

**Clarence City Council**

# **Bushfire Management Plan**

Bedlam Walls Reserve  
Geilston Bay

Revised  
January 2017  
Clarence City Council

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# 1. Introduction

This bushfire management plan (BMP) is a revision and expansion of the previous bushfire management plan for Bedlam Walls Reserve prepared by AVK Environmental Management and North Barker Ecosystem Services, and will operate for a period of 5 years after which another review is recommended.

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

## 1.1 Aim

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

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

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

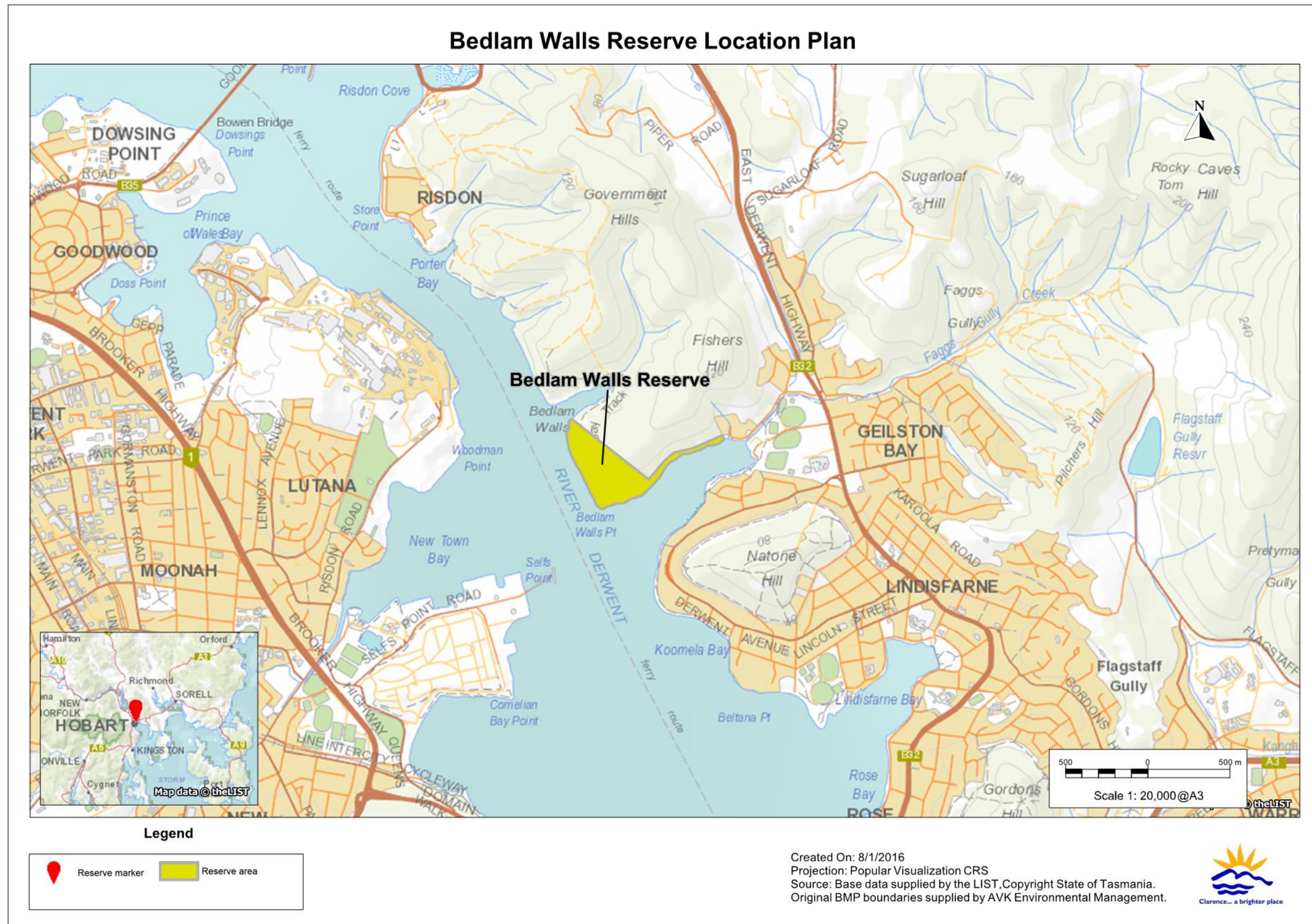
- reduce bushfire hazard to protect assets from bushfires
- maintain the long-term viability of the native vegetation in the reserve
- Assist in the removal of weeds and the regeneration of degraded bushland.

## 1.2 Location and Description

Bedlam Walls Reserve has an area of approximately 15<sup>ha</sup> and is located on the western tip of a headland bounded by Geilston Bay and Shag Bay in the suburb of Geilston Bay. The reserve forms the western slopes of Fishers Hill, which is contiguous with a low range of forested hills on the eastern side of the Derwent River collectively known as Government Hills. This area includes the East Risdon Nature Reserve and extensive private and State-owned bushland. The reserve adjoins an extensive area of privately owned bushland.

Bedlam Walls Reserve has been mapped as a bushfire-prone area in 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 “walls” after which this area is named is a weathered fault line forming a low, straight cliff along the edge of the Derwent River. This is one of only two such formations within the greater Hobart-Clarence area (Sharples, 1994). The geology of the reserve consists of fine sandstone, coarse siltstone and fossiliferous mudstone.

The podsollic soils in the reserve are generally considered of moderate fertility in comparison to other types occurring within the region due to the relatively low rainfall in the area that reduces leaching of nutrients from the soil. Despite this, severe erosion can occur where ground cover is removed or physically disturbed, and relatively poor condition of the vegetation on the reserve reveals the deleterious effects of past land use and management regimes, as outlined in Kirkpatrick *et al* (1988).

### 1.2.2 Vegetation

The major vegetation communities in the reserve are shown in figure 2. Vegetation types and community boundaries within the reserve are based on TASVEG 3.0 mapping, checked and modified where required following a survey of the reserve. Vegetation community boundaries outside the reserve have not been checked for accuracy but are shown to give an indication of the surrounding vegetation. The reserve contains an open area of native *Themeda* grassland (GTL) with the remainder grassy woodlands and forests including *Eucalyptus viminalis* grassy forest and woodland (DVG), *Eucalyptus amygdalina* forest and woodland on mudstone (DAM), and *Bursaria* – *Acacia* woodland and scrub (NBA). A panhandle shaped extension of the reserve includes a south facing slope above Geilston Bay which supports *Eucalyptus globulus* forest (DGL).

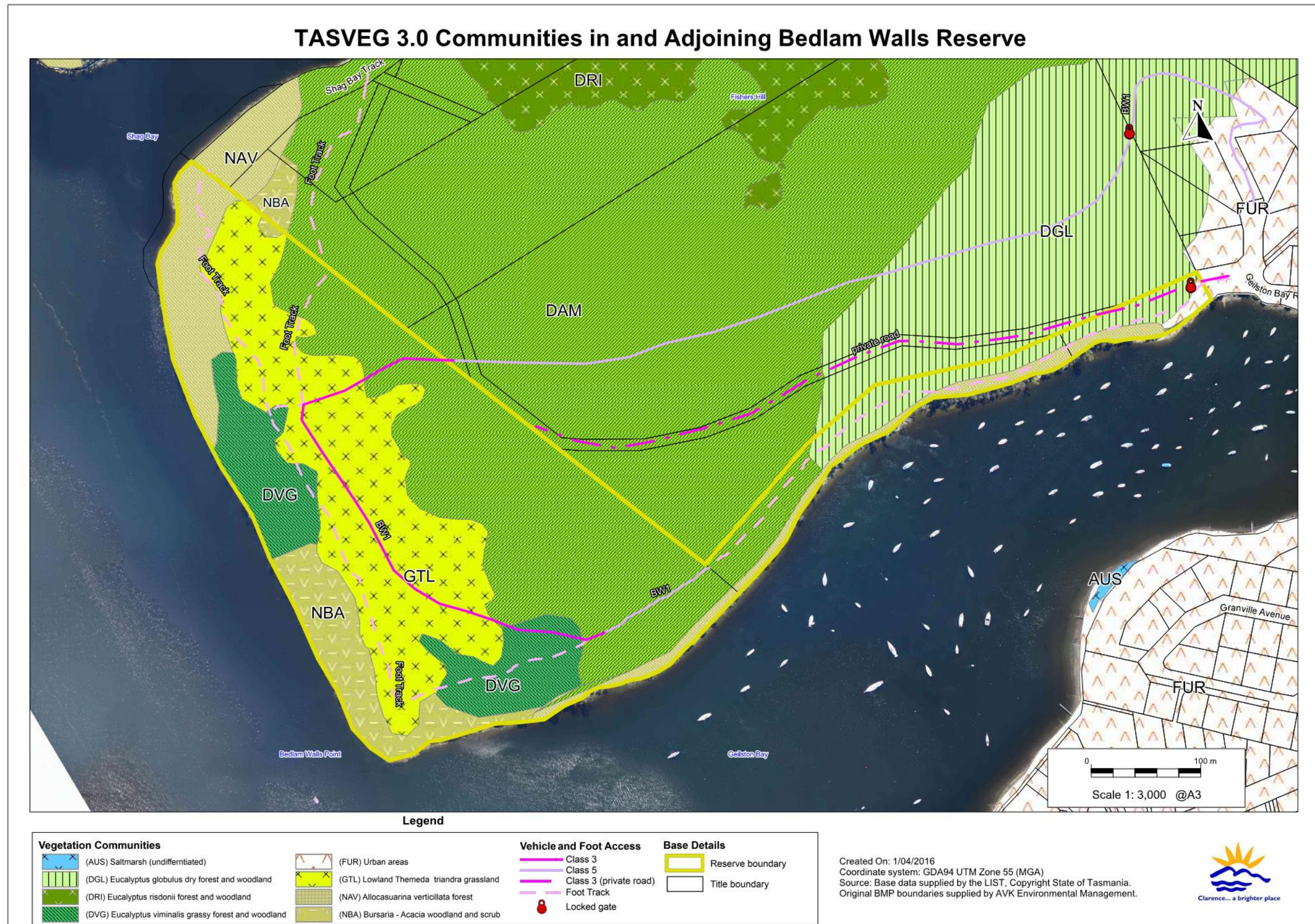
*Eucalypt globulus* dry forest and woodland (DGL) is listed as a threatened native vegetation community under the *Nature Conservation Act 2002*.

On the western tip of the reserve is a community of *Allocasuarina verticillata* forest (NAV) to around 5-10m in height, with a grassy understorey. Species diversity within this community is low, with few shrubs or forb species in the understorey, however a range of native and exotic grass species are found, including kangaroo grass (*Themeda triandra*), wallaby grass (*Danthonia spp.*), and the introduced Yorkshire fog-grass (*Holcus lanatus*) which has attained dominance in this and other parts of the reserve.

The native grassland in the reserve includes kangaroo grass (*Themeda triandra*), tussock grasses (*Poa spp.*) and speargrass (*Stipa spp.*) along with a range of herb and graminoid species, including patches of mat-rush or sagg (*Lomandra longifolia*). Considerable invasion by exotic grass species has occurred within this community, with Yorkshire fog-grass and creeping bent grass becoming locally dominant.



Figure 2 – Vegetation types in the reserve





The grassy woodland/forest communities in the reserve are dominated by an open canopy of black peppermint (*Eucalyptus amygdalina*) and white gum (*Eucalyptus viminalis*) to 20m with an understorey of scattered silver wattle (*Acacia dealbata*) and native cherry (*Exocarpos cupressiformis*), over a patchy understorey of grasses. This community is similar to that found in adjoining bushland areas within the Government Hills and the Meehan Range. It is noted that at Bedlam Walls, the community grades into one of Risdon peppermint (*Eucalyptus risdonii*) and a hybrid swarm between *Eucalyptus risdonii* and *Eucalyptus amygdalina* which is of high scientific interest.

### 1.2.3 Reserve Usage

The reserve is a locally important recreational area for activities such as; walking, bike riding, dog exercising and jogging. The reserve affords excellent views of the Derwent River and has contains important Aboriginal heritage sites.

## 1.3 Bushfire Management Objectives

Bushfire management within the Bedlam Walls 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 reserve is the responsibility of the Clarence City Council although the infrastructure associated with the "Aboriginal Heritage Trail" (including tracks and the midden and shelter sites) are managed by Tasmanian Parks and Wildlife. 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 bushfire management plan will help to fulfil that "duty of care". The TFS is responsible for suppressing bushfires within the reserve.

### **1.4.1 Reserve Management Plan**

There is no general management plan or activity plan for the Bedlam Walls Reserve. Given the size of the reserve and its location, it is considered more practical to include the reserve in a plan of management for the whole Government Hills area, than to prepare a plan for the reserve in isolation.

## 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 the Bedlam Walls Reserve is shown on figure 3.

#### 2.1.1 Bushfires

Data supplied by the TFS showed that within the period 1997 to 2014 there were seven vegetation fires within the reserve. Six were <1<sup>ha</sup> in size and one being 3<sup>ha</sup>.

In March 2006 a bushfire in Government Hills to the north-west of the reserve also burnt a corner of the reserve. The ignition source was determined to be powerlines clashing together in strong winds. There are no other records of significant bushfires occurring within the reserve.

#### 2.1.2 Planned Fires

A planned burn was carried out in VMU 1 in April 2011 (see figure 4). There are no other records of planned burning within the reserve.

### 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 fire front) fires with flame heights greater than 10m are generally uncontrollable (NSW Rural Fire Service, 1997). Although grass fires rarely attain a very high intensity, they can move much faster than forest fires, thereby making them difficult to contain.

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



Figure 3 – Bushfire history (1999-2014)

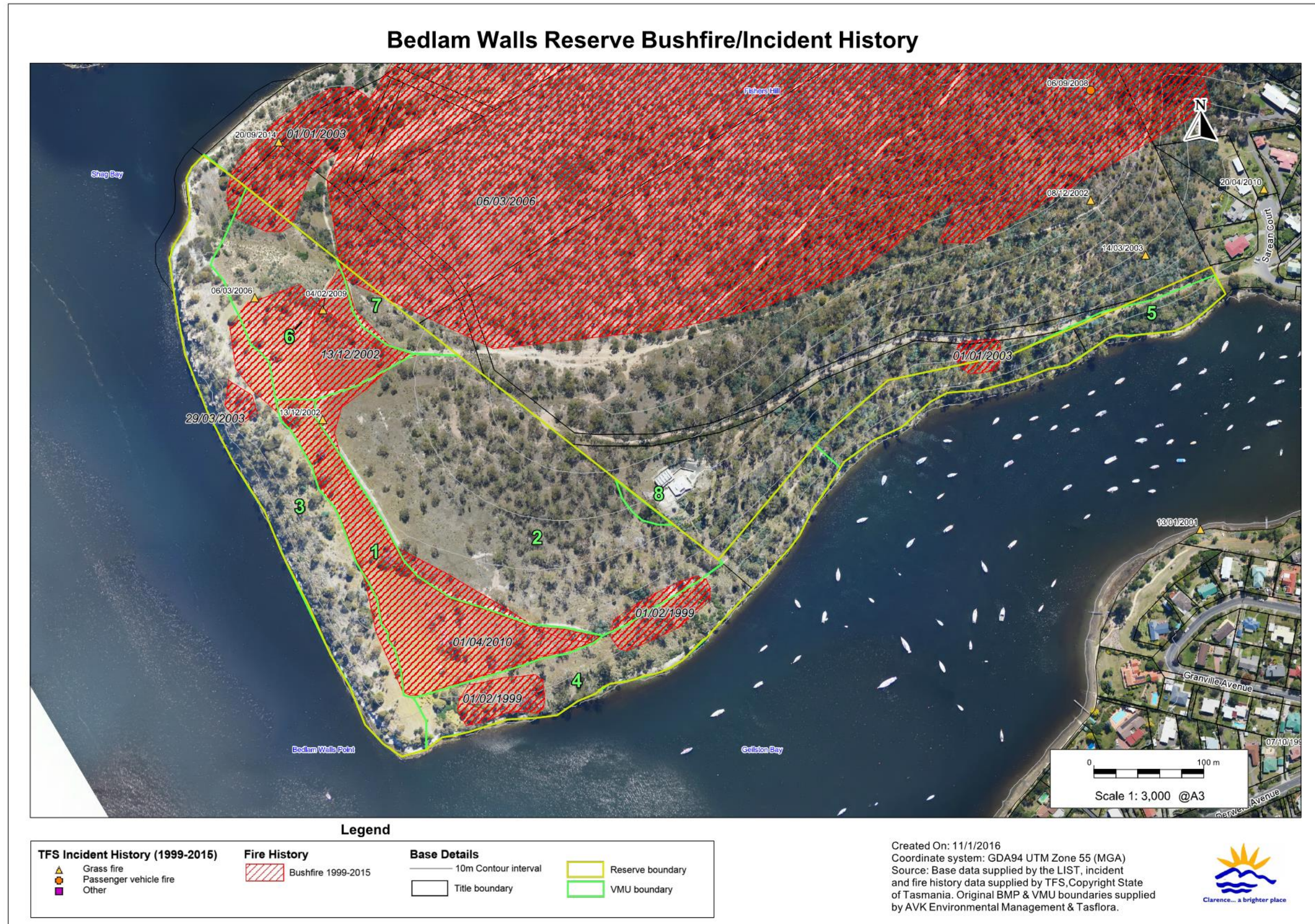
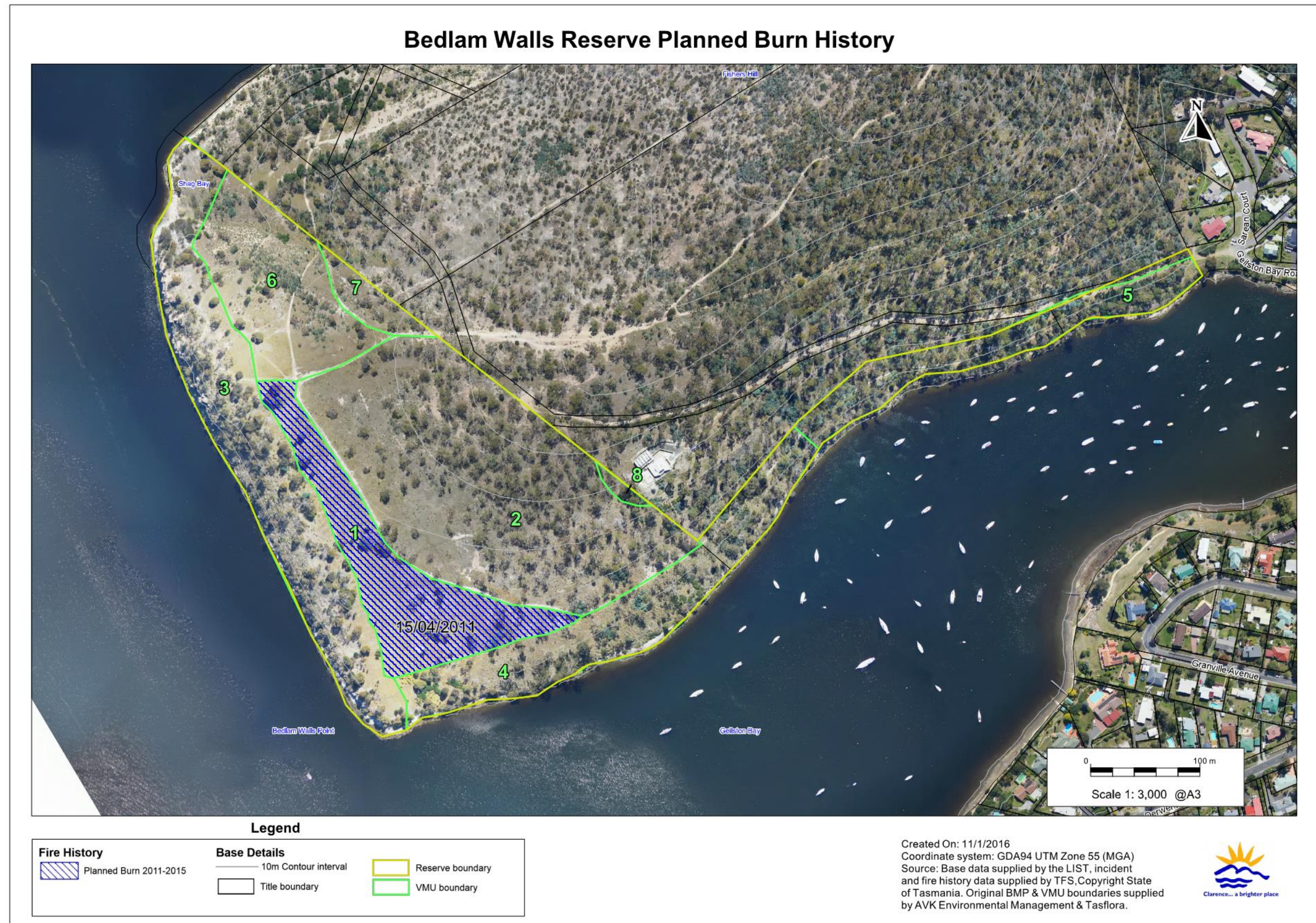




Figure 4 – Reserve planned burning history (2011-2015)





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 bushfire. In the absence of fire, 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 (Marsden-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.

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 reserve is given in table 1. The TASVEG 3.0 codes of the vegetation types in figure 2 corresponding to each fuel type are listed under the fuel type.

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

FUEL TYPE	FUEL HAZARD CHARACTERISTICS	BUSHFIRE BEHAVIOUR AND CONTROL
Shrubby forest / woodland DGL <sup>1</sup>	Canopy, bark, elevated, near surface and surface fuels all present. Shrub layer to about 1 m in height but some areas have shrubs up to 3 m high. Near surface fuels a mixture of grasses and heathy shrubs. Leaf and bark fall around trees contributes to a gradual build-up of fuel, particularly around the base of trees. Generally moderate overall fuel loads, but high where there is dense shrub growth. 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 accumulation. Significant ember attack on structures downwind of the bushfire 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. Tree cover can sustain a crown fire and 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, elevated fuels and the bark fuels largely responsible for spotting, but grass and bracken fuels can be replenished within a year or two after a burn.
Grassy forest / woodland DAM DVG	Canopy, near surface and surface fuel all present, bark fuels only present on rough-barked trees and shrubs. Low-moderate fuel loads, grass cover generally sparser and lower in height than in open grassland. Dense patches <i>Lomandra</i> sp. up to 1m in height. Leaves, bark and dead fallen limbs 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.

FUEL TYPE	FUEL HAZARD CHARACTERISTICS	BUSHFIRE BEHAVIOUR AND CONTROL
Shrubland NAV NBA	Moderate fuel loads, predominately elevated fuels 4-5m high. 20-40mm deep duff layer in addition to finer fuels on surface. Fallen dead limbs and build-up of bark around base of remnant <i>Eucalypt</i> sp. Some patches of dense shrub/ <i>Lomandra</i> sp.	Where shrub canopies touch it can sustain a running crown fire of high intensity on days of extreme fire weather that would be difficult to control. Dense thickets are difficult to access. Significant ember attack on nearby structures and spotting across containment lines can be expected. Difficult to prescribe burn in cool weather due to low surface and near surface fuel loads.
Unmanaged grassland GTL	Native and introduced grass sp. present. Clumps of dense <i>Lomandra</i> sp. up to 1m. Sparse elevated fuels up to 2m. Bark/branch build-up at base of sparse <i>Eucalyptus</i> sp. some with burnt bases. Burnt bases can create flying embers. Canopy open and cannot sustain crown fire at time of assessment. Flammability dependant on degree of curing of grass. Grass fuels can be replenished within a year after a burn.	Can generate rapidly moving, moderate intensity fires in late summer and early autumn. Fires can occur at other times of the year if the cured standing crop from the previous year's growth persists. Fires can spot but usually will be stopped at roads and firebreaks, however, fires may be uncontrollable in extreme conditions.

<sup>1</sup>Threatened native vegetation community *Nature Conservation Act 2002*.

Average fuel loading on south-east facing slopes is 6-13<sup>t</sup>/ha. Average fuel loading on western facing grasslands is up to 7<sup>t</sup>/ha, predominately grasses, *Lomandra* sp. and fallen dead branches.

There is a general less grass fuels in the adjoining privately owned bushland upslope of the reserve.

## 2.3 Bushfire Threat and Risk to Persons

The behaviour of the last major bushfire in the area and TFS data on bushfire ignitions (see figure 3) indicates that the main bushfire threat to the Bedlam Walls Reserve is likely to come from large fires in the bushland on the adjoining Government Hills rather than from within the reserve. There is a network of fire trails in Government Hills that have the potential to enable TFS to control fires before they reach the reserve. As at 2015 there is enough accumulation of fine fuels within the reserve for a grassfire starting within the reserve to spread to adjoining bushland.

As the reserve runs along the coast the risk to persons in the reserve during a bushfire is considered to be low.

## 2.4 Assets at Risk from Bushfire

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

### 2.4.1 Bushfire Risk to Natural Heritage Assets

The conservation value of plant communities within Bedlam Walls Reserve is given in table 2. A number of plant species of conservation value occur within the reserve. These are listed in table 3 along with their response to bushfire if known. No fauna of conservation value have been reported recently within the reserve, however the swift parrot (*Lathamus discolor*) has been recorded nearby and there is potential habitat for this species in the *Eucalyptus globulus* dry forest and woodland within the reserve. The eastern barred bandicoot (*Perameles gunnii*) and the Tasmanian bettong (*Bettongia gaimardi*) have been recorded in the Government Hills and are likely to occur in the reserve. The habitat requirements and preferred bushfire management of these species is given in table 4.

Recruitment of eucalypts and other native trees and shrubs is occurring within the reserve resulting in a woodland/grassy forest vegetation type. Refer to section 4.3 and table 9 on fire regimes to assist with recruitment if required.

**Table 2 – Conservation value of native plant communities**

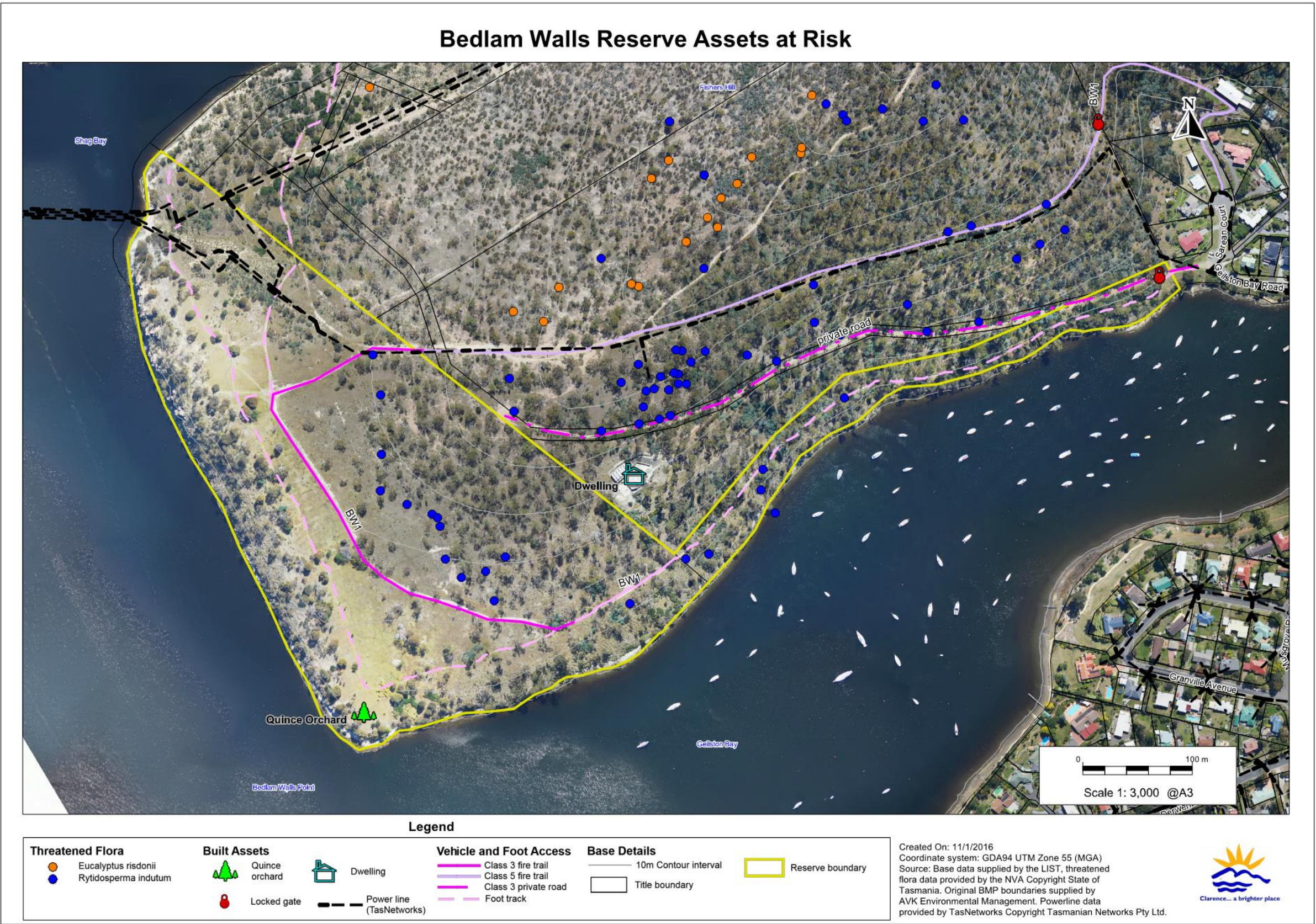
TASVEG 3.0 CODE	EQUIVALENT FLORISTIC COMMUNITY <sup>1</sup>	Conservation Status <sup>2</sup>
DAM	DRY-gAMmud Grassy <i>E. amygdalina</i> forest	Not threatened
DGL	DRY-gGLOB Grassy <i>E. globulus</i> forest	THREATENED NATIVE COMMUNITY
DVG	DRY-gVIM Grassy <i>E. viminalis</i> woodland	Not threatened
GTL	Various floristic associations	Not threatened
NBA	None described	Not threatened
NVA	DRY-in VERT Inland <i>A. verticillata</i> low forest	Not threatened

<sup>1</sup> Forest Practices Authority (2005)

<sup>2</sup> Nature Conservation Act 2002



Figure 5 – Assets at risk from bushfire





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

<b>SPECIES</b>	<b>CONSERVATION STATUS<sup>1</sup></b>	<b>OCCURRENCE</b>	<b>RESPONSE TO BUSHFIRE AND MANAGEMENT</b>	<b>ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999 (EPBC Act) STATUS</b>
<i>Rytidosperma indutum</i> tall wallaby grass	RARE	Common in grassy forest and woodland.	Will regenerate by resprouting after damage. Often found in open areas along road and track edges after fire. Reproduction increases after fire and other gap forming disturbance.	Not threatened
<i>Spyridium eriocephalum</i> heath spyridium	ENDANGERED	Known from a tiny population (only 1 plant surviving in 2006) close to the north-east boundary of the reserve on property managed by Parks & Wildlife Service on slopes above Shag Bay.	The response of the species to fire is poorly known, considering its rarity, it is considered important that plants are protected from inadvertent burning.  Fire intervals in the order of 8 to 20 years are preferred to retain the dry shrubland/woodland habitat.	Not threatened

<sup>1</sup> Tasmanian Threatened Species Protection Act 1995

**Table 4 - Fauna of conservation value and preferred bushfire management**

SPECIES	CONSERVATION STATUS <sup>1</sup>	HABITAT AND PREFERRED BUSHFIRE MANAGEMENT	ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999 (EPBC Act) STATUS
<i>Bettongia gaimardi</i> Tasmanian bettong	Not listed but 'requires monitoring <sup>2</sup>	<p>Widespread and well represented in dry sclerophyll forest. Research suggests that activity at a site usually increases immediately following a bushfire but subsequently declines as the dense regrowth provides less favourable habitat (Driessen et al 1991). The relationship between bettong abundance and bushfire is not clear-cut and it has been suggested that frequent firing of habitat will cause a long-term decline in the species richness and abundance of soil fungi (Johnson, 1997). These fungal species are associated with the litter layer and organic matter near the soil surface and are thus sensitive to fire. Bushfire is thought to synchronise fruiting cycles within populations of fungi so that they trigger a pulse sporocarp production and this is followed by years of low sporocarp production (Johnson, 1997).</p> <p><b>Management should maintain a diversity of fire age classes in dry forest ensuring both a spatial and temporal mosaic and help mitigate devastating bushfires.</b></p>	Not threatened
<i>Lathamus discolor</i> Swift parrot	ENDANGERED	<p>Known to breed in Meehan Range east of Pilchers Hill and likely to nest elsewhere. Nests in hollows in old growth eucalypts (Brereton 1997).</p> <p>Blue gums (<i>Eucalyptus globulus</i>) provide a preferred foraging habitat although swamp gums (<i>E. ovata</i>) are recognised as being particularly important as an alternative nectar source. The swift parrot feeds in the tree canopy and therefore an extensive, high-intensity bushfire which scorched the canopy could reduce the potential food resources for this species within a reserve. However, a temporary loss of food resources in a reserve due to a localised bushfire is unlikely to have a significant impact on regional food sources for this species.</p> <p><b>Management should aim to avoid crown damage to larger trees by keeping planned burns at a low intensity and reducing the bushfire hazard to reduce the intensity of bushfires.</b></p>	ENDANGERED



SPECIES	CONSERVATION STATUS <sup>1</sup>	HABITAT AND PREFERRED BUSHFIRE MANAGEMENT	ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999 (EPBC Act) STATUS
<i>Perameles gunnii</i> Eastern barred bandicoot	Not listed	Grasslands (both native and introduced) and grassy woodlands. Dense cover of regrowth is likely to be unsuitable habitat. <b>Mosaic burning will ensure open habitats are maintained and help mitigate devastating bushfires.</b>	VULNERABLE

<sup>1</sup> Tasmanian *Threatened Species Protection Act* 1995<sup>2</sup> Vertebrate Advisory Committee, 1994

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

**Table 5 – Fire attributes of the native vegetation**

<b>TASVEG 3.0 CODES</b>	<b>FIRE SENSITIVITY</b>	<b>FLAMMABILITY</b>
DAM	Low	High
DGL	Low	High
DVG	Low	High
NBA	Low	High
NAV	Low	Moderate
GTL	Low	High

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

<b>FLAMMABILITY</b>	<b>CRITERIA FOR FLAMMABILITY</b>
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)

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

The low fire sensitivity of the native vegetation in the reserve indicates that it is highly fire adapted and a single 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 in the reserve in Pyrke & Marsden-Smedley (2005) indicates that the bushland in the reserve will burn readily when fuels are dry but may be too moist to burn for long periods during winter. Fuels will generally be dry enough to burn on most days from late spring to early autumn.

#### **2.4.2 Bushfire and Habitat Management**

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

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

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

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

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

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

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

TASVEG MAPPING UNITS <sup>1</sup>	BUSHFIRE IMPACTS AND BUSHFIRE MANAGEMENT AIMS
<b>Grassy dry sclerophyll forests and woodlands</b>	
<p>DGL – <i>Eucalyptus globulus</i> dry forest and woodland</p> <p>DAM – <i>Eucalyptus amygdalina</i> forest on mudstone</p> <p>DVG – <i>Eucalyptus viminalis</i> grassy forest and woodland</p>	<p>Infrequently burnt sites develop a dense shrubby understorey. Kangaroo grass (<i>Themeda triandra</i>) can die out after an extended absence of bushfire, or other method of biomass reduction (Lunt &amp; Morgan, 1998).</p> <p>Frequent fires (&lt; 5 years) can inhibit tree regeneration and eliminate the shrubby component</p> <p>Sites overlying dolerite and other more fertile soils have markedly more rapid rates of regeneration than low fertility soils derived from mudstone and sandstone.</p> <p>Overfrequent burning regimes in the past within much of forest overlying mudstones has contributed to loss of topsoil and erosion.</p> <p>Extended absence from bushfire can result in build-up of fuel causing hot and damaging burns.</p> <p>A temporal and spatial mosaic burning pattern would assist with tempering the effects of a devastating bushfire.</p> <p><b>Optimal fire frequency is 5-20 years on fertile sites.</b></p> <p><b>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.</b></p>
<b>Non eucalypt forests/woodlands</b>	
<p>NBA – <i>Bursaria</i> / <i>Acacia</i> woodland and shrub</p>	<p>This community is typically derived from eucalypt woodland. It is a degradation phase often associated with extended periods of moderate to high intensity grazing.</p> <p>Fire regimes will influence the nature of regeneration. Important to allow for a period of absence from bushfire where eucalypts can re-establish if desired.</p> <p><b>Optimal bushfire frequency is 5-20 years.</b></p> <p><b>Exclude bushfire from representative areas to provide controls for monitoring the effects of fire.</b></p>

TASVEG MAPPING UNITS <sup>1</sup>	BUSHFIRE IMPACTS AND BUSHFIRE MANAGEMENT AIMS
NAV – <i>Allocasuarina verticillata</i> Forest	<p>Extended absence of fires leads to a closed canopy and a dense litter layer that has a low density and diversity of ground layer species, although it may be important for invertebrate species.</p> <p>Frequent low intensity fires benefit <i>Allocasuarina verticillata</i> over the adjacent eucalypt dominated communities (Kirkpatrick, 1985).</p> <p>Tendency to exclude bushfire for visual impact reasons in foreshore environments risks the long-term loss of regenerative age classes and the ultimate decline of this community in favour of grassland. Alternate methods of facilitating natural regeneration through localised clearance may be a more suitable method.</p> <p><b>Exclude bushfire for the duration of the plan from foreshore reserves.</b></p> <p><b>Preferred bushfire interval in inland reserves is between 15-25 years.</b></p>
<b>Grasslands</b>	
GTL – Themeda grassland	<p>Bushfire intervals &gt; 5 years may lead to a loss of biodiversity in grassy sites (Lunt &amp; Morgan, 1988).</p> <p>Frequent bushfires (&lt; 5 year intervals) may lead to a loss in diversity of invertebrates.</p> <p>Low fire sensitivity and high flammability – appropriate fire interval 3-50 years. Suppression not usually an ecological priority except in specific situations (Pyrke &amp; Marsden-Smedley, 2005).</p> <p>Grasslands at Bedlam Walls have not closed out. Partially burnt in 2010.</p> <p><b>Exclude bushfire from remainder of site for duration of plan.</b></p>

### 2.4.3 Bushfire Risk to Built and Cultural Assets

During the BMP review process Aboriginal Heritage Tasmania (AHT) was asked to check the Aboriginal Heritage Register (AHR) for known sites inside the Bedlam Walls Reserve BMP boundary. This search identified 31 known sites in the Reserve including shell middens, scattered artefacts, stone quarries or rock shelters. Proposed management strategies to preserve these sites are mentioned in Table 7 under “Other Bushfire Risks”.

The reserve also features an “Aboriginal Heritage Trail” highlighting the long history of Aboriginal occupation of the area. This trail was listed on the Register of the National Estate (closed in 2007 and no longer a statutory list).

A small stand of quince trees and some building foundations are evidence of past European usage of the area. These could be damaged by a high intensity bushfire, or frequent hazard reduction burning.

The only infrastructure in the reserve is a high voltage electricity transmission line which crosses the northern end of the reserve from a submarine cable under the Derwent River. This line is supported on steel and concrete posts and is considered at low risk from bushfire. The only asset likely to be immediately affected by fires moving out of the reserve is a house on an adjoining private lot.

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 a bushfire causing damage to an asset is a function the degree of danger, the probability of a bushfire igniting, and any measures taken to prevent the bushfire causing damage.

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

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

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

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

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

There is insufficient data available to assess the likelihood of a high intensity bushfire starting in the reserve; however there is sufficient fine fuel within the reserve to sustain a high intensity bushfire on days of extreme fire danger. The bushfire risk to the built and cultural heritage assets within and surrounding the reserve has been assessed using a procedure adapted from the National Emergency Risk Assessment Guidelines (NEMC, 2010). The assessment process is explained in section 5.4 of *Clarence City Council - Bushfire Management Strategy for Council Owned and Controlled Land*. The results and proposed management strategies are shown in table 7. This assessment process has been analysed and complies with AS/NZS IOS:31000-2009. Note that the assessment in table 7 only considers the risk from fires starting in, or passing through the reserve. Some assets may face a greater bushfire risk from nearby bushfire hazards that are not under the control of Clarence City Council. Some assets, such as Aboriginal heritage sites, may not be directly damaged by bushfire but may be damaged by bushfire management and bushfire suppression activities, such as constructing fire control lines. These risks are noted under “other risks” in table 7.

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

**Table 7 - Bushfire risk assessment for built and cultural assets**

RISK CATEGORIES											
LOW – asset of low value or considered to have a low risk of damage from bushfires in the reserve due to its construction, location, or protection measures already in place.											
MODERATE – asset is vulnerable to damage by bushfires and could face attack by a moderate to high intensity bushfire, but has features that will reduce the intensity of the fire attack, or provide some protection from fires. Further bushfire protection measures are required.											
HIGH – asset is of high value, is vulnerable to damage by bushfires and could face attack by a high intensity bushfire with few, if any, features that would reduce the intensity of fire attack. Further bushfire protection measures are required.											
ASSET AT RISK	RISK ANALYSIS (See section 5.4 of the Bushfire Management Strategy)								OTHER BUSHFIRE RISKS	PROPOSED MANAGEMENT STRATEGIES	
	A	B	C	D	E <sup>1</sup>	F	G	Level of Risk			
Dwelling at 76 Geilston Bay Road	3	3	3	2	2	2	6	1296 Moderate		Advise owner of the need to maintain an adequate defensible space around the dwelling. Maintain an outer zone in the portion of the reserve within 30m of the dwelling. See MP 6 in the Best Management Practice Guidelines.	
Electricity transmission line within the reserve	2	2	1	0	2	2	1	0 Minimal		Maintain existing easement.	
Aboriginal heritage sites									May be damaged by vehicle movements during bushfire management or suppression, and establishment of fire control lines.	Ensure that the TFS is aware that the reserve has known sites and their importance. Do not take vehicles off existing trails, except if there is a threat to crew safety. Only use existing trails and tracks for fire control lines, or use wet lines.	

1 – Note that the risk analysis score in column E only indicates that there is enough space to provide a defensible space between bushland in the reserve and an adjoining asset. It does not indicate that a defensible 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 Bedlam Walls Reserve, a review of the success of the implementation of the recommendation of the previous BMP was carried out. The review found that of 17 recommendations 8 have been fully implemented, 4 have been partly implemented, 2 have not been implemented because they have not been required (i.e. they are actions in response to other incidents) and 3 have not been implemented. Of the recommendations that have not been implemented or partially implemented the 2 most important are a community bushfire awareness program and informing the TFS of the location and importance of the Aboriginal heritage sites in the reserve. The full findings of the review are in Appendix A.

#### **3.1.2 Planned Burning**

The previous BMP recommended excluding fire for the duration and reassessing the necessity of planned burning for the next BMP based if natural recruitment of canopy species was not occurring. At time of assessment in 2015 natural recruitment is occurring with 4 eucalypt age classes present. Recruitment is sparse but is typical of the recruitment expected in a grassland/woodland forest type. The long term goal of vegetation management in the reserve is to assist with the maintenance of grassland/woodland forest type; exclusion of fire is the best approach.

Section 4.3 and table 9 shows the preferred regime to support recruitment of eucalypts if deemed required.

The previous BMP recommended no burning for ecosystem management considered necessary. The next 5 year period of the plan will recommend patch burning as detailed in table 9. No broadscale burning has been recommended for the next 5 years.

#### **3.1.3 Vehicle Access Routes and Foot Tracks**

There are currently two entrances into the reserve, one from a private road off Geilston Bay Road, the other through private property from Sarean Court, Geilston Bay. The private road has a boom gate with Council padlock and approved entrance for TFS.

Locked gates prevent unauthorised vehicle access to the fire trails leading to the reserve, and unauthorised use by trails bikes and 4WD vehicles is rare. Pedestrian access is via a foot track from the western end of Geilston Bay Road.

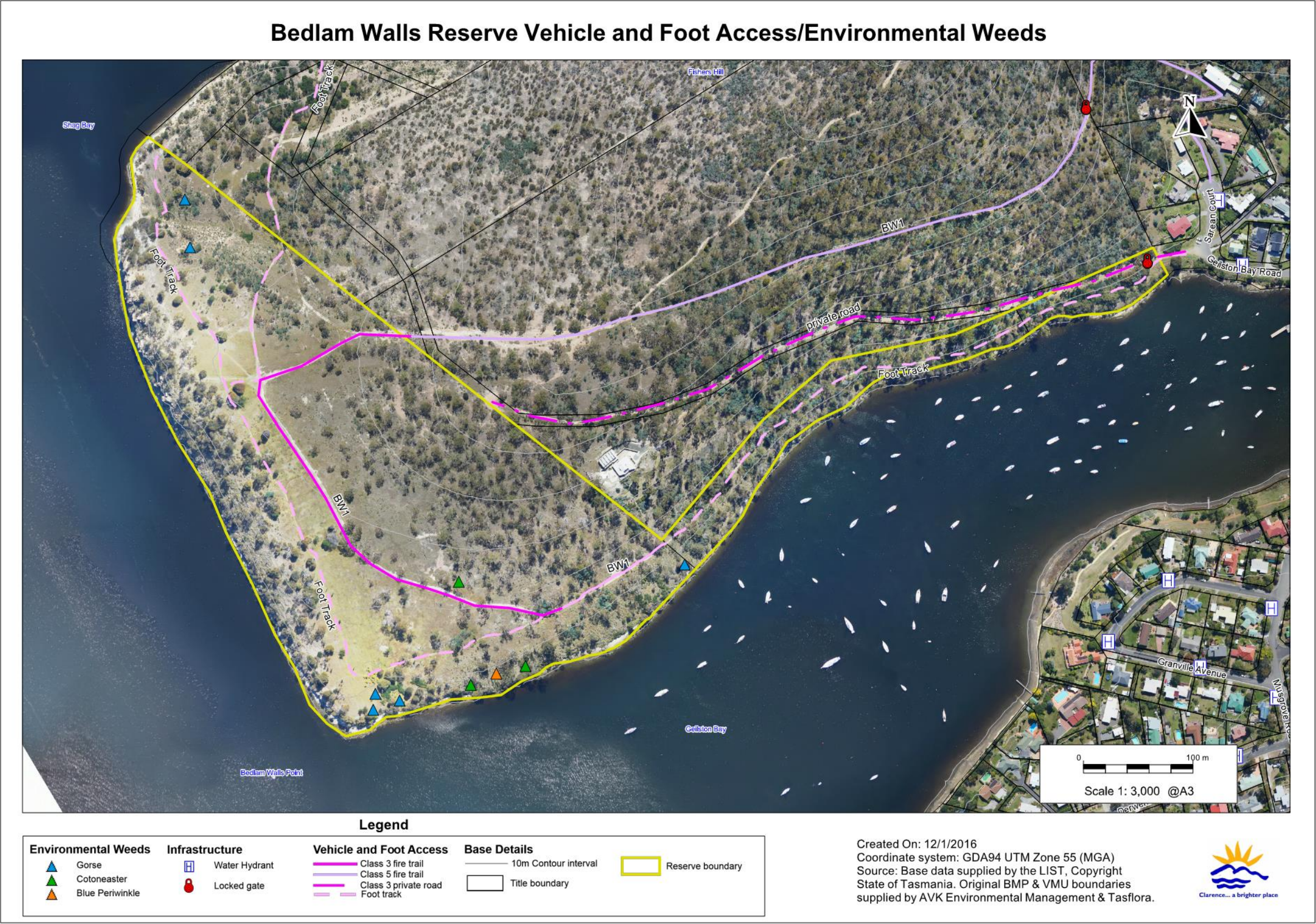
The location of the trails within the reserve considered necessary for bushfire management are shown in figure 5 and described in Table 8.

Each fire trail has been assigned a usage class and its current condition assessed against the standard for their assigned usage class in MP 1 in *Clarence City Council - Bushfire Management Strategy – Best Management Practice Guidelines*.

Vehicle usage should be restricted to existing formed tracks to avoid damaging Aboriginal heritage sites.



Figure 6 – Vehicle and foot access/environmental weeds





**Table 8 - Condition and maintenance of fire trails in the reserve**

Assigned usage class (MP 1): <b>Class 1</b> - all 2WD and 4WD vehicles <b>Class 3</b> - all weather 4WD, light and heavy 4WD vehicles (category 3, 4 & 5 tankers) <b>Class 5</b> - 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.	Maintenance priority: <b>High</b> priority - major through routes and fire control lines <b>Medium</b> priority - important access and escape routes and minor fire control lines <b>Low</b> priority - minor access routes and boundaries of vegetation management units.
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The trail usage class describes the suitability of the fire trail if properly maintained, not necessarily its condition at the time of inspection.

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

FIRE TRAIL ID	USAGE CLASS	STRATEGIC FIRE TRAIL UNDER HOBART FIRE PROTECTION PLAN <sup>1</sup>	MAINTENANCE PRIORITY	LOCATION AND CONDITION AT DECEMBER 2015	ACTION REQUIRED	MANAGEMENT CONSTRAINT
BW1	5	NO	Medium	Runs from the end of Geilston Bay Road to the reserve. This access runs through private property.  Access into the reserve on private property currently meets class 5 standards. Trail has an eroded section just before entering the reserve.  At time of inspection the section within the reserve requires vegetation pruning to meet class 3 usage standards.	Inspection and maintenance of section within reserve as specified in MP2.	Sections not on Council land.
Private Road	5	NO	Privately maintained	Meets class 3 standards. Only one passing bay at entrance to private residence	None	Council officers to ring land owner prior to using other than in emergency situation.

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

If adequately maintained, the existing trails and foot tracks provide adequate access to the reserve for bushfire management. The foot tracks have been used as fire control lines for previous fuel reduction burning within the reserve.

#### **3.1.4 Water Supply**

There are no water sources within the reserve. Water for firefighting and bushfire management has to be obtained from fire hydrants in Geilston Bay Road (see figure 6).

#### **3.1.5 Fuel Breaks and Defendable Spaces**

A fuel break (sometimes called a “firebreak”) is a strip of cleared, or partly cleared, bushland constructed and maintained to slow, or stop, the progress of a bushfire to assist in its control. They are not the same as defendable spaces which are maintained around vulnerable assets to protect them from bushfires. Fuel breaks in grassland can be effective in stopping fires if cleared down to mineral earth, but where trees and shrubs are present wind-blown burning embers will usually carry a bushfire across a fuel break. Therefore, in bushland with shrubs and trees the only benefit of a fuel break is to provide access for firefighters and a boundary for back burning operations. Currently there are no standards or guidelines for fuel breaks in Tasmania. No fuel breaks are maintained in the reserve and none are considered necessary.

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

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

In the inner zone, flammable materials on, under and around buildings should be removed.

In the inner zone:

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

- Rake up bark and leaves and keep roofs and gutters clear of flammable debris.

The TFS notes that it is not necessary to remove all vegetation from the inner zone. Individual trees rarely cause houses to burn in bushfires. Trees can screen a building from windblown embers while protecting it from radiant heat. Smooth barked trees are less likely to catch fire than those with rough bark. No tree should be able to fall on the building.

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

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

In the outer zone:

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

It was noted that the only dwelling adjoining the reserve would require a small portion of the reserve to be maintained as an outer zone to ensure it has a defensible space that meets current TFS requirements.

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

### **3.1.6 Bushfire Detection and Suppression**

Bedlam Walls Reserve is highly visible from surrounding suburbs, and the western side of the Derwent River. It is likely that any fires within the reserve would be promptly reported.

Based on the analysis of bushfire history and causes in section 2.1.1, the reserve is more likely to be affected by fires originating in the bushland to the east and north-east, than fires originating within the reserve. It is not considered feasible to prevent bushfire movement across the reserve boundary. This problem can best be addressed through development of a comprehensive bushfire management plan incorporating all bushland within the area. This will also ensure coordinated management of identified environmental and cultural values within this visually important and historic area.

## 3.2 Weeds

Gorse (*Ulex europaeus*) is the only weed species found in the reserve that is classified as a declared weed under the Tasmanian *Weed Management Act 1999* and a Weed of National Significance (WONS). Gorse will be targeted as a priority to prevent further spread.

During 2012 the four main gorse communities within the reserve were sprayed, two of these sites were burnt; some follow up spraying is required.

Yorkshire fog grass (*Holcus lanatus*) appears to be the major weed species within the reserve. Small areas of cotoneaster (*Cotoneaster glaucophyllus*) and blue periwinkle (*Vinca major*) are also present.

Observed weed locations in the reserve are shown in figure 6. Please note that these are observations made during the course of fieldwork for revision of the BMP and do not represent a comprehensive weed survey of the 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 informing them that the bushfire management strategy was being revised and inviting them to have input into the revised plan for the reserve by sending in a written submission, attending a community “walk and talk” in the reserve, or by contacting the reviewer directly.

The community “walk and talk” was held in the reserve on 8<sup>th</sup> November 2015 and was attended by five community members and a Council representative. One written comment was received noting the enthusiastic approach the Council Fire and Bushland Crew have and the success of the walk and talk.

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.

The main issue of concern was the amount of fuel between the water’s edge and the foot track from Geilston Bay Road. There were also questions about fire behaviour in the bushfire-prone vegetation within the reserve.

## 4. Plan Implementation

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

### 4.1 Bushfire Risk Reduction Strategy

The overall bushfire risk reduction strategy recommended for the reserve can be summarised as follows:

- Reduce ignitions through prosecution of arsonists, and prompt reporting of fires.
- Maintain access points and hazard reduced areas 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 giving access to the reserve.
- Maintain the inner zone in the reserve to complement defensible spaces on the adjoining property.
- Carry out strategic hazard reduction to protect adjoining assets.
- Encourage the neighbouring resident to maintain a defensible space.

### 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 is recommended to be completed through the duration of the 2016-2021 BMP.

Residents should 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 to be dependent on bushfire to maintain their structure and floristics in the long term. Uneven aged dry eucalypt forests with open understoreys/grasslands such as Bedlam Walls require low intensity fires to create patches of receptive seedbeds and help to maintain diversity in the understorey. During planned burns there is a need to minimise damage to important habitat elements (such as dead trees, old logs and stumps) and to ensure adequate retention of unburnt patches of each forest type to act as refugia for recolonisation of burnt areas.

### 4.3.1 Vegetation Management Units (VMU)

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

The previous BMP divided the reserve into 8 VMUs. These are based on the vegetation types in the reserve and the presence of suitable control lines in the form of fire trails and foot tracks. These have been continued for the duration of this BMP.

These VMUs allow for implementation of the most appropriate methods for managing bushfire hazard whilst promoting biodiversity.

### 4.3.2 Planned Fire Regimes

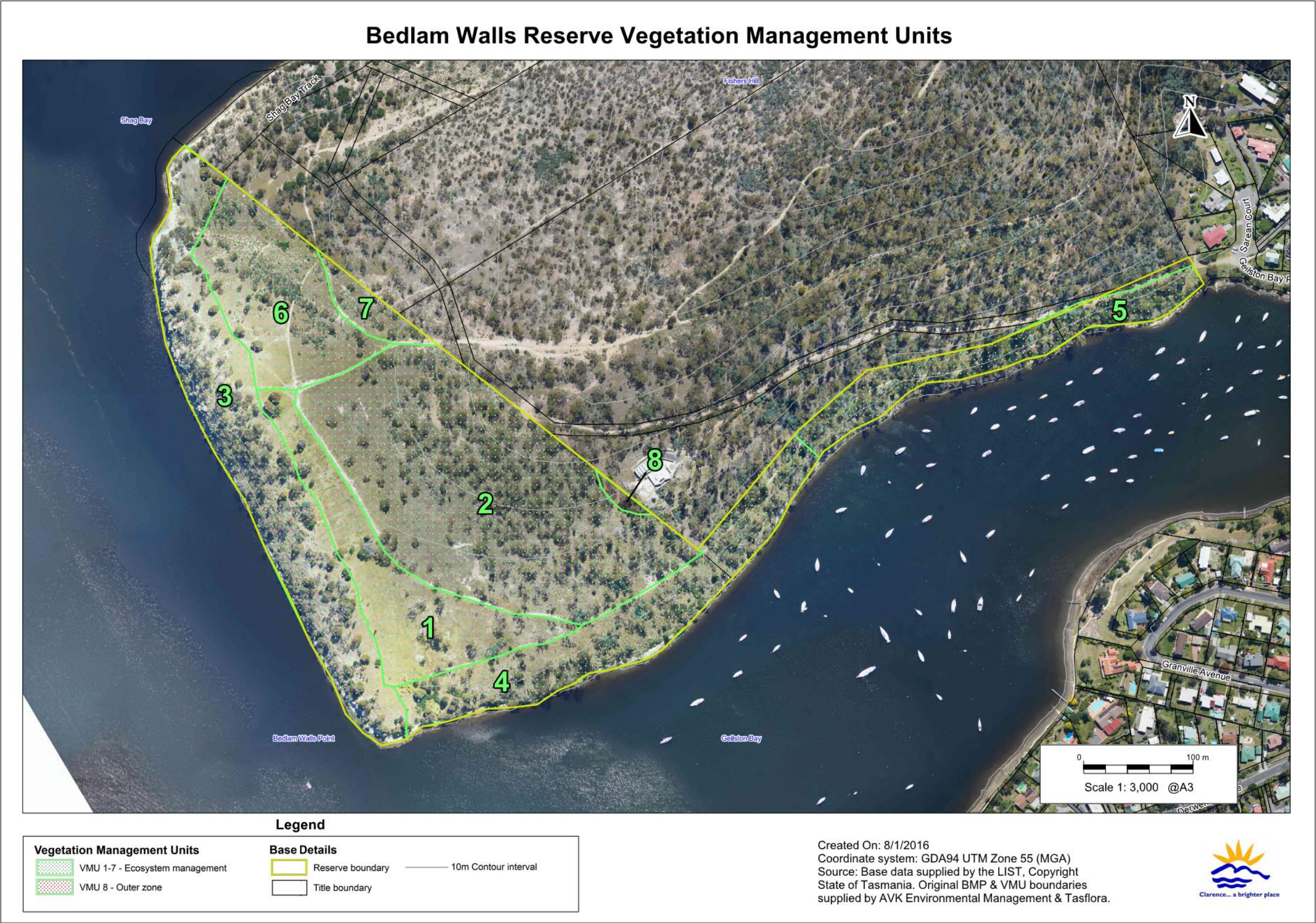
The approach adopted in this plan is to use planned burning primarily for habitat management. However, burning for habitat management will have the additional benefit of reduced bushfire hazard for a period following each bushfire.

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



Figure 7 – Vegetation management units in the reserve





**Table 9 – Bushfire management in the reserve**

VMU <sup>1</sup>	AREA (ha)	BUSHFIRE MANAGEMENT OBJECTIVES and PRESCRIPTIONS	NOTES and PRECAUTIONS <sup>2, 3, 4</sup>	LAST BURNT	NEXT BURN
1 GTL DVG	1.7	<p>OBJECTIVES:</p> <p>Maintain native grassland structure and floristics.</p> <p>Reduce introduced grasses and remove gorse.</p> <p>Maintain groundcover to reduce erosion.</p> <p>PRESCRIPTION:</p> <p>Autumn burn every 5 to 10 years.</p>	<p>Do not burn during the bird nesting/seed setting period.</p> <p>Ensure Aboriginal heritage sites are not damaged.</p> <p>Protect old quince trees during burns.</p>	April 2011	Assess next plan
2 DAM GTL	5.1	<p>OBJECTIVES:</p> <p>Maintain grassy woodland structure and floristics.</p> <p>Maintain groundcover to minimise erosion.</p> <p>Allow recruitment of canopy species.</p> <p>Burn only if natural recruitment of canopy species is not occurring.</p> <p>PRESCRIPTION:</p> <p>Autumn burn every 5 to 10 years.</p>	<p>Avoid burning within the power line easement.</p> <p>Contains the threatened plant species <i>Rytidosperma indutum</i> <sup>4</sup>. Obtain a permit from DPI/PWE Threatened Species Section before burning.</p> <p>Do not undertake broadscale burns during the bird nesting/seed setting period.</p> <p>Protect adjoining property during burns.</p> <p>Ensure Aboriginal heritage sites are not damaged.</p>	Not known	Assess next plan
3 DVG NBA NAV GTL	3.1	<p>OBJECTIVES:</p> <p>Maintain grassy woodland structure and floristics.</p> <p>Burn only if natural recruitment of canopy species is not occurring.</p> <p>Remove gorse.</p> <p>PRESCRIPTION:</p> <p>Autumn burn every 5 to 10 years.</p>	<p>Avoid burning within the power line easement.</p> <p>Do not undertake broadscale burns during the bird nesting/seed setting period.</p> <p>Ensure Aboriginal heritage sites are not damaged.</p>	2003 (Part)	Assess next plan
4 DAM NBA NAV DVG	3.0	<p>OBJECTIVES:</p> <p>Maintain grassy woodland structure and floristics.</p> <p>Remove gorse.</p> <p>PRESCRIPTION:</p> <p>Patch burn areas adjacent to walking track with dense <i>Lomandra</i> sp. Avoid areas with eucalypt regen until 3m in height or able to withstand adjacent patch burning.</p>	<p>Contains the threatened plant species <i>Rytidosperma indutum</i> <sup>4</sup>. Obtain a permit from DPI/PWE Threatened Species Section before burning.</p> <p>Do not burn during the bird nesting/seed setting period.</p> <p>Protect old quince trees during burns.</p> <p>Protect adjoining property during burns.</p> <p>Ensure Aboriginal heritage sites are not damaged.</p>	2012 (part)	Patch burn as required

VMU <sup>1</sup>	AREA (ha)	BUSHFIRE MANAGEMENT OBJECTIVES and PRESCRIPTIONS	NOTES and PRECAUTIONS <sup>2, 3, 4</sup>	LAST BURNT	NEXT BURN
5 DGL <sup>2</sup> NAV	1.1	<p>OBJECTIVES:</p> <p>Maintain shrubby woodland structure and floristics.</p> <p>Burn only if natural recruitment of canopy species is not occurring.</p> <p>PRESCRIPTION:</p> <p>Exclude bushfire for the next 5 years.</p>	<p>Consult DPIPWE Threatened Species Section before burning. Contains DGL<sup>2</sup></p> <p>Maintain burns at low intensity to minimise canopy scorch.</p> <p>Protect adjoining property during burns.</p> <p>Ensure Aboriginal heritage sites are not damaged</p>	2003 (part)	Assess next plan
6 DAM GTL	1.7	<p>OBJECTIVES:</p> <p>Maintain grassy woodland structure and floristics.</p> <p>Remove gorse.</p> <p>Burn only if natural recruitment of canopy species is not occurring.</p> <p>PRESCRIPTION:</p> <p>Exclude bushfire for the next 5 years.</p>	<p>Avoid burning within the power line easement.</p> <p>Do not burn during the bird nesting/seed setting period.</p> <p>Ensure Aboriginal heritage sites are not damaged.</p>	2002 (part) 2003 (part)	Assess next plan
7 DAM	0.3	<p>OBJECTIVES:</p> <p>Maintain grassy woodland structure and floristics.</p> <p>Burn only if natural recruitment of canopy species is not occurring.</p> <p>PRESCRIPTION:</p> <p>Exclude bushfire for the next 5 years.</p>	Do not burn during the bird nesting/seed setting period.	2006 (part)	Assess next plan
8 DAM	0.06	<p>OBJECTIVE:</p> <p>Maintain as an outer zone to protect adjoining dwelling.</p> <p>PRESCRIPTION:</p> <p>See specifications for outer zones in MP 5 in the Best Management Practices Guidelines.</p>	Consult with resident at 76 Geilston Bay Road prior to operations.	Not known	As required

<sup>1</sup> TASVEG 3.0 codes of vegetation types in the unit.

<sup>2</sup> Nature Conservation Act 2002

<sup>3</sup> Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

<sup>4</sup> Tasmanian Threatened Species Protection Act 1995

### 4.3.3 Preparation and Supervision

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

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

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

## 4.4 Bushland Management

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

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

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

In general, plantings should not be allowed:

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

Evidence of sheet erosion has been observed in the reserve, particularly in the northern portion. This seems to be due to a combination of poor soils, disturbance during construction of the power lines, heavy grazing by rabbits and marsupials, and burning. A reduction in grazing pressure and bushfire frequency would assist recovery.

## 5. Bushfire Management Recommendations

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

- URGENT** - Actions required to reduce a very high risk to life or property.
- ESSENTIAL** - Actions required to improve safety, or inadequate bushfire protection measures in high risk areas.
- Actions that are essential for control & suppression of bushfires, and/or conservation of threatened species.
- RECOMMENDED** - Actions required to improve inadequate bushfire protection measures in moderate risk areas.
- Actions required to ensure on-going effective bushfire management, or conservation of biodiversity.
- ROUTINE** - Maintenance of bushfire control resources and protection measures.

Urgent actions need to be undertaken as soon as possible.

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

- A** - Inspect and maintain annually, or as specified in the relevant MP
- A/S** - Timing as specified in the bushfire management plan
- 1, 2, etc.** - Carry out action within the time period specified (years)
- 1A, 2A etc.** - Construct within the next 1, 2 etc. years and then inspect and maintain annually, or as specified in the relevant MP.

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

## 5.1 Management Action Summary

RECOMMENDED ACTION	OBJECTIVE (section 3.1)	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, reserve users and other interest groups.  Reduction in the incidence of illegal fires on and around the reserve.
2) Implement the bushfire protection measures in section 2.4, for protection of assets in and around the reserve.	1, 4	E	Clarence City Council Fire and Bushland Management  Private landowners	Bushfire protection measures for adjoining dwellings implemented and maintained.  No assets lost to fires originating in, or moving through, the reserve.
3) Erect appropriate signs on tracks and roads to warn reserve users of planned burns.	1	E	Clarence City Council Fire and Bushland Management	No users of the reserve injured by planned burns.
4) Ensure that authorities planning bushfire control operations in the reserve are aware of the location of cultural heritage assets, and ensure they are not damaged by machinery movement or other activities.	4	REC	Clarence City Council  Tasmania Fire Service	No cultural heritage assets damaged during bushfire management or control operations in the reserve.
5) 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.



RECOMMENDED ACTION	OBJECTIVE (section 3.1)	PRIORITY	RESPONSIBILITY	PERFORMANCE INDICATORS
6) Ensure all fire trails shown on figure 6 on Council land are inspected and maintained in a trafficable condition at all times according to table 8 and MP 2.	2, 4	ROU - A	Clarence City Council Fire and Bushland Management	Fire trail repair works listed in table 9 completed.  Access routes maintained in a trafficable condition for fire service vehicles.
8) Inspect gate regularly to ensure that lock is 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. Ensure resident at 76 Geilston Bay Road is notified prior to Council access to reserve.	2	ROU - A	Clarence City Council Fire and Bushland Management  Tasmania Fire Service	No unauthorised use of fire trails in the reserve.  Continued positive relations with resident at 76 Geilston Bay Road.
9) 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.
10) Consult with the DPIPWE Threatened Species Section when carrying out bushfire management activities that may affect populations of threatened flora or fauna.	3	E	Clarence City Council Fire and Bushland Management  DPIPWE Threatened Species Section	All planned burns carried out according to the requirements of threatened flora and fauna.  All required permits obtained before burns or other management activities likely to affect threatened species.
11) 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.

RECOMMENDED ACTION	OBJECTIVE (section 3.1)	PRIORITY	RESPONSIBILITY	PERFORMANCE INDICATORS
12) 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.	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.
13) Regularly revise burning schedules and prescriptions to ensure they incorporate the most recent information on the fire ecology of flora, fauna and plant communities of conservation value in the reserve.	3, 5	REC - A/S	Clarence City Council Fire and Bushland Management	Bushfire management plan revised every 5 years.
14) Treat any weeds in areas to be burnt under this BMP according to MP 8. Ensure follow-up weeding is carried out after planned burns and Bushfires.	3, 5	REC - A/S	Clarence City Council Fire and Bushland Management	Pre- and post-fire weed control carried out in any weed infested VMUs burnt under this plan. Minimal coppicing or regrowth of weeds from treated rootstock.  All declared noxious weeds removed, reduction in extent of other weeds.
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.
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	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

- 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*
- 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.
- 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.
- 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.
- 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., Gilfedder L., and Fensham R., (1988) *City Parks & Cemeteries: Tasmania's Remnant Grasslands and Grassy Woodlands*. Tasmanian Conservation Trust, Hobart.
- 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.
- 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, Parks 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
- Sharples C. (1994) Geology and Geomorphology of the City of Clarence. In de Gryse J. (1995) *City of Clarence Natural Assets Inventory*, unpublished report to the 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.
- Tasmanian Fire Service. (2015). *Bushfire Survival Plan 2015-2016*. Tasmanian Fire Service, Hobart.
- Vertebrate Advisory Committee (1994) *Native Vertebrates which are Rare or Threatened in Tasmania. Edition 1. Species at Risk, Tasmania - Vertebrates*. Parks and Wildlife Service, Tasmania.



# Appendix A

Implementation of the previous bushfire management plan

The following codes have been used in assessing implementation of the previous Bushfire Management Plan for Bedlam Walls 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 assets in and around the reserve.	PI	Power line easement is being maintained.  No fires within reserve during previous BMP.  TFS familiarisation with midden sites still to be carried out.
3) Erect appropriate signs on tracks and roads to warn reserve users of planned burns.	IS	Signage erected when gorse burnt during previous BMP.
4) Ensure that authorities planning bushfire control operations in the reserve are aware of the location of cultural heritage assets, and ensure they are not damaged by machinery movement or other activities.	NI	TFS familiarisation with midden sites still to be carried out.
5) Implement the recovery procedures in MP 12 following planned burns and bushfires.	IS	Recovery methods implemented post burning of gorse during previous BMP.
6) Ensure all fire trails shown on figure 5 are inspected and maintained in a trafficable condition at all times according to table 8 and MP 2, and fire trail signs are in place and legible.	PI	Section of fire trails on Council land has been maintained.
7) Negotiate an agreement with the landowners along the route of BW1 to allow continued vehicle access to the reserve for management and firefighting.	PI	Restricted access has been confirmed. Permanent access agreement yet to be finalised.

RECOMMENDED ACTION	CODE	COMMENT
8) Inspect gates regularly to ensure that locks are in place and functioning. Ensure that the local Tasmania Fire Service Brigade and other emergency services have keys to the gates on trails giving access to the reserve.	NA	Currently the only gates on trails leading to the reserve are on private property.
9) Conduct a familiarisation tour of the reserve for local TFS brigades prior to the start of the fire permit period each year.	NI	TFS familiarisation still to be carried out.
10) Consult with the DPIPWE Threatened Species Section when carrying out bushfire management activities that may affect populations of threatened flora or fauna.	IS	No threatened species in locations of management activities during previous BMP.
11) Avoid burning the whole of any population of a threatened or rare plant species in a single bushfire.	NA	No fires within reserve during previous BMP.
12) Carry out vegetation monitoring as detailed in section 5.10 of the Bushfire Management Strategy including the recovery of any populations of threatened or rare flora and fauna burnt by bushfires or planned burns.	NI	Vegetation monitoring has not been established.
13) 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	No planned burning during previous BMP. Schedule revised during review process.
14) Treat any weeds in areas to be burnt under this BMP according to MP 8. Ensure follow-up weeding is carried out after planned burns and bushfires.	IS	Follow up weeding carried out at gorse site that was burnt during previous BMP.
15) Coordinate bushfire management, weed management and other management activities using the procedure in MP 9.	IS	No planned burning during previous BMP. Communication between stakeholders has occurred.
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	Council Fire and Bushland Crew have had ongoing training throughout duration of previous BMP.
17) Record bushfire management activities and bushfires using the procedures in MPs 10 and 11.	IS	No fires within reserve for duration of previous BMP. During 2014/2015 Council have created extensive Geographical Information System (GIS) for fire and bushland data storage.

# Appendix B

**Summary of community concerns and comments  
in the initial round of community consultation**



COMMUNITY CONCERNS and COMMENTS	COUNCIL'S COMMENT
Concern over fuel loadings between walking track and water's edge along VMU 4 and 5 from Geilston Bay Road entrance.	Explained that patch burning will be incorporated into burning regime for respective VMU's in reviewed BMP.
Concern about the bushfire hazard in the bushland at the rear of 4 Sarean Court.	Explained that this bushland was on private property and wouldn't be covered in the bushfire management plan, however residents could ask Council's hazard abatement officer to inspect the area and issue a hazard abatement notice on the landowner if required.
Question asked about fire behaviour in open grasslands/woodlands within reserve.	Discussed fire behaviour would be influenced by slope, fuel loading, and weather conditions on day. Discussed sections with open canopies will not be able to withstand crown fire.