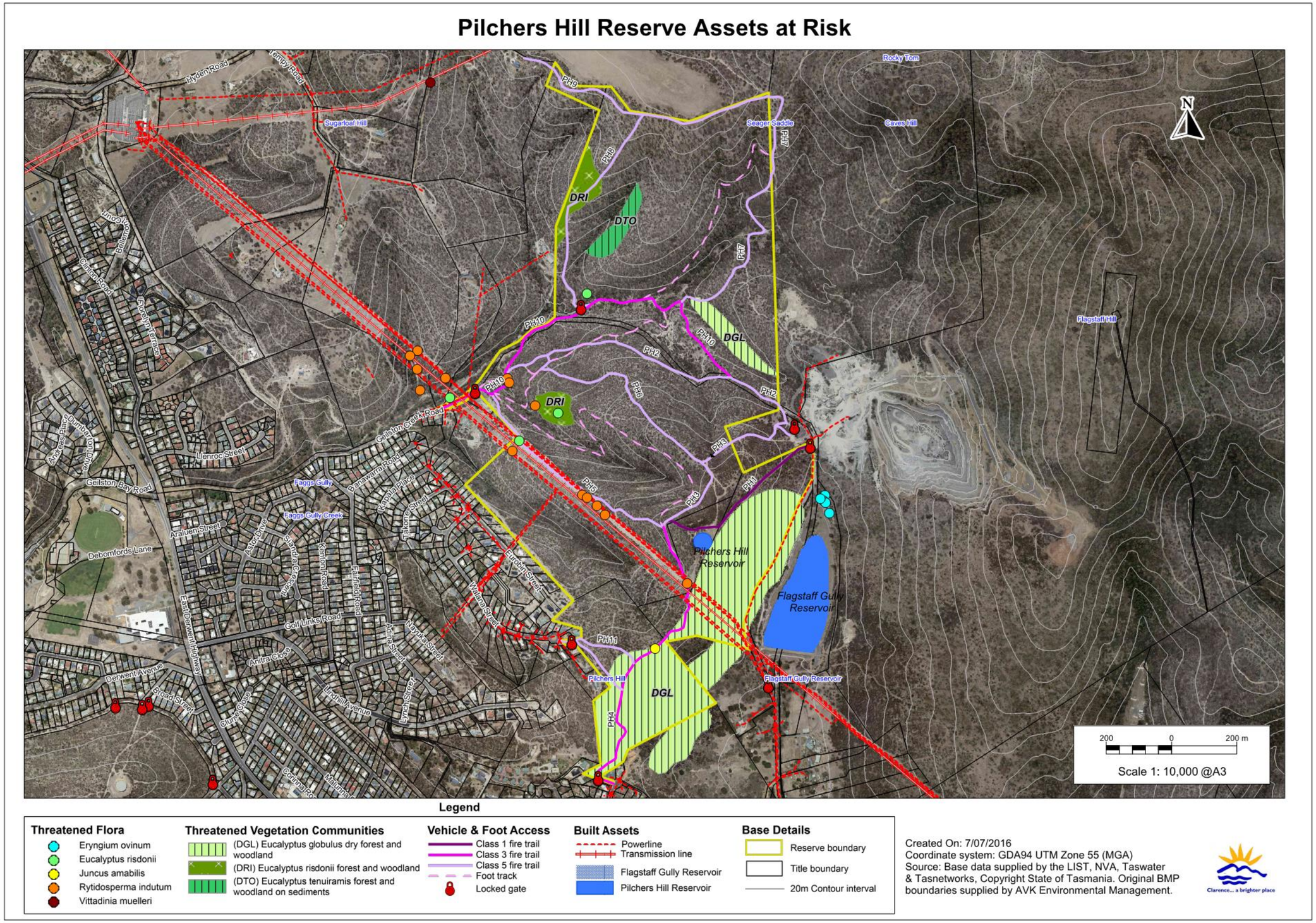


Table 2 – Conservation values of native plant communities

TASVEG 3.0 CODE	EQUIVALENT FLORISTIC COMMUNITY[1]	Conservation Status[2]
DAM	DRY-gAMmud Grassy *E. amygdalina* forest	Not threatened
DGL	DRY-gGLOB Grassy *E. globulus* forest	THREATENED NATIVE COMMUNITY
DRI	DRY-gRIS Grassy *E. risdonii* forest	THREATENED NATIVE COMMUNITY
DVG	DRY-gVIM Grassy *E viminalis* woodland	Not threatened
DTO	DRY-hTEN-mud Grassy E. tenuiramis forest	THREATENED NATIVE COMMUNITY

1. Forest Practices Authority (2005)

2. *Nature Conservation Act 2002*

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
Eucalyptus risdonii Risdon peppermint	RARE	Forms a localised stand on the west facing upper slope.	Regenerates from lignotubers. Repeated fires may weaken trees. Fire promotes seed release and subsequent germination.	Not threatened
Cynoglossum austral coast houndstongue	RARE	Recorded observations at entrance to fire trail PH 10 on Geilston Creek Road.	Response to fire currently unknown. Due to its widespread distribution and large number of populations and individuals resulting from new observations since the time of listing, this species is under consideration for delisting from schedules of the *Threatened Species Protection Act* 1995 in 2015.	Not threatened
Juncus amabilis gentle rush	RARE	Recorded from a low-lying hollow on the edge of the fire trail to Pilchers Hill from the south west corner of the reserve.	Likely to regenerate from rootstock and establish from seed following bushfires.	Not threatened
Lepidium pseudotasmanicum Shade peppercress	RARE	Recorded in 1996 near eastern entrance.	Regenerates, sometimes prolifically, from seed after bushfire.	Not threatened
Rytidosperma indutum Tall wallaby grass	RARE	Widespread throughout the open woodland vegetation on all aspects.	Likely to regenerate from rootstock and establish from seed after bushfire.	Not threatened

1. Forest Practices Authority (2005)
2. 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 4 – Fire attributes of the native vegetation

TASVEG 3.0 CODE	FIRE SENSITIVITY	FLAMMABILITY
DAM	Low	High
DGL	Low	High
DRI	Low	High
DTO	Low	High
DVG	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 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 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 bushfire 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 native bushland 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.

2.4.2 Bushfire and Habitat

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 at Pilchers Hill Reserve which adjoins extensive bushland on the Meehan Range.

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 as has happened in the past.

The bushfire management requirements of the different plant communities/habitats in the reserve are given in table 5. These plant communities have been grouped together according to their bushfire management requirements.

Table 5 - Bushfire management requirements of the plant communities in the reserve

TASVEG MAPPING UNITS	BUSHFIRE IMPACTS AND BUSHFIRE MANAGEMENT AIMS
Grassy dry sclerophyll forests and woodlands	
DAM – *Eucalyptus amygdalina* forest on mudstone DGL – *Eucalyptus globulus* dry forest and woodland DVG – *Eucalyptus viminalis* grassy forest and woodland DTO – *Eucalyptus tenuiramis* forest and woodland on sediments DRI - *Eucalyptus risdonii* 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. Overfrequent burning regimes in the past within 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 representative areas to provide controls for monitoring the effects of bushfire.** **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 are no known Aboriginal heritage sites within the park.

Infrastructure within the reserve includes a roofed water reservoir on top of Pilchers Hill (owned by TasWater), high and low voltage power lines, and metal boom gates. To the east and external of the reserve is Flagstaff Gully Reservoir (water supply dam owned by TasWater), this is filled with treated water piped to the site. Runoff from the dam catchment is diverted around the dam, except for flood flows which would enter the dam. Fires external to the dam have potential to contaminate this site through embers.

The main built assets at risk from bushfire are the buildings and infrastructure in the residential areas on the western side of the reserve, and the quarry adjoining the reserve in Flagstaff Gully. A number of residential areas to the west of the reserve are separated from the reserve by bushland on private property. These areas are also at risk from fires moving through the reserve, but protection measures need to go on the bushland in private ownership, rather than in the reserve. Planned fuel reduction burning in the reserve will contribute to the protection of these dwellings to the west of the reserve.

During 2014 Clarence City Councils Fire and Bushland Management established an outer zone on the Council land behind Eurobin Street. This meets the current TFS specifications for an outer zone as identified in the TFS document *Bushfire Survival Plan 2015-2016.* Additionally, this has been identified as a strategic FMZ under the Hobart Fire Protection Plan and maintained annually.

The degree of fire danger at any particular time is a combination of fine fuel quantity, slope, and the prevailing weather conditions. The actual risk of 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 bushfire 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 the 2006 bushfire showed that 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 6. This assessment process has been analysed and meets compliance with AS/NZS IOS:31000-2009. Note that the assessment in table 6 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 6 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 Tasmania Fire Service 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 6 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 6 - 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 FIRE RISKS	PROPOSED MANAGEMENT STRATEGIES
	A	B	C	D	E[1]	F	G	Level of Risk		
Dwellings bordering the reserve along Eurobin Street	3	3	1	2	2	2	6	432 Moderate		Maintain a minimum 15m 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 62, 64, 66 and 68 Walana Street	3	3	1	2	2	2	6	432 Moderate		Maintain a minimum 15m 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 63 and 65 Robin Court, and 71 Robin Court	3	2	3	2	2	1	6	432 Moderate		Maintain a minimum 20m 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 FIRE RISKS	PROPOSED MANAGEMENT STRATEGIES
	A	B	C	D	E[1]	F	G	Level of Risk		
Dwelling at No. 134 Geilston Creek Road	3	3	1	2	2	2	6	432 Moderate	This dwelling faces a much greater bushfire risk from bushland on private property to the west of the dwelling.	Maintain a minimum 15m wide outer zone along the reserve boundary adjoining this dwelling 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 dwelling.
Dwellings bordering the reserve at 73, 75 and 77 Walana Street	3	2	1	2	2	2	6	288 Moderate		Maintain the area between the fire trail and the reserve boundary adjoining these dwellings as an outer zone 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.
Building at No. 97 Geilston Creek Road	3	2	1	2	2	2	6	288 Moderate		Maintain a minimum 15m wide outer zone along the reserve boundary adjoining this dwelling 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 dwelling.
Power line to Hanson Quarry	3	1	3	2	2	1	4	144 Low	Power lines may be a source of ignitions.	TasNetworks to maintain existing cleared easement to minimise the risk of fires.
Dwelling bordering the reserve at 41 Sherwood Court	1.5	2	1	2	2	1	6	72 Low	This dwelling faces a much greater bushfire risk from bushland on private property to the north of the lot.	No protection measures required within the reserve. Advise residents of the need to maintain an adequate defendable space around their dwelling.
Buildings at Hanson Quarry	3	2	3	2	0.2	1	4	29 Low		Not on Council managed land. Quarry operators should maintain cleared areas around assets at risk.

ASSET AT RISK	RISK ANALYSIS (See section 5.4 of the Bushfire Management Strategy)								OTHER FIRE RISKS	PROPOSED MANAGEMENT STRATEGIES
	A	B	C	D	E[1]	F	G	Level of Risk		
Dwellings bordering the reserve at 53, 55 and 57 Robin Court	1.5	2	1	2	0.2	1	6	7 Low		Maintain adjoining arm of the reserve as an outer zone. Advise residents of the need to maintain an adequate defendable space around their dwellings.
Flagstaff Gully Reservoir (dam to east and external to the reserve)	3	1	3	1	0.2	1	4	7 Low	Water quality may be affected by ash from nearby fires and by increased sediment in storm runoff after fires.	No burning close to the dam. Consult TasWater in planning stages of any burning that may impact the dam.
Pilchers Hill Reservoir (roofed concrete tank)	3	3	3	0	2	1	2	0 Minimal	Water may be contaminated by smoke and ash from nearby bushfires.	No protection measures required. Consult TasWater in planning stages of any burns near the reservoir.
High voltage power lines	3	3	3	0	2	1	4	0 Minimal	Power lines may be a source of ignitions.	TasNetworks to maintain existing cleared easement to minimise the risk of fires.

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 Pilchers Hill Reserve, a review of the success of the implementation of the recommendations of the previous BMP was carried out. The review found that of seventeen recommendations eleven have been fully implemented and five have been partly implemented. One recommendation was not applicable as no bushfires impacted the reserve during the 5 year period of the previous BMP. The full findings of the review are in Appendix A.

3.1.2 Planned Burning

During the 5 year period covered by the previous BMP Clarence City Council had two planned burns scheduled. One was successfully carried out in April 2013 in VMU 1. The second planned burn is scheduled for autumn 2016 in VMU 7. Figure 5 shows the planned burning history of the reserve and adjacent land from 1984-2015. Table 8 shows the 2016-2021 planned burn schedule for the reserve.

As significant stakeholders Pioneer Concrete Tas Pty Ltd (adjacent quarry), Parks and Wildlife Service Tasmania, TasNetworks or TasWater must be engaged as stated in table 8 during the planning stages of fuel reduction burns within the reserve.

3.1.3 Vehicle Access Routes and Foot Tracks

The reserve has seven access points. Five have Council boom gates preventing access; one enters through private property preventing public access, the other from bushland on private property in the north-eastern corner of the reserve without a boom gate. This access point is the main entry point for illegal vehicles usage within the reserve. Installing a boom gate at this location is not viable due to the remote location, combined with vehicles previously cutting new tracks around gates in the area on private property. The illegal vehicle usage through this point is minimal and monitored regularly. Walana Street access is for 4wd vehicles only (class 5 tankers).

Access points to the reserve are shown in figure 7 and maintained regularly.

The reserve has an extensive fire trail and foot track network throughout that provides adequate access to all areas for fire management. These are used as fire control lines for the planned burning recommended in this plan. This network was re-evaluated in 2015 and the most suitable fire trail network has been formalised within this review.

During 2015, PH 8 and PH 9 were re-established in preparation for the scheduled burn in VMU 7 planned for 2016.

Locations of fire trails and walking tracks within the park are shown in figure 7 and described in table 7. 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 PH1, PH2, PH3, PH4, PH5, PH6, PH7, PH8, PH9, PH10 and PH11 were identified under the Hobart Fire Protection Plan as strategic fire trials.

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).

3.1.4 Water Supply

There are four fire hydrants on water pipelines running through the reserve in the vicinity of Robin Court, Walana Street and the easement (figure 7). Water for firefighting and fire management can also be obtained from fire hydrants in the streets surrounding the reserve and from the quarry. Water for firefighting cannot be taken from the Flagstaff Gully Reservoir, as this is treated drinking water.

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 fire fighters 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. However, the large electricity transmission line easement that runs through the reserve would function as a partial fuel break though it is not maintained for this purpose.

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 Building 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 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.

3.1.6 Bushfire Detection and Suppression

Pilchers Hill Reserve is highly visible from suburbs to the west and it is likely that any fires would be promptly reported.

The steep slopes in most parts of the reserve will make bushfire control very difficult if fires are moving upslope in relatively high fuel loads. This occurred during the 2006 bushfire within the reserve and the 2013 Downhams Road fire adjacent to the reserve.

Figure 7 – Vehicle and foot access

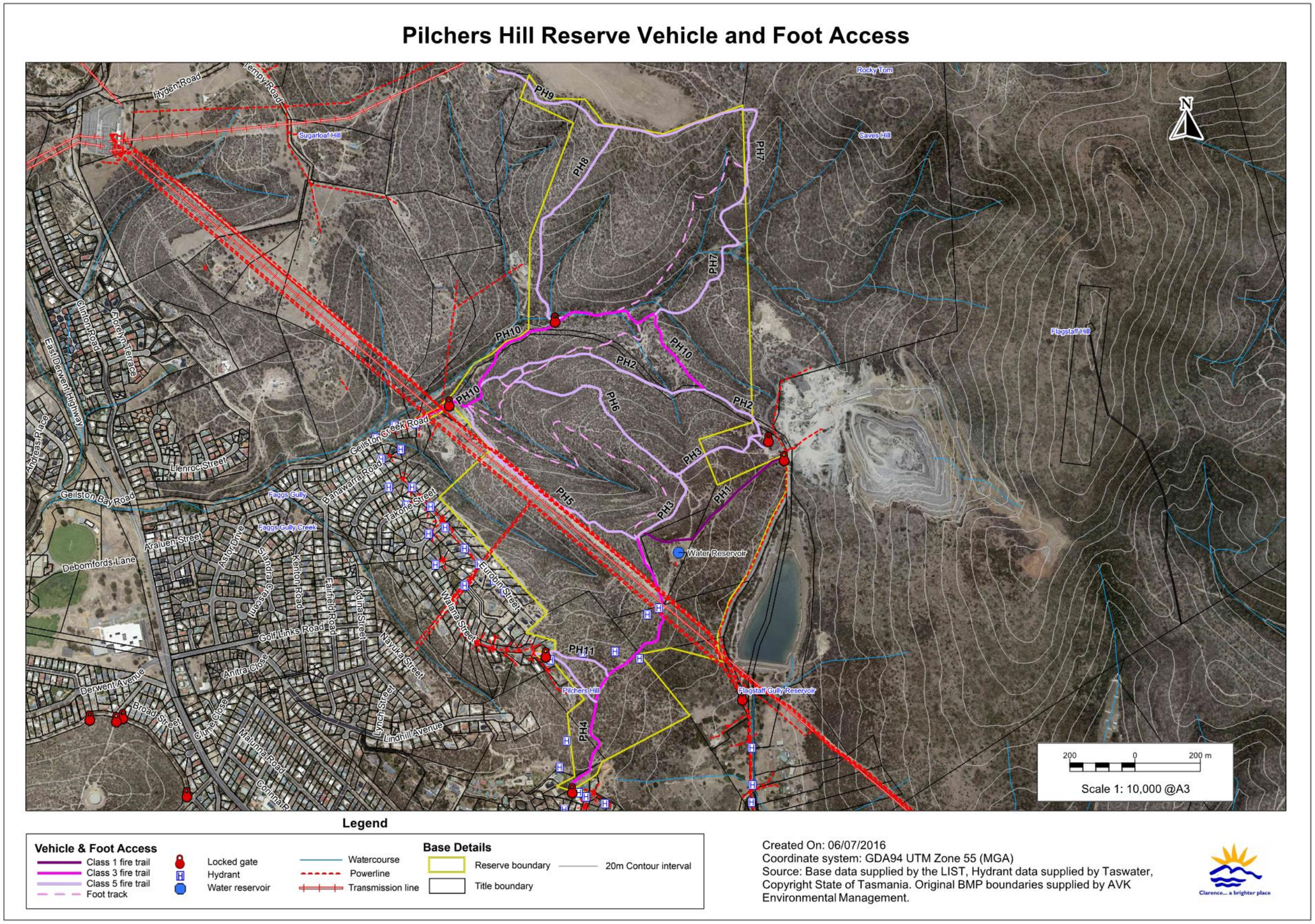


Table 7 - Condition and maintenance of fire trails

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

Note: Pilchers Hill Reserve fire trail identities and locations have altered since previous BMP. ALL PRE 2016 FIRE TRAIL DATA FOR PILCHERS HILL RESERVE IS NOW OBSOLETE.

FIRE TRAIL ID	USAGE CLASS	STRATEGIC FIRE TRAIL UNDER HOBART FIRE PROTECTION PLAN[1]	MAINTENANCE PRIORITY	LOCATION AND CONDITION AT FEBRUARY 2016	ACTION REQUIRED	MANAGEMENT CONSTRAINT
PH1	1/5	YES	High	Starts opposite Hanson Quarry entrance (large mesh gates), finishes at junction (JCN) PH1/PH3. Section from reservoir to JCN PH1/PH3 is class 5. Currently meets class 1 & class 5 standards.	Clear encroaching vegetation as required. Inspection and maintenance as specified in MP2.	No
PH2	5	YES	High	Starts at JCN PH2/PH3 (418 Flagstaff Gully Rd - opposite Hanson Quarry entrance, not PH1 entrance), finishes at JCN PH2/PH10 (western end). Currently meets class 5 standards.	Clear encroaching vegetation as required. Inspection and maintenance as specified in MP2.	No

FIRE TRAIL ID	USAGE CLASS	STRATEGIC FIRE TRAIL UNDER HOBART FIRE PROTECTION PLAN[1]	MAINTENANCE PRIORITY	LOCATION AND CONDITION AT FEBRUARY 2016	ACTION REQUIRED	MANAGEMENT CONSTRAINT
PH3	5	YES	High	Starts at locked boom gate at 418 Flagstaff Gully Rd (opposite Hanson Quarry entrance, not PH1 entrance), finishes at JCN PH3/PH4/PH5. Currently meets class 5 standards.	Clear encroaching vegetation as required. Remove over hanging dead branches. Inspection and maintenance as specified in MP2.	No
PH4	3	YES	High	Starts at 61 Robin Court, finishes at JCN PH3/PH4/PH5. Sight lines restricted in section 50m south of easement, currently meets class 5 standards.	Widen section and remove stumps 50m south of easement. Clear encroaching vegetation as required. Inspection and maintenance as specified in MP2.	Rare flora *Juncus amabilis*[2] and *Rytidosperma indutum*[2] within proximity. Preferably undertake maintenance in Autumn when not in seed setting period. May require permit from DPIPWE Threatened Species Section.

FIRE TRAIL ID	USAGE CLASS	STRATEGIC FIRE TRAIL UNDER HOBART FIRE PROTECTION PLAN[1]	MAINTENANCE PRIORITY	LOCATION AND CONDITION AT FEBRUARY 2016	ACTION REQUIRED	MANAGEMENT CONSTRAINT
PH5	5	YES	High	Starts at JCN PH3/PH4/PH5 following transmission lines, finishes at JCN PH5/PH10 (western end). Some minor drainage maintenance work required. Currently meets class 5 standards.	Re-grip eastern section of fire trail as required. Clear encroaching vegetation as required. Inspection and maintenance as specified in MP2.	Rare flora *Eucalyptus risdonii*[2] and *Rytidosperma indutum*[2] within proximity. Preferably undertake maintenance in Autumn when not in seed setting period. May require permit from DPIPWE Threatened Species Section.
PH6	5	YES	High	Starts at JCN PH3/PH6, finishes at JCN PH6/PH2. Drainage grips require maintenance. Currently meets class 5 standards.	Clear encroaching vegetation as required. Clean out drainage grips as required. Inspection and maintenance as specified in MP2.	No
PH7	5	YES	High	Starts at JCN PH7/PH10, finishes at JCN PH7/PH8. Has some steep rocky sections, can become slippery after rain. Currently meets class 5 standards.	Inspection and maintenance as specified in MP2.	No

FIRE TRAIL ID	USAGE CLASS	STRATEGIC FIRE TRAIL UNDER HOBART FIRE PROTECTION PLAN[1]	MAINTENANCE PRIORITY	LOCATION AND CONDITION AT FEBRUARY 2016	ACTION REQUIRED	MANAGEMENT CONSTRAINT
PH8	5	YES	High	Starts at JCN PH7/PH8, finishes at locked slip rail PH10/PH8. Has steep rocky sections, can become slippery after rain. Section at slip rail can become boggy after rain. DO NOT DRIVE AFTER RAIN.	Northern section requires regular inspection after rain due to moderate to highly erodible soils and slope. Inspection and maintenance as specified in MP2.	Large sub surface rock in sections, steep slope, cross fall and moderate to highly erodible soils.
PH9	5	YES	High	Starts on 115 Tempy Rd, Geilston Bay (private property), finishes JCN PH9/PH8.	Inspection and maintenance as specified in MP2.	Engage with resident 115 Tempy Road, Geilston Bay prior to works. Section on private property. Large sub surface rock in section of fire trail.

FIRE TRAIL ID	USAGE CLASS	STRATEGIC FIRE TRAIL UNDER HOBART FIRE PROTECTION PLAN[1]	MAINTENANCE PRIORITY	LOCATION AND CONDITION AT FEBRUARY 2016	ACTION REQUIRED	MANAGEMENT CONSTRAINT
PH10	3	YES	High	Starts opposite 85 Geilston Creek Rd, Geilston Bay following Faggs Gully Creek, finishes at JCN PH10/PH2.	Inspection and maintenance as specified in MP2.	Rare flora *Cynoglossum austral*[2], *Eucalyptus risdonii*[2] and *Rytidosperma indutum*[2] within proximity. Preferably undertake maintenance in Autumn when not in seed setting period. May require permit from DPIPWE Threatened Species Section.
PH11	5	YES	High	Starts at locked boom gate between 70 and 77 Walana Street, Geilston Bay. Runs as a wishbone shaped circuit track, finishing at JCN PH4. 4wd access only from Walana Street.	Inspection and maintenance as specified in MP2.	No

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.

3.2 Weeds

Environmental weeds occur throughout the park (see figure 8).

Seven weed species were observed in the reserve during field work that is 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.

Boneseed (*Chrysanthemoides monilifera*), English broom (*Cytisus scoparius*) and gorse *(Ulex europaeus)* are present declared weeds and WONS.

Declared weeds in the reserve that are not listed in WONS include: pampas *(Cortaderia selloana),* Spanish heath (*Erica lusitanica*), horehound (*Marrubium vulgare*) and serrated tussock *(Nassella trichotoma)*.

The other environmental weeds observed within the park were bracken *(Pteridium esculentum)* and assorted garden escapees from previously dumped fill in VMUs adjacent to the quarry.

A detailed weed survey was not undertaken as part of this BMP, merely field observations. A detailed weed survey was conducted in 2013 by Tasflora as part of the RAP; this data is shown in figure 8.

Throughout the duration of the previous two BMPs significant weed management occurred in VMU 4, VMU 6, VMU 7, VMU 8 and VMU 17. Extensive follow up weed management is now an inaugural part in the management regimes for these areas.

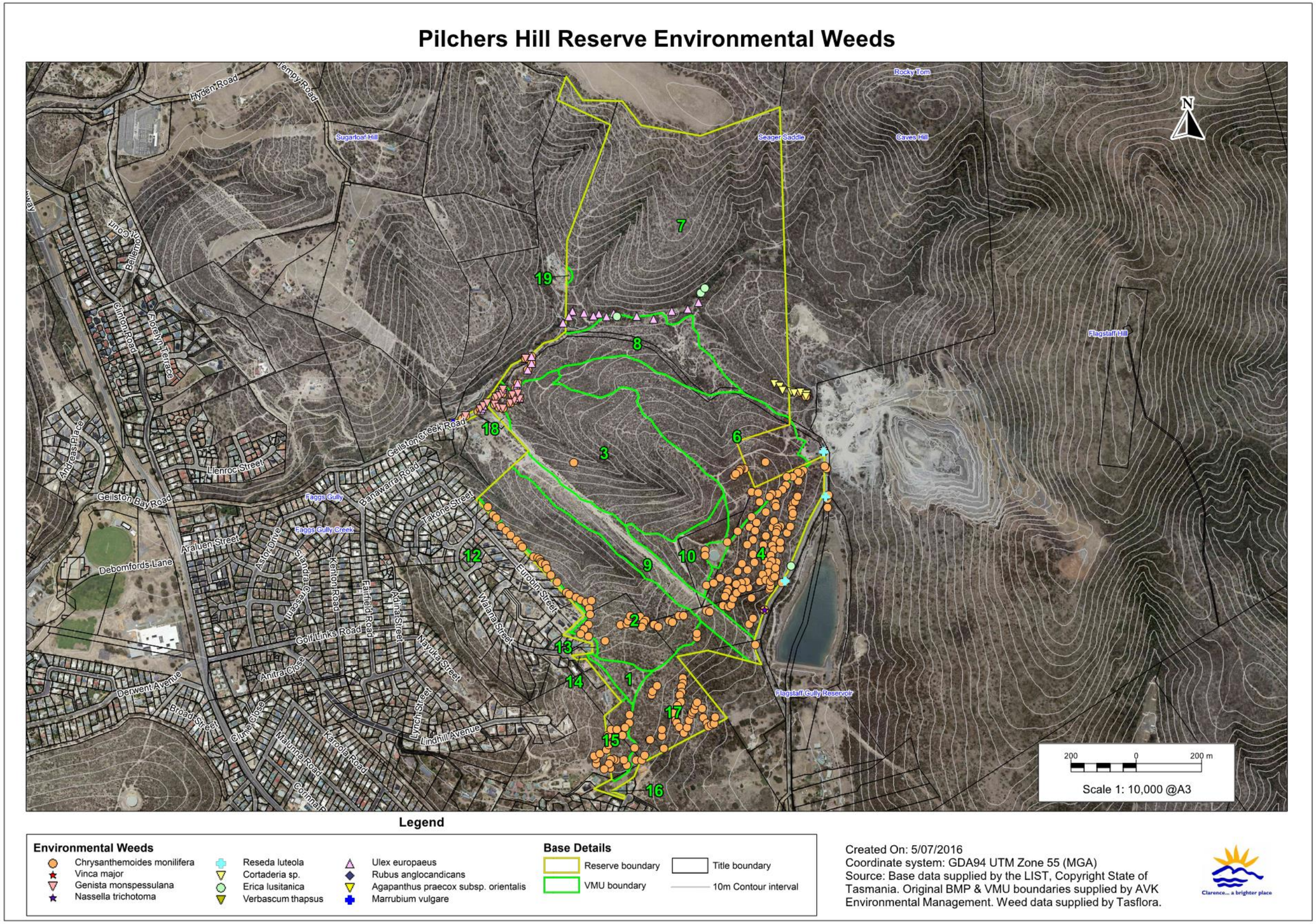
VMU 4, VMU 8 and VMU 17 are the most heavily weed populated VMUs within the reserve. VMU 4 has significant gorse *(Ulex europaeus)* infestation which is being treated by chemical application in conjunction with removal and burning.

VMU 8 and 17 have dense boneseed (*Chrysanthemoides monilifera*) infestations. This is being managed by hand weeding in conjunction with cut and pasting and burning residue on site outside the seed setting period. Given the dense aggregates and adjacent populations on private property complete removal is not viable, the management regime adopted in this and future BMPs is reducing the rate of spread into adjacent VMUs.

Weed control activities have been integrated with the planned burning program in VMU 1 and VMU 7 during the previous BMP as outlined in MP 8 in *Clarence City Council Bushfire Management Strategy - Best Management Practice Guidelines*.

Regeneration of weeds in the reserve is likely to continue for many years due to the existing seed bank in the soil in some VMUs and the fact that some weed species have an inherent ability to resprout following primary weed control. Planned burns or bushfires are also likely to encourage germination on new weeds. Weed control activities will not be successful unless a commitment is made to undertaking ongoing follow-up maintenance activities (Tasflora, 2013).

Figure 8 – Environmental weeds in reserve



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 into the revised plan 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 Saturday 28 November 2015 and was attended by two community members and a Council representative. No 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 Council's response.

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 issued to the TFS.

4.1 Bushfire Risk Reduction Strategy

The overall bushfire risk reduction strategy recommended for the Pilchers Hill 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 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 within and adjoining the reserve.
- Carry out strategic planned fuel reduction 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 not implemented during the previous BMP, and has a heavy influence 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.

The approach adopted in this plan is to use planned burning both for asset protection in areas targeted for maximum risk reduction and for habitat management. Areas burnt for habitat management will have the additional benefit of reduced bushfire hazard for a period following each bushfire. The 2016-2021 planned burning schedule for Pilchers Hill reserve is shown in table 8.

As significant stakeholders Pioneer Concrete Tas Pty Ltd (adjacent quarry), Parks and Wildlife Service Tasmania, TasNetworks and TasWater must be engaged as stated in table 8 during the planning stages of fuel reduction burns within the reserve.

4.3.1 Vegetation Management Units (VMU)

The planned burning program in this plan is based on the division of the dry forest and woodland habitats into a mosaic of vegetation management units (VMUs) (see figure 9). 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 5.

The previous BMP divided the reserve into nineteen VMUs based on the vegetation types within the reserve, and the presence of suitable control lines in the form of fire trails and foot tracks.

This has been reduced to seventeen as VMU 5 and VMU 11 have been removed during the review process. Both VMUs are on land which is not under the control of Clarence City Council.

4.3.2 Planned Fire Regimes

The approach adopted in this plan is to use planned burning for a combination of asset protection in areas targeted for maximum risk reduction 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 areas 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 five-year period, after which another review is recommended. Burns within the reserve have been scheduled in table 8. 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 8, 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 two years of adjoining VMUs.

Figure 9 – Vegetation management units in the reserve

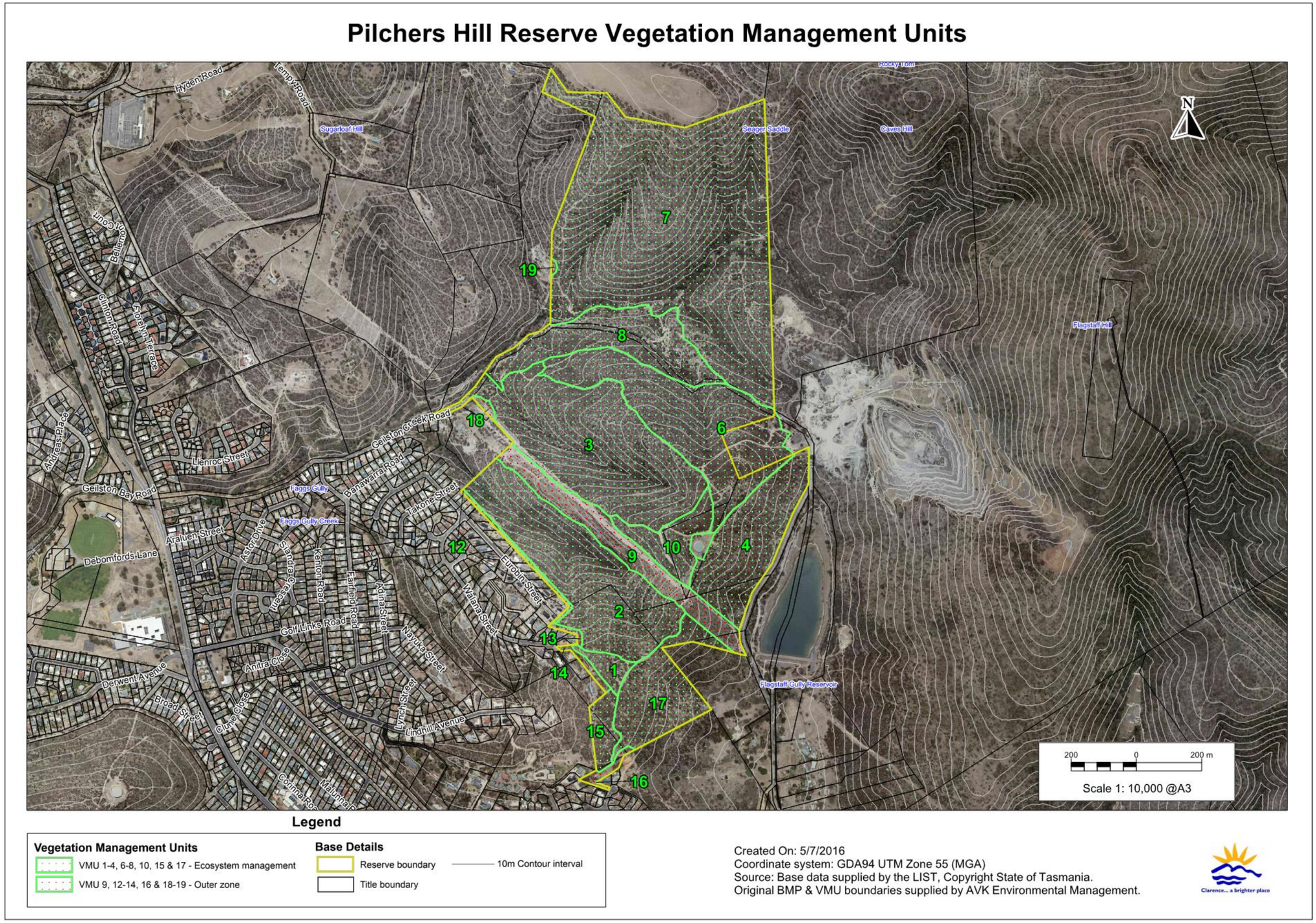


Table 8 – Bushfire management in the reserve

VMU[1]	AREA (ha)	BUSHFIRE MANAGEMENT OBJECTIVES and PRESCRIPTIONS	NOTES and PRECAUTIONS [2, 3, 4, 5]	LAST BURNT	NEXT BURN
1 DVG DGL	1.0	OBJECTIVES: Maintain the structure and floristics of the vegetation communities. Maintain groundcover to minimise erosion. Allow recruitment of canopy species. Reduce the extent and density of weeds. PRESCRIPTION: Autumn burn every 5 to 20 years.	Consult DPIPWE Threatened Species Section before burning. Contains DGL[2] Protect adjoining property during burns. Do not burn during the bird nesting/seed setting period.	2013	Assess next plan
2 DAM DVG	15.2	OBJECTIVES: Maintain the structure and floristics of the vegetation communities. Maintain groundcover to minimise erosion. Allow recruitment of canopy species. Reduce the extent and density of weeds. PRESCRIPTION: Autumn burn every 10 to 20 years.	Contains the rare plant species *Eucalyptus risdonii* [4], *Juncus amabilis* [4] and *Lepidium pseudotasmanicum* [4]. Obtain a permit from DPIPWE Threatened Species Section before burning. Contact TasWater in planning stage to avoid contamination of Flagstaff Gully Reservoir. Contact Pioneer Concrete Tas Pty Ltd (adjacent quarry) in planning stage. Power line easement along north-eastern boundary. Contact TasNetworks in planning stage. Protect adjoining property during burns. Do not burn during the bird nesting/seed setting period.	2006	Assess next plan

VMU[1]	AREA (ha)	BUSHFIRE MANAGEMENT OBJECTIVES and PRESCRIPTIONS	NOTES and PRECAUTIONS [2, 3, 4, 5]	LAST BURNT	NEXT BURN
3 DAM DRI	19.1	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: Burnt at high intensity in 2006, exclude from burning during this plan.	Contains the rare plant species *Eucalyptus risdonii* [4] and *Rytidosperma indutum* [4]. Obtain a permit from DPIPWE Threatened Species Section before burning. Consult DPIPWE Threatened Species Section before burning. Contains DRI[2] Contact TasWater in planning stages to avoid contamination of Flagstaff Gully Reservoir. Contact Pioneer Concrete Tas Pty Ltd (adjacent quarry) in planning stages. Power line easement along north-southern boundary. Contact TasNetworks in planning stage. Protect adjoining property during burns. Do not burn during the bird nesting/seed setting period.	2006	Assess next plan
4 DGL DAM	8.5	OBJECTIVES: Maintain the structure and floristics of the vegetation communities. Maintain groundcover to minimise erosion. Allow recruitment of canopy species. Reduce the extent and density of weeds. PRESCRIPTION: Autumn burn every 10 to 20 years.	Contains the rare plant species *Lepidium pseudotasmanicum* [4]. Obtain a permit from DPIPWE Threatened Species Section before burning. Consult DPIPWE Threatened Species Section before burning. Contains DGL[2] Power line easement along southern boundary. Contact TasNetworks in planning stage. Contact Pioneer Concrete Tas Pty Ltd (adjacent quarry) in planning stage. Contact TasWater in planning stage to avoid contamination of Flagstaff Gully Reservoir/damage to Pilchers Hill Reservoir. Do not burn during the bird nesting/seed setting period.	2006	Assess next plan

VMU[1]	AREA (ha)	BUSHFIRE MANAGEMENT OBJECTIVES and PRESCRIPTIONS	NOTES and PRECAUTIONS [2, 3, 4, 5]	LAST BURNT	NEXT BURN
6 DAM	15	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: Burnt at high intensity in 2006, exclude from burning during this plan.	Contact TasWater in planning stage to avoid contamination of Flagstaff Gully Reservoir/damage to Pilchers Hill Reservoir. 0.2ha of VMU owned by TasWater. Do not burn during the bird nesting/seed setting period. 2.4ha owned by Pioneer Concrete Tas Pty Ltd. Contact in planning stages.	2006	Assess next plan
7 DAM DGL DTO DRI	45	OBJECTIVES: Maintain the structure and floristics of the vegetation communities. Maintain groundcover to minimise erosion. Allow recruitment of canopy species. Reduce the extent and density of weeds. PRESCRIPTION: Autumn burn every 10 to 20 years.	Contains the rare plant species *Eucalyptus risdonii* [4]. Obtain a permit from DPIPWE Threatened Species Section before burning. Consult DPIPWE Threatened Species Section before burning. Contains DGL[2], DTO2 and DRI[2]. Contact PWS in planning stages. Contact TasWater in planning stages to avoid contamination of Flagstaff Gully Reservoir. Contact Pioneer Concrete Tas Pty Ltd (adjacent quarry) in planning stages. Protect adjoining property during burns. Do not burn during the bird nesting/seed setting period.	2006	2016
8 DAM FRG	8.6	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: Burnt at high intensity in 2006, exclude from burning during this plan.	Rare plant species *Eucalyptus risdonii* [4] and *Rytidosperma indutum* [4] in close proximity to VMU. Obtain a permit from DPIPWE Threatened Species Section before burning. Contact TasWater in planning stages to avoid contamination of Flagstaff Gully Reservoir. Contact Pioneer Concrete Tas Pty Ltd (adjacent quarry) in planning stages. Protect regeneration planting in the old quarry during burns. Do not burn during the bird nesting/seed setting period.	2006	Assess next plan

VMU[1]	AREA (ha)	BUSHFIRE MANAGEMENT OBJECTIVES and PRESCRIPTIONS	NOTES and PRECAUTIONS [2, 3, 4, 5]	LAST BURNT	NEXT BURN
9 FPE	6.0	OBJECTIVE: Protect electricity transmission lines. PRESCRIPTION: Maintain as an easement to TasNetworks specifications.	Easement is maintained by TasNetworks. Contains the rare plant species *Eucalyptus risdonii* [4], *Lepidium pseudotasmanicum* [4] and *Rytidosperma indutum* [4]. Obtain a permit from DPIPWE Threatened Species Section before undertaking any management activities likely to affect these species.	2006	No burning
10 DAM	3.3	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: Burnt at high intensity in 2006, exclude from burning during this plan.	Contains the rare plant species *Lepidium pseudotasmanicum* [4]. Obtain a permit from DPIPWE Threatened Species Section before burning. Contact TasWater in planning stage to avoid contamination of Flagstaff Gully Reservoir/damage to Pilchers Hill Reservoir. 1.6ha of VMU owned by TasWater. Contact Pioneer Concrete Tas Pty Ltd (adjacent quarry) in planning stages. Do not burn during the bird nesting/seed setting period.	2006	Assess next plan
12 DAM	0.5	OBJECTIVE: Maintain as a 10m wide outer zone to protect adjoining dwellings. PRESCRIPTION: See specifications for outer zone in MP 5 in the Best Management Practices Guidelines.		2006	Heap burn only
13 DVG	0.2	OBJECTIVE: Maintain as a 15m wide outer zone to protect adjoining dwellings. PRESCRIPTION: See specifications outer zone in MP 5 in the Best Management Practices Guidelines.		2006	Heap burn only
14 DVG DGL	0.4	OBJECTIVE: Maintain as an outer zone to protect adjoining dwellings. PRESCRIPTION: See specifications for outer zone in MP 5 in the Best Management Practices Guidelines.	Consult DPIPWE Threatened Species Section before burning. Contains DGL[2].	2001	Heap burn only

VMU[1]	AREA (ha)	BUSHFIRE MANAGEMENT OBJECTIVES and PRESCRIPTIONS	NOTES and PRECAUTIONS [2, 3, 4, 5]	LAST BURNT	NEXT BURN
15 DGL	1.5	OBJECTIVES: Maintain the structure and floristics of the vegetation communities. Maintain groundcover to minimise erosion. Allow recruitment of canopy species. Reduce the extent and density of weeds. PRESCRIPTION: Autumn burn every 10 to 20 years.	Contains the rare plant species *Lepidium pseudotasmanicum* [4]. Obtain a permit from DPIPWE Threatened Species Section before burning. Construct a control line along the reserve boundary or liaise with adjoining landowner to include bushland on the adjoining property. Protect adjoining property during burns. Do not burn during the bird nesting/seed setting period.	2011	Assess next plan
16 DGL	0.5	OBJECTIVE: Maintain as a 20m outer zone to protect adjoining dwellings. PRESCRIPTION: See specifications for outer zone in MP 5 in the Best Management Practices Guidelines.		Not known	Heap burn only
17 DGL	6.5	OBJECTIVES: Maintain the structure and floristics of the vegetation communities. Maintain groundcover to minimise erosion. Allow recruitment of canopy species. Reduce the extent and density of weeds. PRESCRIPTION: Autumn burn every 10 to 20 years.	Contains rare plant species *Lepidium pseudotasmanicum* [4] and *Juncus amabilis* [4]. Obtain a permit from DPIPWE Threatened Species Section before burning. Do not burn during the bird nesting/seed setting period. Expect dense *Chrysanthemoides monilifera* [5] post burn.	2006	Heap burn Winter 2018
18 DAM	0.2	OBJECTIVE: Maintain as outer zone to protect adjoining dwelling. PRESCRIPTION: See specifications for outer zone in MP 5 in the Best Management Practices Guidelines.		2006	Heap burn only
19 DAM	0.07	OBJECTIVE: Maintain as outer zone to protect adjoining dwelling. PRESCRIPTION: See specifications for outer zone in MP 5 in the Best Management Practices Guidelines.		2006	Heap burn only

Note: VMU 5 and VMU 11 have been removed during 2016 review as the land is not under Council control.

[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

[5] Declared weed and WONS

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 fuel reduction 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

In June 2013 Tasflora developed the *Pilchers Hill Bushland Reserve Activity Plan 2013-2018*. This document aims to ensure the reserve is sustainably managed and links directly to the BMP through the preservation and enhancement of its natural, cultural and social values.

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 management burning, and for minimising the risk of weed invasion following bushfires. These guidelines should ensure that fires in the park 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 park 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 inner zones and outer zones established around assets at risk
- on fuel breaks
- Within 2m of the edge of fire trails.

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 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 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 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.

5.1 Management Action Summary

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 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, park users and other interest groups. Reduction in rubbish dumping within the reserve and residents planting in Council managed outer zones. Reduction in the incidence of illegal fires on and around the park.
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 TasWater TasNetworks	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	Signs erected.
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 7.	2, 6	E – 2	Clarence City Council Fire and Bushland Management	Fire trail repair works listed in table 7 completed.

RECOMMENDED ACTION	OBJECTIVE (section 1.3)	PRIORITY	RESPONSIBILITY	PERFORMANCE INDICATORS
6) Ensure all fire trails shown on figure 7 are inspected and maintained in a trafficable condition at all times according to MP 2. Relocate existing fire trail signage to meet revised strategic fire trail network.	2, 4	ROU - A	Clarence City Council Fire and Bushland Management	Vehicle access routes inspected as required in MP 2, and maintained in a trafficable condition for fire service vehicles.
7) 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.
8) Upon request conduct a familiarisation tour of the reserve for local TFS brigades prior to the start of the fire permit period each year.	1, 2, 4	ROU - A	Clarence City Council Fire and Bushland Management Tasmania Fire Service	Local TFS brigades familiar with bushfire management assets in the reserve.
9) Carry out planned fuel reduction burning according to the schedule in table 8 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.
10) Treat any weeds in areas to be burnt under this BMP according to MP 8. Ensure follow-up weed work is carried out after planned burns and bushfires.	3, 5	REC – A/S	Clarence City Council	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 weeds and WONS managed, reduction in extent of other weeds.

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.	3	E	Clarence City Council Fire and Bushland Management DPIPWE Threatened Species Section	All planned burns carried out according to the requirements of rare flora and fauna. All required permits obtained before burns or other management activities likely to affect threatened species.
12) Avoid burning the whole of any population of a threatened or rare plant species in a single bushfire.	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 bushfire.
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	BMP revised every 5 years.
15) 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	Meetings held as recommended in MP9 and the outcomes recorded.

RECOMMENDED ACTION	OBJECTIVE (section 1.3)	PRIORITY	RESPONSIBILITY	PERFORMANCE INDICATORS
16) 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.
17) 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.

References

AVKEM (2007) *Strategic Fire Management Plan for the Meehan Range Region.* Report prepared for Clarence City Council, the Tasmania Fire Service and the Tasmania Parks and Wildlife Service by AVK Environmental Management.

Brereton R. (1997) *Management prescriptions for the swift parrot in production forests.* Report to Tasmanian RFA Environment and Heritage Technical Committee.

Cheney P. and Sullivan A. (2008) *Grassfires: fuel, weather and fire behaviour, second edition*. CSIRO Publishing, Melbourne.

Clarence City Council. (2011-2016). *Bushfire Management Strategy for Council Owned and Controlled Land*. Clarence City Council, Hobart.

Clarence City Council. (2016-2021). *Bushfire Management Strategy - Best Management Practice Guidelines.* (Draft). Clarence City Council, Hobart.

Conroy B. (1988) Bushfire management planning in natural areas. In proceedings of the conference - *Caring for Warringah's Bushland*. Warringah Council, Dee Why, NSW.

Department of Primary Industries, Parks, Water and Environment. (2015). *Natural Values Atlas Version 3.3.0.11.*

Department of Primary Industries, Parks, Water and Environment. (2015). *The LIST LISTCORE-1.0.36-809*

Driessen M. M., Taylor R. J. and Hocking G. J. (1991) Trends in abundance of three marsupials after fire. *Australian Mammalogy,* **14**, 121-4.

Fensham R. (1991) *Fire Management in Hobart's Bushlands.* Unpublished report to Hobart City Council.

Forest Conservation Fund (2007) *Conservation Value Index Technical Report*. FCF Assessment Methodology Advisory Panel.

Forest Practices Authority (2005) *Forest Botany Manual*. Forest Practices Authority Tasmania.

Forestry Tasmania 1999, *Identifying pests in Tasmania's forests: information sheet 4, Gumleaf skeletoniser,* Hobart, viewed 2 February 2012 <http://cdn.forestrytasmania.com.au/uploads/File/pdf/forest_health_leaflets/insect_pests/pestsinfosheet4gumleafskeletoniser.pdf>

Gould J. S., McCaw W. L., Cheney N. P., Ellis P. F. and Mathews S, (2007) *Field guide: fuel assessment and fire behaviour prediction in dry eucalypt forest.* Ensis-CSIRO, Canberra, ACT and Department of Environment and Conservation, Perth, WA.

Harris S. & Kitchener A. (2005). *From Forest to Fjaeldmark: Descriptions of Tasmania's Vegetation.* Department of Primary Industries, Water and Environment, Printing Authority of Tasmania, Hobart.

Hines F., Tolhurst K. G., Wilson A. A. G and McCarthy G. J. (2010) *Overall Fuel Hazard Assessment Guide 4th Edition*. Fire Research Report 82, Department of Sustainability and Environment. Melbourne.

Hobart Fire Management Area Committee (unpublished). *Hobart Fire Protection Plan 2016* (2016).

Johnson C. N. (1997) Fire and habitat management for a mycophagous marsupial, the Tasmanian bettong *Bettongia gaimardi*. *Australian Journal of Ecology* **22**, 101-105.

Kirkpatrick J. B. (1985). The Viability of Bush in Cities - Ten Years of Change in an Urban Grassy Woodland. *Australian Journal of Botany* **34**, 691-708.

Kirkpatrick J. B. (1994). Grassland communities and significant grassland sites - Tasmania. In *Conservation of lowland native grasslands in south-eastern Australia* - K. McDougall & J.B. Kirkpatrick eds. World Wide Fund For Nature, Sydney.

Luke H. R. and McArthur A. G. (1986) *Bushfires in Australia*. CSIRO Division of Forest Research, Canberra.

Lunt I. D. and Morgan J. W. (1998) *Second Generation Management of Grassland Reserves: Lessons from First Generation Reserves*. A report to the Victorian Grassy Ecosystem Reference Group. Unpublished Draft Report.

Marsden-Smedley J. B. (2009) *Planned Burning in Tasmania, operational guidelines and review of current knowledge.* Fire Management Section, Reserves and Wildlife Service, Department of Primary Industries, Water and the Environment, Hobart.

NEMC (2010) *National Emergency Risk Assessment Guidelines.* National Emergency Management Committee, Hobart.

NSW Rural Fire Service (1997) *Prescribed Burning Course Manual.* NSW Rural Fire Service, Sydney.

Pyrke A. F. and Marsden-Smedley J. B. (2005). Fire-attributes categories, fire sensitivity, and flammability of Tasmanian vegetation communities. *Tasforests* **16**, 35-46

Sinclair Knight Mertz (1998) *Fire Management Plan for Pilchers Hill.* Report prepared for Clarence City Council.

Standards Australia Limited. (2011). *AS 3959-2009 Construction of buildings in bushfire-prone areas (incorporating Amendments Nos 1, 2 and 3).* Sydney: SAI Global Limited.

Standards Australia Limited. (2009). *AS/NZS ISO 31000:2009 Risk management – Principles and guidelines.* Sydney: SAI Global Limited.

Tasflora (2013) *Reserve Activity Plan 2013-2018, Pilchers Hill Bushland Reserve.* Report prepared for Clarence City Council.

Tasmanian Fire Service. (2015). *Bushfire Survival Plan 2015-2016.* Tasmanian Fire Service, Hobart.

Tolhurst K. (1994) Effects of Fuel Reduction Burning on Fuel Loads in a Dry Sclerophyll Forest. In DEST (1994) *Fire & Biodiversity: The Effects & Effectiveness of Fire Management*, Biodiversity Series, Paper No. 8, Biodiversity Unit, Canberra.

Appendix A

Implementation of the previous BMP

The following codes have been used in assessing implementation of the previous Bushfire Management Plan for Pilchers 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.	IS	The bushfire protection measures in section 2.4 of the previous plan have been implemented. Regular monitoring is in place.
3) Erect appropriate signs on tracks and roads to warn reserve users of planned burns.	IS	All appropriate signage erected prior to ignition of planned burns. No users of the park were injured during planned burns.
4) Implement the recovery procedures in MP 12 following planned burns and wildfires.	IS	No bushfires impacted reserve during previous BMP. All hazardous trees inspected and actioned as required prior to leaving planned burn in VMU 1 in 2013. Post burn weed work and monitoring has taken place. No users of the park injured by fires or the effects of fires.
5) Carry out fire trail repairs and maintenance listed in table 8.	PI	All fire trails have been regularly inspected and maintained. During 2011-2016 BMP all fire trails have been re-assessed at an operational level and maintenance assigned as required. The revised fire trail network is in figure 7 and table 7.

RECOMMENDED ACTION	CODE	COMMENT
6) Ensure all fire trails shown on figure 5 are inspected and maintained in a trafficable condition at all times according to MP 2 and fire trail signs are in place and legible.	PI	All fire trails have been regularly inspected and maintained. During 2011-2016 BMP all fire trails have been re-assessed at an operational level and maintenance assigned as required. The revised fire trail network is in figure 7 and table 7. Some fire trail signs have been installed.
7) 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, new gates/locks installed as required.
8) Conduct a familiarisation tour of the reserve for local TFS brigades prior to the start of the fire permit period each year.	PI	Familiarisation tour not taken out. During 2013 Downhams Rd fire TFS traversed reserve. Familiarisation tour to be provided upon request by TFS.
9) Carry out planned burning according to the schedule in table 9 using the procedure in MP 7.	IS	One scheduled planned burn completed in VMU 1 during 2013. Planned burn scheduled for VMU 7 in Autumn 2016.
10) 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/post burn weed management implemented. Follow up weed monitoring/maintenance is occurring.
11) Consult with the DPIPWE Threatened Species Section when carrying out bushfire management activities that may affect populations of threatened flora or fauna.	IS	Permits acquired from DPIPWE as required throughout previous BMP.
12) Avoid burning the whole of any population of a threatened or rare plant species in a single bushfire.	NA	No fires impacted reserve during previous BMP.
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	During previous BMP Clarence City Council Fire and Bushland Management established a Vegetation Monitoring Program. Two assessment plots are planned to be established in VMU 7 during 2016.

RECOMMENDED ACTION	CODE	COMMENT
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	Regimes and prescriptions have been analysed throughout life of previous BMP. During 2015 review process all VMUs regimes and prescriptions have been evaluated to suit best outcomes for asset protection and ecological protection.
15) Coordinate bushfire management, weed management and other management activities using the procedure in MP 9.	IS	Coordination of activities has been undertaken.
16) 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	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.
17) Record bushfire management activities and wildfires using the procedures in MPs 10 and 11.	IS	Since 2013 Council has developed extensive GIS Fire Management context. All available historic fire management information has been input and updated on a regular basis.

Appendix B

Summary of community concerns and comments

in the initial round of community consultation

COMMUNITY CONCERNS and COMMENTS	COUNCIL'S COMMENT
Comment on reduced amount of stolen vehicles being dumped in reserve.	Whilst this is not directly a bushfire management issue, the torching of stolen cars can be an ignition source for bushfires within the park.
Concern over two mature *Eucalypt* sp. close to fence in outer zone at 61 Robin Court.	This is not a bushfire management issue as trees are on lee side of expected prevailing bushfire path. Council inspected both trees and identified both trees healthy at time of assessment, removal not required.
Comment on weeds in reserve behind property in Walana Court that have been put into piles and are now dry, pose a fire threat.	Council will burn in winter 2016.