PURPOSE AND SCOPE

To undertake a strategic bushfire risk analysis for Tasmania, where the methodology moves from a post-event analysis to a landscape risk assessment, using scenario-based modelling tools.

Through this analysis, articulate recommendations for a strategic fuel management program.

The analysis in this report takes a tenure-blind approach, and has been undertaken at a landscape level to test strategies designed primarily to reduce the risk of bushfire impacting on Human Settlement Areas.

Included in the report is:

- Analysis of particular issues associated with fuel mitigation activities.
- Bushfire risk assessment at the Statewide scale, including identification of communities considered to be at highest risk.
- Analysis of fuel reduction burning as the primary risk treatment option.

This report does not include:

- Alternative risk treatment strategies, including but not limited to fire prevention, building location, building standards, garden establishment and maintenance, mechanical fuel treatment and bushfire response measures.
- Locally specific analysis of location and maintenance of fire breaks and trails.
- A cost benefits analysis of different fuel reduction strategies.
- Recommendations for planned burning operations associated with forest practices or ecological health.
- Recommendations regarding the broader issues of bushfire preparedness and bushfire response.
- Risk assessment sub-Fire Management Area (FMA) scale, except for the identifications of communities considered to be at highest risk.

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REPORT CONTEXT

On 7 February 2009 widespread and devastating bushfires in Victoria resulted in the death of 173 people. The Victorian Government established the Victorian Bushfires Royal Commission (VBRC) to inquire into the circumstances of these deaths and to recommend any necessary improvements to fire management in Victoria (Teague, et al., 2010). 67 recommendations were made, and all but two of these recommendations were accepted by the Government. Of particular interest to this report, was Recommendation 56, that 'The State fund and commit to implementing a long-term program of prescribed burning based on an annual rolling target of 5 per cent minimum of public land' (Teague, et al., 2010). This recommendation was made on the recognition of fuel reduction as a proven method to reduce the rate of spread and intensity of fires, minimising their damage and making suppression easier for firefighters.

On 28 September 2010 the then Premier of Tasmania, David Bartlett, announced that in response to the VBRC, the Tasmanian Government fully supported 48 of the 67 recommendations, supported a further 17 in-principle and did not support two. Of the VBRC recommendations supported in principle, the Government agreed that further detailed consideration be given to the application in Tasmania of VBRC Recommendation 56.

Subsequently, the Minister for Police and Emergency Management asked the SFMC to give detailed consideration to the value in both a qualitative and quantitative sense of prescribed burning programs that were then being undertaken or proposed to be undertaken in Tasmania. Council was also asked to report on their capacity to support a program of long-term data collection to monitor and model the effects of prescribed burning programs and bushfires on biodiversity in Tasmania. A Cabinet Briefing prepared by SFMC provided advice to Cabinet in March 2011 outlining a program by which a burning target of 5% of treatable fuels on public lands could be achieved, through a considerably expanded program over 5 years, coordinated over multiple agencies. Such an expanded program also required legislative amendments to enable the restructuring of Fire Management Area Committees (FMACs). Cabinet deferred a decision on the minute. Tasmania had no Strategic Fuel Management Plan to address Recommendation 56, or other complex issues surrounding fuel management on private land tenures. Nor had there been testing of the validity of a blanket target of burning 5% of public land as a single strategy to reduce risk.

Instead, an alternative approach was followed with legislative amendments to the *Fire Service Act 1979* providing for an enhanced and expanded role for SFMC and for FMACs. In addition a Strategic Fuel Management Project was established to test fuel management targets based on a comprehensive understanding of bushfire risk for Tasmania, on all lands not just public lands, and make recommendations for a Strategic Fuel Management Program. It should also be noted that, since the VBRC, the Final Report of the Bushfires Royal Commission Implementation Monitor advocated that the Victorian Government reassess the 5% rolling target as the primary measure of risk reduction, emphasising that the primary focus of the fuel reduction burning program should be for community protection (State of Victoria, 2012).

Tasmania experienced its own devastating fires in January 2013 with significant loss of property and community impact. The then Tasmanian Government established the Tasmanian Bushfires Inquiry. The Inquiry made 103 recommendations including:

Recommendation 92: That the Government actively support the timely development and implementation of an ongoing Strategic Fuel Management Plan.

Recommendation 93: That the Strategic Fuel Management Plan includes measurable targets and they are actively monitored and reported on to the community.

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The analysis being undertaken in this report responds to these specific recommendations. In addition to fulfilling the Government commitment to the VBRC and the Tasmanian Bushfires Inquiry, this report also addresses the bushfire hazard management priorities identified in the Tasmanian State Natural Disaster Risk Assessment (2012). In particular, it looks at developing and strengthening the strategic approach to bushfire fuel reduction activities and evaluating the impact of recently implemented bushfire risk mitigation measures on the state bushfire risk assessment.

This report contains a thorough assessment of bushfire risk across Tasmania and assesses the benefits of different fuel reduction strategies using a number of different targets and approaches. Overall, it is demonstrated that the existing levels of planned burning being undertaken in Tasmania do need to be increased substantially to significantly decrease bushfire risk to Tasmanian communities. This report outlines the different approaches that could be taken, details the methodology used to undertake that assessment, and outlines some of the challenges for implementation of a much expanded program of planned burning.

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BACKGROUND

Fire is a fundamental part of the Australian environment, and has been significant in shaping the distribution of much of Australia's flora and fauna. Our nation is a fire-prone land, and along with many parts of the world, there has been an increase in the occurrence, intensity and damage caused by bushfire particularly in the last decade.

These fires have caused significant loss of life and psychological damage to communities, as well as loss of property, infrastructure and local economies. This has occurred against a background of a changing climate, an increasingly urbanised population, encroachment of infrastructure and habitation into bushland areas, and differing expectations and understanding of bushfire risk management (Bowman, 2003).

LAND TENURE

Broadly, the land tenure in Tasmania can be divided into 4 main areas: crown, reserved, forestry and private freehold. As seen in Figure 1, approximately 42% of the state is private land, 16% is Permanent Timber Production Zone Land managed by Forestry Tasmania (FT), 3% is Crown land (which has mixed management including the Department of Defence) and the remaining 39% is reserve managed by the Parks and Wildlife Service (PWS).

FIRE IN THE ENVIRONMENT

Fire is a fundamental aspect of the Australian environment, with many vegetation types requiring periodic fire to maintain ecological values. Much of the Australian vegetation is flammable and has a known ecological response, with fossil data indicating a very long history of fire on the continent pre-dating the arrival of humans (Scott *et. al.* 2014). South-eastern Australia, including Tasmania, is particularly prone to fire and is regarded as one of the most bushfire-affected regions in the world (Hennessy, et al., 2006).

Fire forms an important part of the environment and remains essential for biodiversity and renewal. When uncontrolled though, its effects can be catastrophic. Fires may occur under conditions that threaten human life and property, may be too frequent, too intense, cause temporary reductions to air quality or disruptions to the public. The Tasmanian State Natural Disaster Risk Assessment (TSNDRA) identifies both bushfire and flood as the most significant hazard risk types. Bushfire is the most costly natural disaster hazard in Tasmania's history, in both economic and human terms. It has claimed the most lives and has previously been estimated to carry an average annual cost of $11.2 million (Bureau of Transport Economics, 2001).

As outlined in the *National Bushfire Policy Statement for Forests and Rangelands (2012)* the complexities of different ecosystems, community values and land use history means that policies and procedures with regards to bushfire management need to reflect regional needs and priorities.

FIRE HISTORY IN TASMANIA

It is not the purpose of this report to provide a thorough analysis of the fire history of Tasmania. A more comprehensive analysis of Tasmania's fire history can be found in Part B of the 2013 Tasmanian Bushfires Inquiry Report, and only summary information will be presented in this section.

The last decade has seen several major bushfires in southern Australia. These include the 2003 Canberra and alpine fires in NSW, ACT and Victoria, the 2005 Wangary fire on the Eyre Peninsula in

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South Australia, the 2006/07 Great Divide fires in Victoria, the February 2009 fires in Victoria, the Perth hills fires of 2011 and 2014, and the Blue Mountains fires of October 2013.

Major fires have also occurred in Tasmania, particularly in the last decade (Figure 2). In January 2013, Tasmania experienced its worst bushfires since 1967 fires, with many thousands of hectares burned, community infrastructure lost and over 200 buildings destroyed. The Upper Derwent Valley has been particularly hard hit, with large fires in 2010, 2012 and 2013 resulting in both the loss of property, forestry values and agricultural areas. The 1967 fires though remain the most destructive in Tasmanian history, when over a five hour period 62 people died, approximately 1400 buildings were destroyed and 265 000 hectares burnt (Luke & McArthur, 1978).

Projections from climate change models suggest that in the next few decades across much of south eastern Australia there will be major increases in the level of fire threat through increases in the incidence of high fire danger conditions. Climate change projections using a downscaled model for Tasmania suggest an overall increase in bushfire risk related to an increase in the number of high fire danger days (White, et al., 2010). This potential for the next century is based on projections showing increases in hot days and warm nights; dry days and longer dry spells; more warm spells and heat waves; and more wet days, but fewer cold spells and cold waves (which could potentially contribute to increases in fuel accumulation). The number of total fire ban days occurring each summer has also started to increase, as well as increases in lightning caused ignitions.

PLANNED BURNING

Fuel reduction burning, or planned burning, is a recognised technique for reducing the rate of spread and intensity of fires, for minimising the damage caused by bushfires, and to provide fire-fighters with safe opportunities to contain and extinguish future fires. Burning is still considered the most cost-effective tool available for managing broad areas of vegetation fuel loads in the landscape.

In Tasmania only certain types of vegetation are suitable for planned burning, for example, dry eucalypt forest, scrub, heathland and button grass. These are what can be called ‘treatable’ vegetation types. Vegetation such as rainforest, wet eucalypt forest and alpine vegetation is not suited to fuel reduction burning for both practical and environmental reasons. Agricultural lands, whilst certainly susceptible to the impact of bushfire, are also not considered “treatable” due to the land use priority for these vegetation types. This does not preclude these areas from burning, however it means this area of land is not being included in the analysis.

Figure 3 shows the arrangement of treatable, non-treatable and agricultural lands across the state, based on TASVEG 3.0 and land use mapping as described in the methodology of this report.

The treatable vegetation is spread over different tenure as follows:

- 0.97 million hectares (39%) in reserves (PWS);
- 0.39 million hectares (16%) in Permanent Timber Production Zone Land (FT);
- 0.08 million hectares (3%) on unallocated Crown lands; and
- 1.05 million hectares (42%) on privately owned and other lands.

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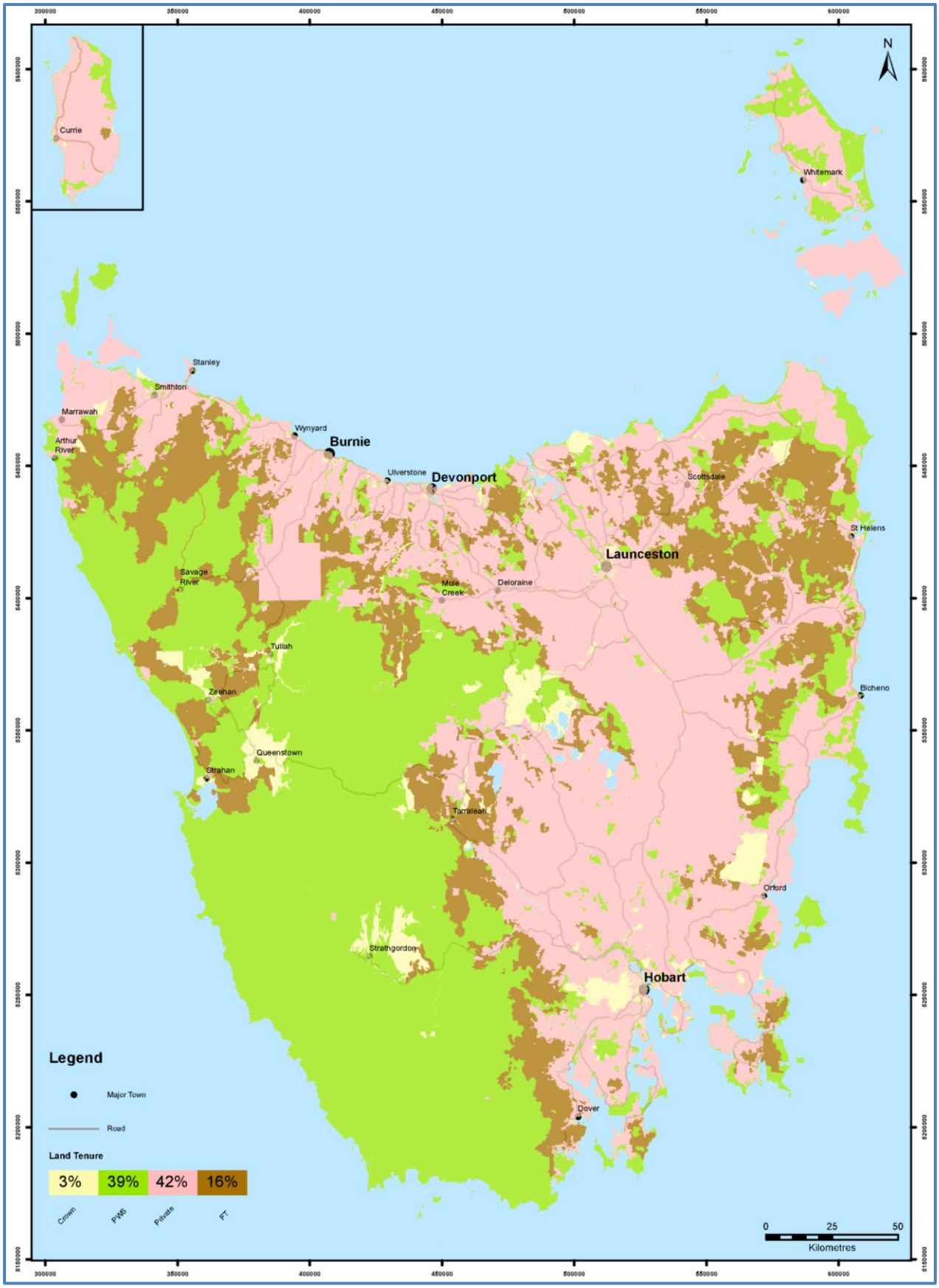

Figure 1: Broad categories of land tenure

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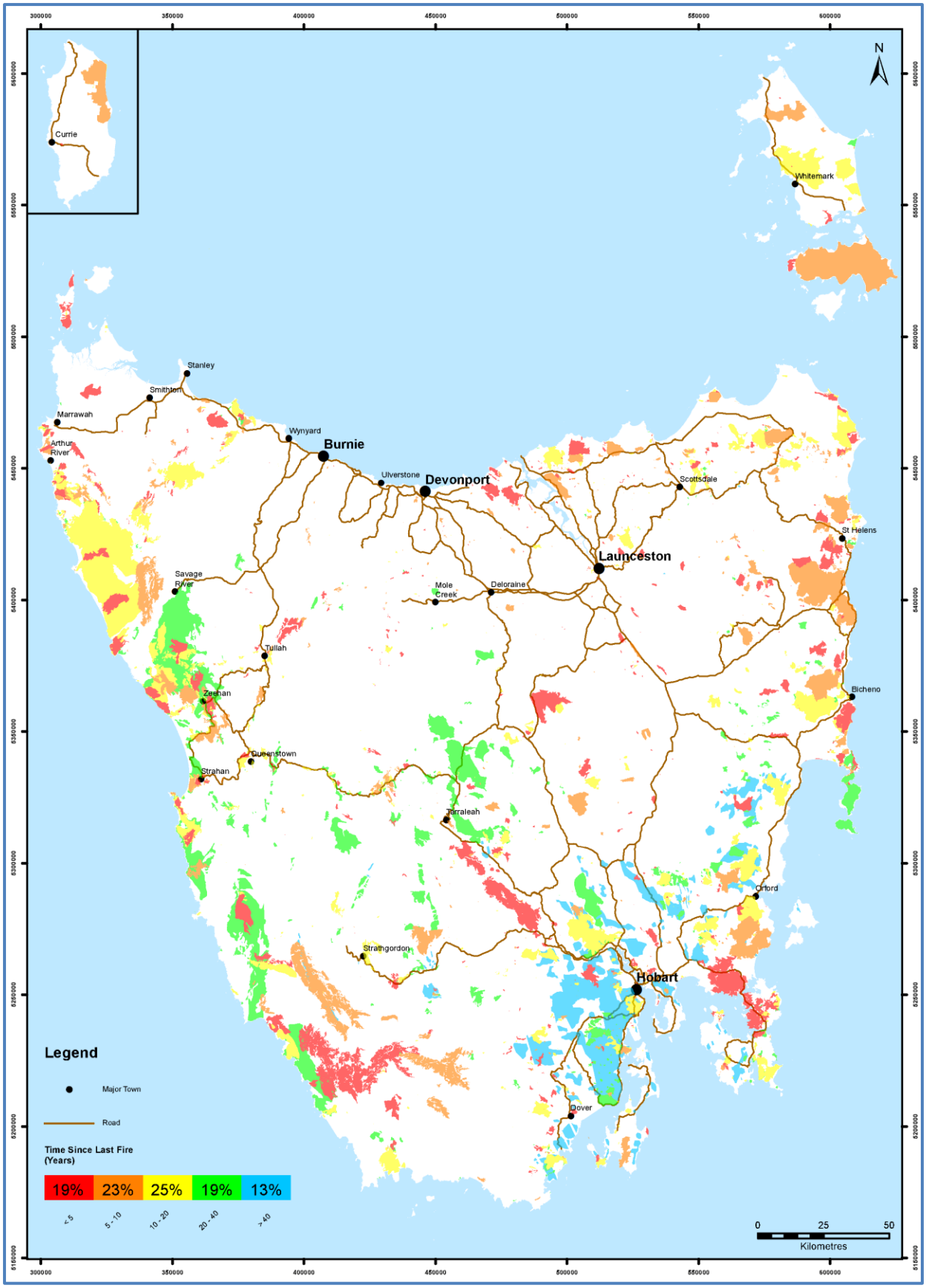

Figure 2: Time since last fire in years, up until June 2013.

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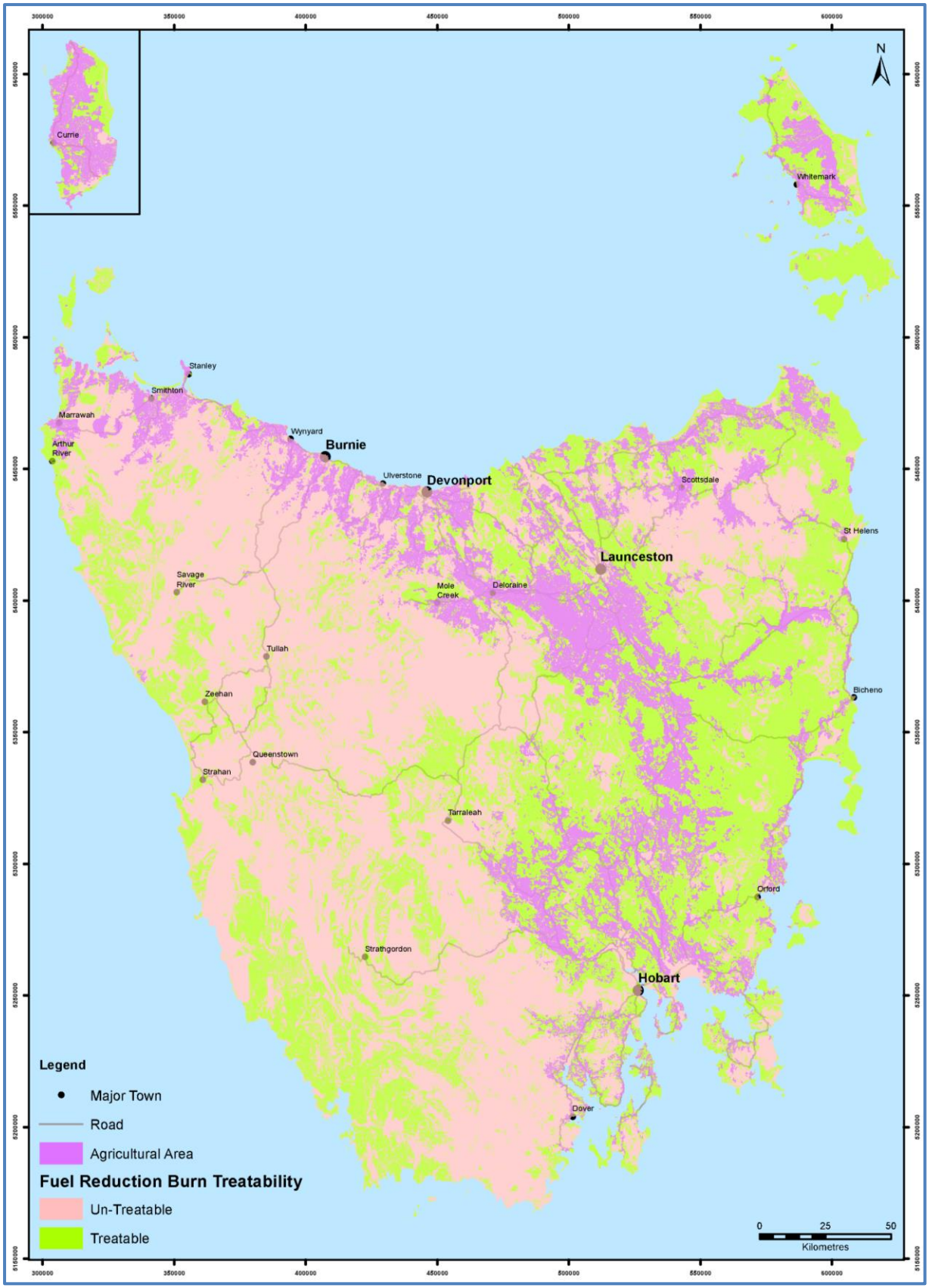

Figure 3: Treatable fuels across Tasmania

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Burning Effort Over the Past Five Seasons

The majority of planned burning is currently undertaken on public land. Both Forestry Tasmania and the Parks and Wildlife Service keep records of all the burning they undertake, and only fuel reduction burns have been included in this analysis. Burning on private land is under-reported, and where known private land burns have been included in the analysis however the records are quite incomplete. During the permit period fire size is estimated as part of the permit, however outside the permit period, fire registration is not mandated. The permit information also includes those circumstances where both Parks and Wildlife and Forestry Tasmania require permits, so using the total burn area indicated in permits doubles up some of the reporting for public land burning.

Planned burning is highly dependent on the right weather conditions and available resources to maximise opportunities when they arise. If there is a busy fire season leading into the autumn burning window, this can also diminish the amount of burning that is completed, due to crew fatigue and some still being deployed in response operations. Table 1 summarises the past five years of planned burning, as recorded in the fire history database. As can be seen in this summary, weather conditions over the 2010-2011 season were particularly favourable, and both Forestry Tasmania and the PWS achieved a significant number of burns in that year.

Table 1: Planned Burns Completed, And Total Area Expressed As A Percentage Of Treatable Fuels Over The Past Five Years.

Season	Number of burns	Number of Hectares	% of Total Treatable
2008 2009	36	8,776	0.35%
2009 2010	47	10,597	0.42%
2010 2011	70	39,429	1.58%
2011 2012	37	7,308	0.29%
2012 2013	38	16,123	0.64%
Total	**228**	**82,233**	**3.28%**
Average	**45.6**	**16,447**	**0.66%**

It is easy to measure success simply in terms of a percentage target, but this oversimplifies the issue. Targets can be achieved by burning large areas in remote locations, achieving little to protect the community. Targets need to be based on how they address risks to communities, and this issue is addressed later in this report.

In recent years more effort has been concentrated on burns where real risk reduction can be achieved, and this has been seen in fuel reduction burns undertaken around Launceston, St Helens, and Bicheno. These burns closer to communities are more resource hungry and tend to be smaller in size; however, they achieve a greater reduction in risk.

Fire Management in Tasmania

The agencies most closely involved in bushfire management in Tasmania are the Tasmania Fire Service, Forestry Tasmania and the Parks and Wildlife Service. An Inter-Agency Fire Management Protocol is signed each year that is effectively the operating agreement between the three agencies. The protocol underpins the cooperation that exists between the agencies to ensure the suppression and management of bushfire in Tasmania is safe, efficient and cost-effective. Through this arrangement there is collaboration in: training; identification of risk and mitigation; some planned burning operations; and, bushfire suppression.

In addition to the three main agencies, bushfire prevention and response activities are also undertaken by private land owners, companies (for example Norske Skog in association with their

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forest management practices), contractors, and some local governments (for example Hobart City Council). These groups are important partners in bushfire management in Tasmania, and particularly with the forest contractors, undertake the same training and use the same incident management systems for bushfire suppression.

STATE FIRE MANAGEMENT COUNCIL

The SFMC is an independently chaired body established under Section 14 of the *Fire Service Act* 1979. Membership is prescribed in the Act as follows:

- a person nominated by the Minister of Police and Emergency Management;
- the Chief Officer of the Tasmania Fire Service;
    - a nominee of the Chief Officer;
- the Chief Executive Officer of the Forestry corporation;
    - a nominee of the chief executive officer of the Forestry corporation;
- the Director of National Parks and Wildlife;
    - a nominee of the Director of National Parks and Wildlife;
- a person nominated by the Tasmanian Farmers' and Graziers' Association;
- a person nominated by the Forest Industries Association of Tasmania; and
- a person nominated by the Local Government Association of Tasmania.

SFMC has the following functions:

- to develop a State Vegetation Fire Management Policy (see Appendix 1) to be used as the basis for all fire management planning;
- to advise and report regularly to the Minister on such matters relating to the administration of *the Fire Service Act*, as it applies to vegetation fire management, either responding to Ministerial requests or bringing matters to the Minister's attention;
- to provide advice to the State Fire Commission regarding the prevention and mitigation of vegetation fires;
- to perform such other functions relating to the prevention or mitigation of vegetation fires as the Minister may direct; and,
- to provide an annual report to the Minister and the Commission on its activities (and that of its sub-committees) for inclusion in the annual report of the Commission.

Since the inception of SFMC administrative support has been provided by the TFS. However, there has been no policy development or project management capacity within the Council, beyond what members could take on in addition to their other responsibilities. In recent years, especially since the 2009 Victorian Bushfires Royal Commission, and the 2011 Auditor General Report into Bushfire Management (Tasmanian Audit Office, 2011; Teague, et al., 2010), the expectations of SFMC went beyond what Council could deliver, and the TFS has provided the necessary funding to support the development of this strategic bushfire risk assessment. Additional funds have also been provided by a grant through the Natural Disaster Resilience Program.

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FIRE MANAGEMENT AREA COMMITTEES

In 2012 amendments were made to the *Fire Service Act* 1979 that administratively aligned the responsibility for bushfire fuel management under SFMC. FMACs that previously reported to the State Fire Commission now report to the SFMC. FMAC membership has also been changed, to reflect broader strategic goals, and the committee boundaries changed to reflect that bushfire is a landscape scale problem.

There are 10 FMAs covering the state (see Figure 4), with boundaries based on bushfire risk and topography, largely aligning to local government boundaries. The focus of the FMACs is to prepare a fire protection plan for their FMA, through the identification and prioritisation of bushfire vegetation risks, and prioritisation of strategic works to mitigate these risks. The outputs of this report provide the necessary risk assessment, and results have been prepared at both the Statewide and FMA level.

These changes have only been implemented in the last 12 months, and all committees are still in the process of preparing their first fire protection plan, with the support of SFMC. The mitigation priorities developed through these plans should form the basis of a tenure blind bushfire risk mitigation program, which can be implemented on a priority basis using the same underlying assessment of risk.

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Figure 4: Fire Management Area Boundaries

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