

The Senate

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Environment and Communications  
References Committee

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Responses to, and lessons learnt from, the  
January and February 2016 bushfires in  
remote Tasmanian wilderness

December 2016

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# Committee membership

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Senator James Paterson, Deputy Chair (from 5 December 2016)	LP, VIC
Senator David Bushby, Deputy Chair (to 5 December 2016)	LP, TAS
Senator Anthony Chisholm	ALP, QLD
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Senator Linda Reynolds CSC, Deputy Chair	LP, WA
Senator Chris Back	LP, WA
Senator Joe Bullock (to 13 April 2016)	ALP, WA
Senator Anne McEwen (from 18 April 2016)	ALP, SA
Senator the Hon Lisa Singh	ALP, TAS
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# List of recommendations

## Recommendation 1

**2.45** The committee recommends that the Australian Government:

- recognise that climate change has increased fire conditions in south-eastern Australia and the risk to natural and cultural values in the Tasmanian Wilderness World Heritage Area; and
- report annually to the World Heritage Committee on the state of conservation in the Tasmanian Wilderness World Heritage Area.

## Recommendation 2

**3.38** The committee recommends that the Australian Government, in cooperation with the Tasmanian Government:

- recognise the need to identify the ecological and biodiversity impacts of fire on fire sensitive vegetation communities, organic soils and endemic fauna species in the Tasmanian Wilderness World Heritage Area; and
- allocate long-term funding to the Commonwealth Scientific and Industrial Research Organisation and/or the Tasmanian Government to assist with the development of fire assessment and modelling specifically suited to the Tasmanian Wilderness World Heritage Area.

## Recommendation 3

**4.98** The committee recommends that the Australian Government, in conjunction with state and territory governments, investigate a national remote area firefighting capability, to support Australian fire agencies.

## Recommendation 4

**4.100** The committee recommends that the Australian Government commit to long-term funding for the National Aerial Firefighting Centre of an amount that is at least equal to the government's current contribution, rising in line with the Consumer Price Index.

## Recommendation 5

**5.48** The committee recommends that the Australian Government recognise the need to enhance protection and conservation efforts in the Tasmanian Wilderness World Heritage Area by allocating increased funding:

- to the Parks and Wildlife Service, Tasmania, for appropriate management activities and resources; and
- for research projects aimed at providing qualitative and quantitative data specific to climate-related and ecological threats to the Tasmanian Wilderness World Heritage Area (such as dry lightning strike).

## **Recommendation 6**

**5.49** The committee recommends that the Australian and Tasmanian Governments:

- **develop options to increase co-operation to ensure that the Tasmanian Wilderness World Heritage Area is protected and conserved in line with Australia's obligations under the World Heritage Convention; and**
- **work together to ensure strong provisions to protect the Tasmanian Wilderness World Heritage Area from bushfire risks are included in the *Tasmanian Wilderness World Heritage Area Management Plan*.**

## Abbreviations

ADF	Australian Defence Force
AFAC	Australasian Fire and Emergency Service Authorities Council
AGD	Attorney-General's Department
AIA	<i>Arrangements for Interstate Assistance</i>
BNH CRC	Bushfire and Natural Hazards Co-operative Research Centre
BRAM	Bushfire Risk Assessment Model
COMDISPLAN	Australian Government Disaster Response Plan
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DEE	Department of the Environment and Energy
DPIPWE	Department of Primary Industries, Parks, Water and Environment (Tas)
EMA	Emergency Management Australia
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
NAFC	National Aerial Firefighting Centre
OUV	Outstanding Universal Value
PWS	Parks and Wildlife Service, Tasmania
TASVEG	Tasmania's layered vegetation map
TFS	Tasmania Fire Service
TWWHA	Tasmanian Wilderness World Heritage Area
UNESCO	United Nations Educational, Scientific and Cultural Organization



# Chapter 1

## Introduction and background

### Reference

1.1 On 17 March 2016, the Senate referred the following matter to the Environment and Communications References Committee (the committee) for inquiry and report by 30 May 2016:

The response to, and lessons learnt from, recent fires in remote Tasmanian wilderness affecting the Tasmanian Wilderness World Heritage Area, with particular reference to:

- (a) the impact of global warming on fire frequency and magnitude;
- (b) the availability and provisions of financial, human and mechanical resources;
- (c) the adequacy of fire assessment and modelling capacity;
- (d) Australia's obligations as State Party to the World Heritage Convention;
- (e) world best practice in remote area fire management; and
- (f) any related matter.<sup>1</sup>

1.2 On 8 May 2016, the Governor-General issued a proclamation dissolving the Senate and the House of Representatives on 9 May 2016 for a general election on 2 July 2016. As a result of the dissolution of the Senate, the committee ceased to exist and the inquiry lapsed.

1.3 The 45<sup>th</sup> Parliament commenced on 30 August 2016 and the committee was appointed on 31 August 2016.<sup>2</sup> On 13 September 2016, the Senate agreed to the committee's recommendation that the inquiry be re-adopted with the terms of reference unchanged and with a reporting date of 1 December 2016. The Senate agreed also that the committee have the power to consider and use the records of the Environment and Communications References Committee appointed in the 44<sup>th</sup> Parliament.<sup>3</sup>

1.4 The reporting date was subsequently extended to 8 December 2016.<sup>4</sup>

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1 *Journals of the Senate*, No. 148–17 March 2016, p. 3990.

2 *Journals of the Senate*, No. 2–31 August 2016, pp. 75–76.

3 *Journals of the Senate*, No. 5–13 September 2016, pp. 176–178.

4 *Journals of the Senate*, No. 23–1 December 2016, p. 753.

## **Conduct of the inquiry, acknowledgement and note on references**

1.5 In accordance with its usual practice, the Environment and Communications References Committee of the 44<sup>th</sup> Parliament advertised the inquiry on its webpage, and wrote to organisations and individuals, inviting submissions by 15 April 2016. The committee continued to receive submissions after this date. In total, the committee received 34 submissions, which are published on the committee's website and listed at Appendix 1.

1.6 In addition to the published submissions, the committee received nine form letters in relation to the inquiry. These were available to the committee throughout the inquiry but the form letters were not published as submissions.

1.7 The committee held public hearings in Canberra on 1 November 2016 and Launceston on 2 November 2016. A list of witnesses who appeared at the hearings is at Appendix 2 and the evidence received by the committee is available on the committee's website.

1.8 The committee thanks those organisations, individuals, departments and agencies that contributed to the inquiry.

1.9 All references in this report are to the proof *Hansard* and page numbers may vary between the proof and the official *Hansard*.

## **Structure of the report**

1.10 This chapter outlines the history and effect of the bushfires that occurred in the Tasmanian Wilderness World Heritage Area (TWWHA) in early 2016. The chapter particularly notes the vegetation types affected by the fires.

1.11 The following chapters examine:

- the impact of climate change on fire frequency and magnitude in the TWWHA (chapter two);
- the adequacy of the TWWHA's fire assessment and modelling capacity (chapter three);
- the financial, human and mechanical resources that were available and provided for the bushfires in the TWWHA (chapter four); and
- Australia's obligations under the Convention Concerning the Protection of World Cultural and Natural Heritage and world best practice in remote area fire management (chapter five).

## Tasmanian Wilderness World Heritage Area

1.12 The TWWHA covers approximately 1.6 million hectares, occupying almost one-quarter of Tasmania and encompassing four national parks.

**Figure 1.1: Tasmanian Wilderness World Heritage Area**



*Source: Parliamentary Library*

1.13 The TWWHA is one of the largest temperate natural areas in the southern hemisphere and is recognised as a World Heritage property for its Outstanding Universal Value (OUV). It contains significant natural and cultural heritage, including a wide range of plant communities (flora). Two-thirds of Tasmania's endemic higher plant species occur only in the TWWHA, and many species provide living evidence of the Gondwanan origin of the Tasmanian flora. Some species are representative of plant communities that once dominated mainland Australia.<sup>5</sup>

1.14 The Parks and Wildlife Service, Tasmania (PWS) describes the TWWHA as 'the Australian stronghold of cool temperate rainforest'. Some vegetation species in these forests date back over 60 million years and were once dominant components of the vegetation across the Australian continent (before the arrival of the eucalypts and acacias that now dominate the Australian flora). The ancestors of many rainforest species—such as myrtle-beech, native plum and leatherwood—evolved on the ancient continent of Gondwana. Many rainforest species are extremely fire sensitive and can take 400 years or more, in the absence of any further fires, to recover to their former glory after fire.<sup>6</sup>

1.15 According to the PWS, the TWWHA also hosts 'the most extensive and pristine areas of alpine vegetation in Australia'. The dominant species are shrubs, rather than the tussock grass and herb-dominant communities of the mainland Australian Alps. About 60 per cent of the alpine flora is endemic to Tasmania. These include such species as cushion plants, scoparia and Tasmania's only native deciduous species, the deciduous beech. This alpine environment is extremely fragile and susceptible to damage from fire.<sup>7</sup>

1.16 Most of Tasmania's unique conifers occur within the TWWHA: the second longest lived organism in the world, the Huon pine; and the sole representatives of the family *Taxodiaceae* to be found in the southern hemisphere, the endemic King Billy pine (*Athrotaxis selaginoides*), the Pencil Pine (*Athrotaxis cupressoides*) and their natural hybrid, *Athrotaxis laxifolia*. Like rainforest species, these conifers are highly susceptible to fire and in some areas, extensive stands of dead 'stags' bear testimony to the ravages of previous fires. Some species will never recover from burning.<sup>8</sup>

1.17 Moorlands are found throughout the TWWHA, with the sedge (buttongrass) being the dominant species. The buttongrass moorlands contain over 150 vascular plant species, a third of which are endemic to Tasmania. Buttongrass moorlands have a high frequency of fire and as a result, the acidic peat soil in which they grow is among the most nutrient poor in the world.<sup>9</sup>

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5 Parks and Wildlife Service, Tasmania (PWS), [World Heritage Values, Flora](http://www.parks.tas.gov.au/index.aspx?base=639), <http://www.parks.tas.gov.au/index.aspx?base=639> (accessed 11 November 2016).

6 PWS, World Heritage Values, Flora (accessed 11 November 2016).

7 PWS, World Heritage Values, Flora (accessed 11 November 2016).

8 PWS, World Heritage Values, Flora (accessed 11 November 2016).

9 PWS, World Heritage Values, Flora (accessed 11 November 2016).

1.18 The TWWHA also provides secure habitats for some of the most unique animals (fauna) in the world, as well as endangered species. Tasmania and the TWWHA have a high proportion of endemic fauna, including five species of mammal. Over half of the mammal species are a distinct subspecies from their mainland counterparts. The TWWHA is also home to the three largest carnivorous marsupials in the world: the Tasmanian devil; the spotted-tail quoll; and eastern quoll. Endangered species within the TWWHA include species that have recently become extinct or threatened on the mainland, and rare and threatened species within Tasmania—such as the orange-bellied parrot and the white goshawk.<sup>10</sup>

1.19 In addition to its flora and fauna, the TWWHA is recognised for its heritage values. These include: some of the richest and best preserved Indigenous sites in Australia dating back around 45000 years; an 'outstanding' example of one of the most significant features of world population movement in the 18<sup>th</sup> and 19<sup>th</sup> centuries (the Macquarie Harbour Historic Site); a profusion of complex and well-exposed geological features; and the most significant and extensive glacially modified landscapes in Australia.<sup>11</sup>

1.20 Further, the TWWHA is important to Tasmania's culture, identity and economy.<sup>12</sup> For example, in 2008 a report commissioned by the (then) Department of the Environment, Water, Heritage and the Arts estimated that Tasmania's World Heritage Areas contributed \$721.8 million in annual direct and indirect state output or business turnover, \$313.5 million in annual direct and indirect state value added, and 5372 direct and indirect state jobs.<sup>13</sup>

### **The 2016 bushfires and their estimated impact on the TWWHA**

1.21 Bushfires are a part of Australia's natural environment. Compared to the mainland, Tasmania has relatively infrequent fire weather and high intensity bushfires. However, these fires can occur throughout the fire season (December to March).<sup>14</sup>

1.22 In January to February 2016, Tasmania experienced a series of dry lightning strikes (commencing on 13 January). Fire authorities responded to 2350 incidents,

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10 PWS, [World Heritage Values, Fauna](http://www.parks.tas.gov.au/index.aspx?base=642), <http://www.parks.tas.gov.au/index.aspx?base=642> (accessed 11 November 2016).

11 PWS, [World Heritage Values](http://www.parks.tas.gov.au/index.aspx?base=7450) (Aboriginal Heritage, Historic Heritage, Geoheritage), <http://www.parks.tas.gov.au/index.aspx?base=7450> (accessed 11 November 2016).

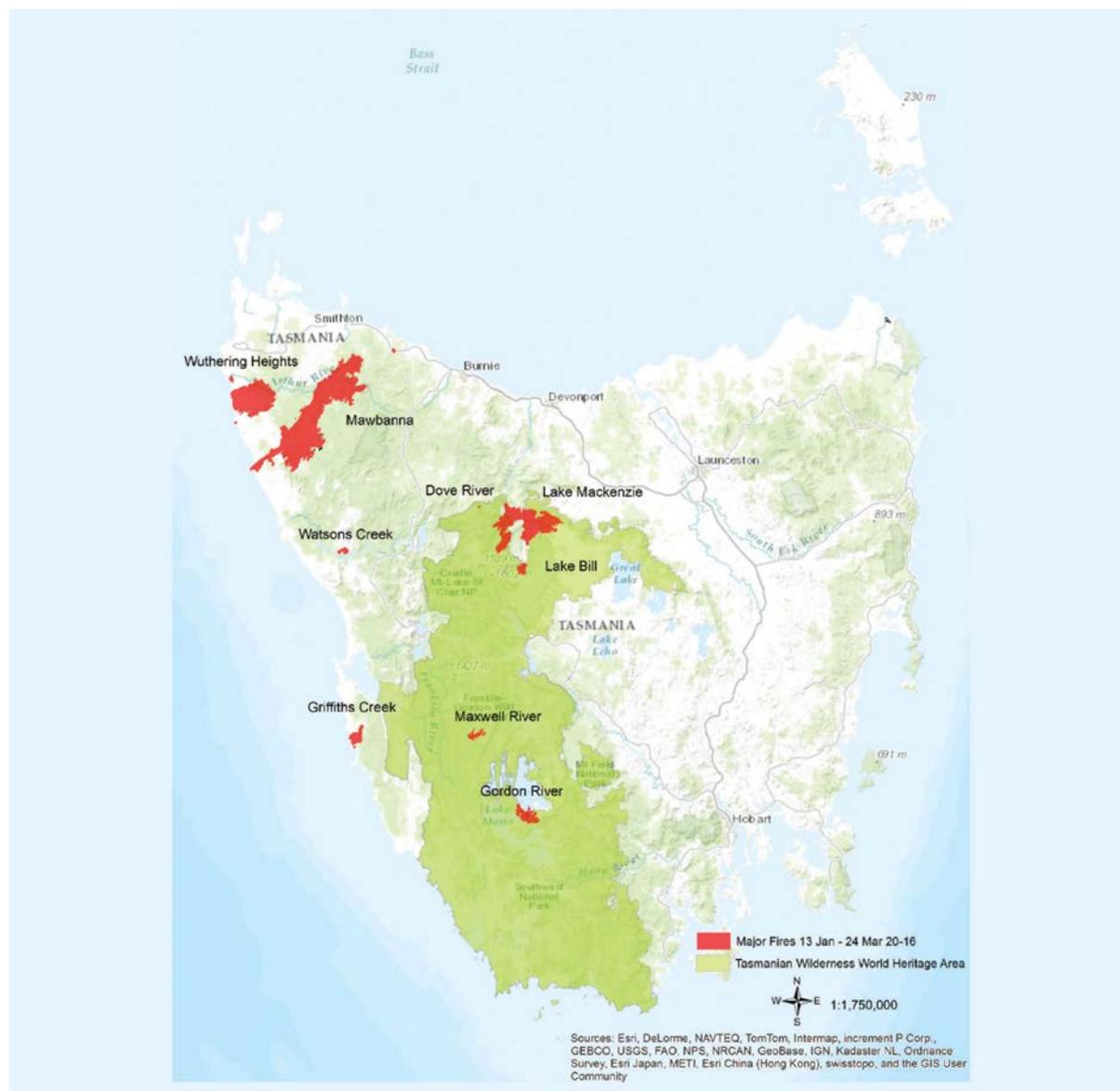
12 Australian Conservation Foundation, *Submission 20*, p. 2; Tasmanian Greens, *Submission 22*, p. 5.

13 Gillespie Economics and BDA Group, Economics and Environment, [Economic Activity of Australia's World Heritage Areas](https://www.environment.gov.au/system/files/resources/c890e9a0-6462-4412-8b74-14054966b8c0/files/economic-activity-summary.pdf), Report to the Department of the Environment, Water, Heritage and the Arts, Final Report, July 2008, p. 3, <https://www.environment.gov.au/system/files/resources/c890e9a0-6462-4412-8b74-14054966b8c0/files/economic-activity-summary.pdf> (accessed 11 November 2016).

14 Commonwealth Scientific and Industrial Research Organisation (CSIRO), *Submission 1*, p. 4; Dr Richard Thornton, Chief Executive Officer, Bushfire & Natural Hazards Cooperative Research Centre, *Committee Hansard*, Launceston, 2 November 2016, p. 20.

including 639 vegetation fires. Of these fires, eighteen affected the TWWHA, burning out approximately 19 936 ha (1.3 per cent).<sup>15</sup> The majority of the burnt area was at Lake Mackenzie (13 822 ha), Mt Cullen or Gordon River Road (3520 ha), and Maxwell River South (1389 ha).<sup>16</sup>

**Figure 1.2: Major fires in Tasmania, 13 January to 24 March 2016**



1.23 According to the Tasmanian Government, the majority of the burnt area was composed of vegetation types and fauna that are adapted, or resilient, to the effects of fire, and are therefore likely to recover to something similar to their original state.<sup>17</sup>

15 Tasmanian Government, *Submission 24*, pp. 7–8.

16 Department of the Environment and Energy (DEE), *Submission 23*, p. 4.

17 Tasmanian Government, *Submission 24*, p. 5. The submission notes that the burnt area on the Central Plateau also includes vegetation types and soils that are not fire-adapted.

### ***Vegetation with high ecological value***

1.24 The Tasmanian Government identified the Mersey Forest Complex fires on the alpine and sub-alpine vegetation around Lake Mackenzie as having the most significant potential impact to vegetation values in the TWWHA:

The most significant flora value affected is Pencil Pine (*Athrotaxis cupressoides*). This species is an iconic example of Gondwanic legacy in the TWWHA, identified under World Heritage Criteria (ix). It also contributes to the aesthetic importance of the alpine landscapes of the TWWHA identified under World Heritage Criteria (vii). The recovery of cushion moorlands, various alpine heathlands and sedgeland and alpine sphagnum peatlands will be dependent on the fire intensity and degree of organic soil loss.<sup>18</sup>

1.25 Pencil Pine is classified as a 'threatened native vegetation community' under the *Nature Conservation Act 2002* (Tas).<sup>19</sup> An estimated 141 ha of Pencil Pine forest and woodland are potentially impacted by the bushfires, representing 'approximately 0.6% of the mapped distribution of this species'.<sup>20</sup>

#### **Figure 1.3: Aftermath of bushfires, Lake Mackenzie**



**The largest remaining pencil pine forest growing in sphagnum, killed in the late stages of the fire south of Lake Mackenzie**

Source: Rob Blakers, *Submission 21*, p. 9.

18 Tasmanian Government, *Submission 24*, p. 5.

19 Other 'threatened native vegetation communities' potentially affected by the bushfires include: Highland Poa Grassland (624 ha); Highland Grassy Sedgeland (578 ha); and Sphagnum peatland (80 ha).

20 Tasmanian Government, *Submission 24*, p. 7. Similarly, the DEE estimated that the impact on Pencil Pines is less than two per cent: *Submission 23*, p. 4.

1.26 The fires are expected also to have affected geoconservation features (organic and mineral soils, karst and fluvial systems, wetland peats, cushion moors and sphagnum bogs).<sup>21</sup> Some of these—organic soils and karst systems—are recognised as part of the OUV of the TWWHA.<sup>22</sup>

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21 DEE, *Submission 23*, p. 4.

22 Tasmanian Government, *Submission 24*, p. 5.

# Chapter 2

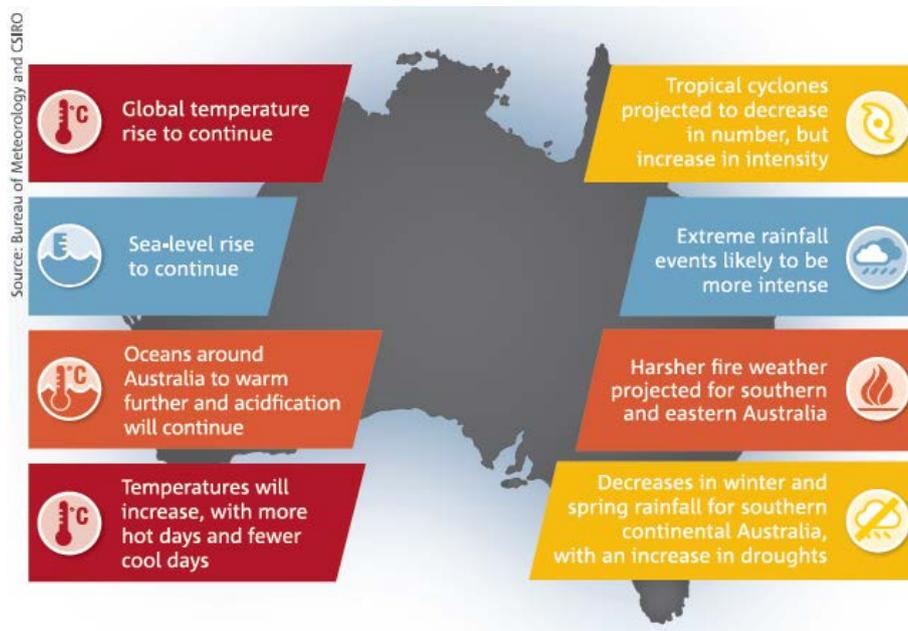
## Impact of climate change

2.1 This chapter examines the impact of climate change on fire frequency and magnitude in Tasmania and in particular, the Tasmanian Wilderness World Heritage Area (TWWHA). The committee heard that fire conditions and dry lightning strike are increasing in the TWWHA. Recent research into climate change and its impact on Tasmania has increased understanding of these threats to the World Heritage Area. However, stakeholders indicated that there is a continuing need for further recognition of, and preparation for, climate change in the TWWHA.

### Fire conditions and dry lightning strike

2.2 *State of the Climate* is a biennial review of variability and changes in Australia's climate, and how Australia's climate is likely to change in the future.<sup>1</sup> In October, the Bureau of Meteorology and the Commonwealth Scientific and Industrial Research Organisation (CSIRO) released *State of the Climate 2016*. Its findings are shown below.

**Figure 2.1: Predicted changes to Australia's climate, next 100 years**



Source: Bureau of Meteorology and Commonwealth Scientific and Industrial Research Organisation, *State of the Climate 2016*, 2016, p. 22, accessed 14 November 2016.

1 Bureau of Meteorology and Commonwealth Scientific and Industrial Research Organisation (CSIRO), *State of the Climate 2016*, 2016, <http://www.bom.gov.au/state-of-the-climate/State-of-the-Climite-2016.pdf> (accessed 14 November 2016).

2.3 Several submissions reflected these climate predictions. CSIRO, for example, reiterated that Australia is expected to experience a warming climate, with increases in extremely high temperatures, decreases in annual mean rainfall and relative humidity, and small changes in annual mean wind-speed. In particular:

Increases in the extent and frequency of droughts are likely in south-eastern Australia, and annual total forest fire danger index has increased 10–40 per cent in many locations in the last 35 years.<sup>2</sup>

2.4 The Department of the Environment and Energy (DEE) said that 'there has been an observed increase in extreme fire weather, and a longer fire season, in parts of Australia since the 1970s'. Further, 'future projections of these conditions show an increase in the frequency and severity of extreme fire danger'.<sup>3</sup>

2.5 Submitters agreed that fire conditions were elevated during the 2015–2016 fire season but the Bushfire and Natural Hazards Co-operative Research Centre (BNH CRC) commented that it was difficult to link the precedent conditions or bushfires to climate change although 'many researchers have pointed to this as a possibility'.<sup>4</sup>

2.6 Similarly, CSIRO cautioned that it is not clear how climate change will affect future fire risk, the behaviour and spread of bushfires, and the difficulty of suppressing bushfires, all of which depend on a number of factors.

The relationship between climate change, the occurrence of synoptic patterns conducive to elevated fire danger and the occurrence of bushfires in south-eastern Australia is complex, multi-faceted and only beginning to be understood.<sup>5</sup>

### *Reduced rainfall*

2.7 Several submissions noted weather elements—such as unseasonal warm temperatures, below average rainfall, low humidity and unprecedented soil dryness—that preceded and/or were present at the start of the 2016 bushfires.<sup>6</sup>

2.8 A particular focus was the amount of rainfall in south-eastern Australia leading up to the 2015–2016 fire season. The Wilderness Society (Tasmania) and Greenpeace Australia Pacific (Wilderness Society (Tasmania) and Greenpeace)

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2 CSIRO, *Submission 1*, p. 6. The Forest Fire Danger Index measures the degree of fire danger in Australian forests.

3 Department of the Environment and Energy (DEE), *Submission 23*, p. 3. Also see: United Firefighters Union of Australia–Tasmania Branch (United Firefighters Union (Tasmania)), *Submission 34*, p. 6.

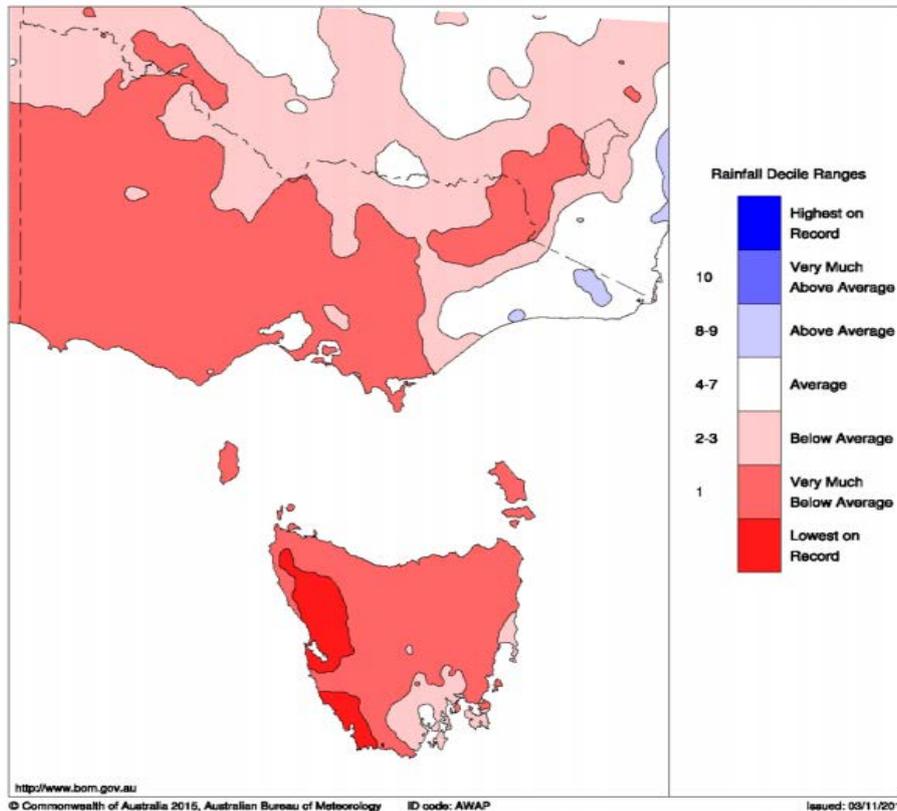
4 Bushfire and Natural Hazards Co-operative Research Centre (BNH CRC), *Submission 4*, p. 1. Also see: Friends of the Earth Australia, *Submission 19*, p. 2.

5 CSIRO, *Submission 1*, p. 6.

6 See for example: Tasmanian Government, *Submission 24*, p. 4; The Wilderness Society (Tasmania) and Greenpeace Australia Pacific (Wilderness Society (Tasmania) and Greenpeace), *Submission 27*, p. 7.

submitted that large parts of western Tasmania experienced the lowest spring rainfall on record, with the trend continuing into summer.<sup>7</sup>

**Figure 2.2: Rainfall in south-eastern Australia, 1 August to 31 October 2015**



Source: *Wilderness Society (Tasmania) and Greenpeace, Submission 27, p. 8.*

2.9 The BNH CRC reissued its seasonal bushfire outlook as a result of this exceptionally dry October.<sup>8</sup> The revised outlook assessed a significantly larger part of Tasmania as being at 'above normal' risk (not including the TWWHA which remained at 'normal') and observed:

The first half of spring has seen very low rainfall for almost all of Tasmania, especially in the west. Above-average daytime temperatures have increased evaporation rates, which further increases fuel dryness. The fire season has commenced in the eastern half of the state, with many fires proving difficult to control because of the dryness of fuels.<sup>9</sup>

2.10 The Australian Conservation Foundation similarly explained that the lack of rain had rendered wilderness areas—such as the TWWHA—unusually dry and susceptible to fire:

7 Wilderness Society (Tasmania) and Greenpeace, *Submission 27*, p. 7.

8 BNH CRC, *Submission 4*, p. 1.

9 BNH CRC, [Hazard Note](http://bnhcrc.com.au/hazardnotes/12), November 2015, Issue 12, <http://bnhcrc.com.au/hazardnotes/12> (accessed 14 November 2016).

Normally wet rainforests have a natural protection against fire, as they are cooler and wetter ecosystems than surrounding environments. The preceding dry spring and summer meant that this natural protection was compromised, and once the lightning sparked a flame, the amount of dry fuel above ground and dry peat below meant that the fires spread incredibly rapidly and were difficult to control.<sup>10</sup>

### ***Dry lightning strike***

2.11 In 2013, the Parks and Wildlife Service, Tasmania (PWS) reported that fires started by dry lightning strike now appear to be the main threat to the TWWHA. However, the PWS stated 'it is too early to know whether a shift in climate may be contributing to a long-term increasing trend in dry lightning activity in summers'.<sup>11</sup>

2.12 Some submitters and witnesses did not agree with this assessment, contending that climate change is creating, or likely creating, dry lightning storms. In particular, David Bowman, a Professor of Environmental Change Biology at the University of Tasmania, has argued that climate change is not only increasing fire frequency and magnitude, it is also causing the dry lightning storms that ignite bushfires.<sup>12</sup>

2.13 At the height of the 2016 bushfires, Professor Bowman wrote:

Since the declaration of the World Heritage Area, fire has been carefully regulated with a prohibition of campfires, which has sharply reduced the number of bushfires. Unfortunately, over the last decade there have been an increasing number of lightning storms that have ignited fires.

...

The current fire season is shaping up to be truly extraordinary because of the sheer number of fires set by lightning, their duration, and erratic and destructive behaviour that has surprised many seasoned fire fighters. The root cause of [this] has been the record-breaking dry spring and the largely rain-free and consistently warm summer, which has left fuels and peat soils bone dry.

There are two ways to think about the recent fire situation in Tasmania. We can focus on the extreme climate conditions and unusual fire behaviour, or we can see what is happening as entirely predictable and consistent with climate change.

I have formed the latter view because the current fires are part of a global pattern of increasing destructive fires driven by extreme fire weather.

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10 Australian Conservation Foundation, *Submission 20*, p. 4.

11 Parks and Wildlife Service, Tasmania (PWS), '[Case study—Fire Management in the Tasmanian Wilderness World Heritage Area](http://parks.tas.gov.au/file.aspx?id=35224)', 26 September 2013, p. 10, <http://parks.tas.gov.au/file.aspx?id=35224> (accessed 14 November 2016).

12 Professor David Bowman, *Submission 13*, p. 1.

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A critical feature of the current Tasmanian fires is the role of lightning storms—climate is not only creating the precursor weather conditions for the fires, it is also providing the storms that ignite them.<sup>13</sup>

2.14 Professor Bowman described this as a 'philosophical rupture with the very notion of wilderness'. He commented:

If you think about it, a wilderness is a free standing, self-sustaining system, independent of humans...what is occurring here is the challenge of managing systems where we have had certain expectations or certain understandings and those expectations are changing.<sup>14</sup>

2.15 Environmentalists and conservationists agreed with Professor Bowman's views on climate-induced fire conditions and dry lightning strike in the TWWHA. For example, the Australian Conservation Foundation submitted:

...climate change is increasing the regularity and intensity of the lightning that ignited the fires, drying out environments and fuel loads, and lengthening and intensifying the fire season.<sup>15</sup>

2.16 BirdLife Australia submitted that there is 'no empirical scientific evidence yet available to link the increased frequency of dry lightning strikes and concomitant fires in the TW WHA with contemporary changes in our climate'. However, 'the relationship is consistent with our current understanding and earlier predictions of increased frequency and intensity of extreme events associated with climate change'.<sup>16</sup>

2.17 The committee notes that CSIRO is currently researching the cause of bushfires in south-eastern Australia. Dr Andrew Sullivan from the CSIRO advised that the study does not include Tasmania but could do so if there were a reprioritisation of resources and access to historical fire occurrence data.<sup>17</sup>

### **Climate research**

2.18 The Australian and Tasmanian Governments acknowledge the need for further research on climate change in Tasmania. Both governments have funded a number of recent initiatives that have contributed to understanding of climate change. These studies are in addition to independent research projects.

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13 D. Bowman, 'Fires in Tasmania's ancient forests are a warning for all of us', *The Conversation*, 29 January 2016, <https://theconversation.com/fires-in-tasmanias-ancient-forests-are-a-warning-for-all-of-us-53806> (accessed 14 November 2016).

14 Professor David Bowman, *Committee Hansard*, Launceston, 2 November 2016, p. 11.

15 Australian Conservation Foundation, *Submission 20*, p. 3.

16 BirdLife Australia, *Submission 3*, p. 8. Also see: Rob Blakers, *Submission 21*, p. 2.

17 Dr Andrew Sullivan, Principal Research Scientist and Team Leader, Bushfire Behaviour and Risks, CSIRO, *Committee Hansard*, Canberra, 1 November 2016, p. 3. The project is in its early stages, with data analysis yet to commence.

### *Australian Government*

2.19 The Australian Government has a major role in the provision of authoritative climate information. The DEE identified a number of organisations that have recently received funding from the Australian Government and the purpose for that funding:

- CSIRO—to develop a set of national climate change projections (presented in regional clusters), to help plan for increased future fire weather and longer fire seasons;
- \$9 million over three years (2014–2017) to the National Climate Change Adaptation Research Facility, based at Griffith University—to develop practical information and tools to help manage climate risks; and
- a maximum of \$47 million over eight years (2013–2021) to the BNH CRC—to continue and expand research efforts into natural hazards.<sup>18</sup>

### *Tasmanian Government*

2.20 The Tasmanian Government also identified some of its initiatives to increase understanding of global warming risks to Tasmania, such as the *Climate Futures for Tasmania* project and, in particular, the Tasmanian Wilderness World Heritage Bushfire and Climate Change Research Project (Bushfire and Climate Change Research Project).<sup>19</sup>

2.21 In March 2016, the Tasmanian Premier, the Hon Will Hodgman, announced that the government would be investing \$250 000 in a 'forward looking research project that examines the impact of climate change and strengthens our fire-fighting techniques specific to our wilderness areas'.<sup>20</sup>

2.22 Dr Tony Press, Adjunct Professor of the Antarctic Climate and Ecosystems Cooperative Research Centre, was appointed to lead the Bushfire and Climate Change Research Project, which is expected to be completed by the end of 2016.<sup>21</sup>

2.23 At the Launceston public hearing, Dr Press presented the committee with some preliminary findings, including:

...the projections are that the [areal] extent of the TWWHA subject to dry lightning will actually decrease...but, on the other hand, the most extreme dry-lightning potential environmental events do not decrease in extent. You might get an overall decrease in dry-lightning events, but you will still get the same numbers of intense dry-lightning events. You will still get the

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18 DEE, *Submission 23*, p. 2.

19 Tasmanian Government, *Submission 24*, pp. 16–17.

20 The Hon Will Hodgman, Premier, '[Research project to protect wilderness areas](http://premier-dev.dpac.tas.gov.au/releases/research_project_to_protect_wilderness_areas)', *Media Release*, 9 March 2016, [http://premier-dev.dpac.tas.gov.au/releases/research\\_project\\_to\\_protect\\_wilderness\\_areas](http://premier-dev.dpac.tas.gov.au/releases/research_project_to_protect_wilderness_areas) (accessed 14 November 2016).

21 Dr Tony Press, Chair, Tasmanian Wilderness World Heritage Bushfire and Climate Change Research Project (Bushfire and Climate Change Research Project), *Committee Hansard*, Launceston, 2 November 2016, p. 17.

types of extreme events that have emerged over the last couple of decades with this picture of increased lightning in the Tasmanian Wilderness World Heritage Area. If you combine that with [the] general tendency for increased dryness and extended fire seasons, you can see that a pattern is emerging of fire risk, as a whole, increasing in the world heritage area over the century. Also, the vegetation communities into which to fire can spread will start to change, and you will start to get some of those vegetation communities that have historically been barriers to fire now becoming endangered themselves.<sup>22</sup>

2.24 Dr Press concluded that the risk of fire directly impacting natural (and to a lesser extent, cultural) values in the TWWHA will increase. He added 'the challenge is: how do you manage that landscape in order to protect those natural and cultural World Heritage values'?'<sup>23</sup>

2.25 The committee notes that the final report will examine 'the kinds of research that is required to underpin the management of the World Heritage Area'.<sup>24</sup>

### *Independent research projects*

2.26 Submitters and witnesses commented on various types of research that they considered will, or would, help to protect and conserve the TWWHA. This research focuses on dry lightning strike and ecological impacts where it was argued there is a lack of knowledge and understanding.

2.27 Dr Jonathan Marsden-Smedley, a fire researcher and operational fire management specialist based at the University of Tasmania, described his current project titled *Changes in the climate patterns of western and southwestern Tasmania: bushfires, snowpack and the implications of climate change*.

2.28 Dr Marsden-Smedley hypothesises that changes in Antarctic zone and other greenhouse gasses have increased the number of high pressure cells, and decreased the number of low pressure cells, crossing Tasmania, with consequent marked changes to Tasmania's weather (especially, to rainfall patterns in south-western and western Tasmania). In summer, these changes:

...increase the potential for lightning fires, and if fires start, the predominantly dry conditions result in a significant increase in the potential for large fires (eg greater than 10 000 ha) in all vegetation and soil types (eg fires in rainforests, alpine areas and peat).<sup>25</sup>

2.29 Dr Marsden-Smedley noted that, in the TWWHA, there has been 'about a 20 times increase in lightning fire number, about a 70 times increase in average

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22 Dr Tony Press, Chair, Bushfire and Climate Change Research Project, *Committee Hansard*, Launceston, 2 November 2016, p. 17. Also see p. 18.

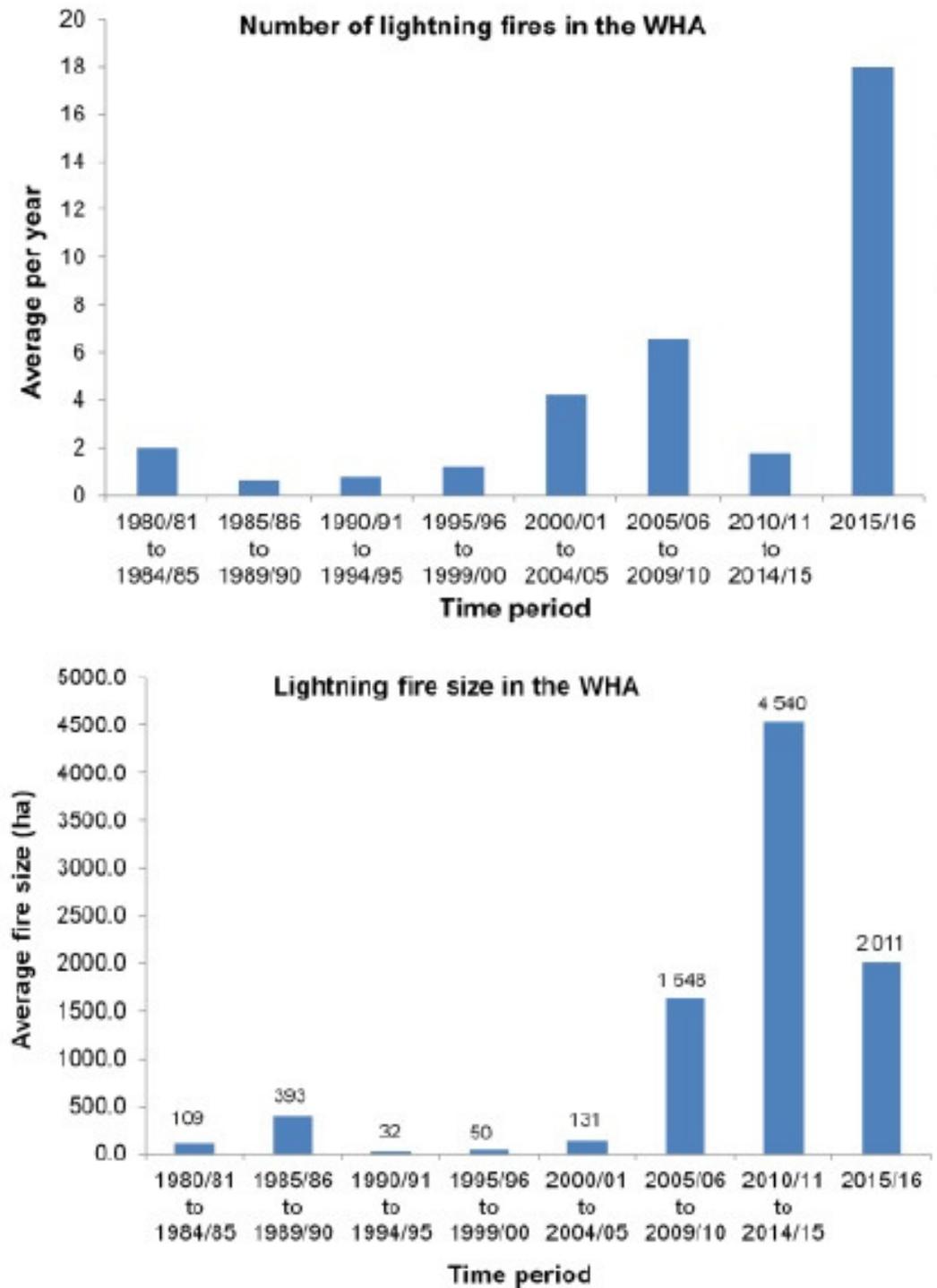
23 Dr Tony Press, Chair, Bushfire and Climate Change Research Project, *Committee Hansard*, Launceston, 2 November 2016, p. 18.

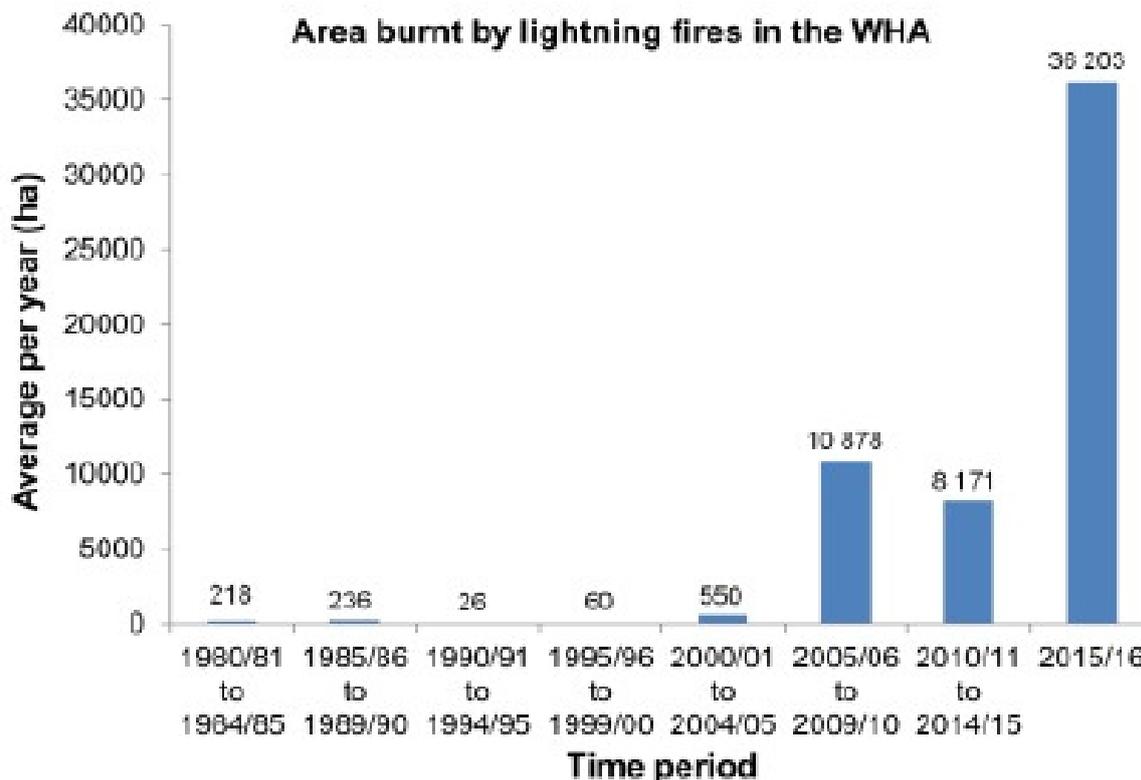
24 Dr Tony Press, Chair, Bushfire and Climate Change Research Project, *Committee Hansard*, Launceston, 2 November 2016, p. 17.

25 Dr Jonathan Marsden-Smedley, *Submission 17*, p. 2.

lightning fire size and about a 570 times increase in the area burnt by lightning fires', comparing the periods 1980–2000 and 2000–2016.<sup>26</sup>

**Figure 2.3: Lightning fires in the TWWHA, by number, size and burnt area, 1980–2016**





Source: Dr Jonathan Marsden-Smedley, *Submission 17*, p. 3.

2.30 The Australian Conservation Foundation submitted that it could not find any direct and publicly available research on climate impacts on lightning in Australia.<sup>27</sup> Its submission identified research from the United States of America, including a 2014 study that showed a 12 per cent increase in lightning for each degree of global warming.<sup>28</sup>

2.31 Professor Bowman highlighted other potential research areas: ecology research (see chapter three) and the threat to organic soils in the TWWHA caused by increased landscape fire in a warmer and drier climate:

Research is required to (a) evaluate the relationship between organic soil moisture and likelihood of combustion, (b) determine how this is affected by antecedent meteorological conditions and (c) quantify how fire intensity influences the vulnerability of organic soil loss due to combustion during fire and erosion afterwards.<sup>29</sup>

2.32 Professor Bowman told the committee that research should be peer reviewed and accessible in order to contribute to the body of knowledge. He considered that this has been 'a little bit underdone' in Tasmania, despite the TWWHA having 'extraordinarily interesting systems':

<sup>27</sup> Australian Conservation Foundation, *Submission 20*, p. 3.

<sup>28</sup> D.M. Romps et al (2014), 'Projected increase in lightning strikes in the United States due to global warming', *Science*, 14 November 2014: Vol. 346, Issue 62111, pp. 851–854, <http://science.sciencemag.org/content/346/6211/851.full> (accessed 14 November 2016).

<sup>29</sup> Professor David Bowman, *Submission 13*, p. 4.

It is a World Heritage area with many unique properties, and one of them is that it has got all this strange Gondwanic vegetation yet a lot of it is highly flammable. So getting that information out is extremely important...there is some really excellent science and excellent land management being done in the Tasmanian government. But it would probably be great if it could be seen.

...

That is how we are going to all inform ourselves, because the other thing with a rapidly developing situation like climate change is that we are all going to have to bend...Having these evidence based conversations is critical, and the evidence ideally is peer reviewed so people can understand it, it can be refined, it is available and it is credible.<sup>30</sup>

2.33 Dr Press acknowledged Professor Bowman's comments and advised that the Bushfire and Climate Change Research Project will 'pull a lot of that grey literature together and put in in one place so that [it can be incorporated] into the report'.<sup>31</sup>

### **Planning for climate change**

2.34 Some submitters and witnesses argued that increased fire conditions, changing ignition patterns and climate change increasingly threaten the Tasmanian wilderness.<sup>32</sup> Accordingly, policy makers should plan for a greater incidence and severity of bushfires in the TWWHA.

2.35 For example, the Tasmanian Greens argued:

Tasmanian and Australian governments have a legal and moral responsibility to ensure management of the TWWHA is appropriately resourced—and this will require increased resourcing—in the decades ahead as the threat to the Outstanding Universal Values of the TWWHA intensifies.<sup>33</sup>

2.36 Friends of the Earth Australia submitted:

The presence of climate change enhanced fire regimes needs to be considered the new reality of managing the WHA, with obvious implications for resourcing of firefighting agencies and approaches to managing fires when they do occur. Part of the response needs to involve a stronger focus on protecting those ecological assets which are most

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30 Professor David Bowman, *Committee Hansard*, Launceston, 2 November 2016, pp. 10–11.

On the subject of managing expectations, see: Professor David Bowman, *Committee Hansard*, Launceston, 2 November 2016, pp. 12–13; Dr Richard Thornton, Chief Executive Officer, BNH CRC, *Committee Hansard*, Launceston, 2 November 2016, p. 21.

31 Dr Tony Press, Chair, Bushfire and Climate Change Research Project, *Committee Hansard*, Launceston, 2 November 2016, p. 16.

32 See for example: BirdLife Australia, *Submission 3*, p. 2; Professor David Bowman, *Submission 13*, pp. 1–2; Mr Greg Cooper, Branch Secretary, United Firefighters Union (Tasmania), *Committee Hansard*, Launceston, 2 November 2016, p. 28.

33 Tasmanian Greens, *Submission 22*, p. 6.

vulnerable to the effects of fire. Fire sensitive vegetation in Tasmania is mapped, and information about priority ecosystems must form a core part of decision making when fire responders are allocating resources, both at the state wide and local levels.<sup>34</sup>

2.37 The Wilderness Society (Tasmania) and Greenpeace warned that 'widespread, simultaneous outbreaks of uncontrolled fires in remote, difficult country are...likely to become a frequent feature of Tasmanian summers'. The submission called on governments to respond to the 'permanent threat' by providing:

...increased financial resources for research, policy-making and coordination capacity pertaining to bushfires; for more permanent staff in key fire-fighting agencies and management authorities; and for increased capacity for remote-area and rapid response fire-fighting. However, on many of these long-term issues, governments are going backwards.<sup>35</sup>

2.38 A few submitters focused specifically on human resource requirements, arguing that this resource will affect Tasmania's capacity to respond to future bushfires. Mr Greg Cooper representing the United Firefighters Union of Australia–Tasmania Branch stated:

Climate change is real. I don't care what anyone says. It is real. It is getting warmer...It will impact. And in order to be able to manage it, you need to have more resources.<sup>36</sup>

2.39 The committee notes comments from the Landscapes and Policy Hub, a research body funded by the National Environmental Research Program. In a 2015 study for the Tasmanian State Emergency Service, the Landscapes and Policy Hub considered that increased fire danger will have social and political implications—such as influencing the pace and direction of fire policy, logistics and funding.<sup>37</sup>

2.40 Following the 2016 bushfires, the Tasmanian fire agencies commissioned an independent review into the management of the fires (2016 Independent Operational

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34 Friends of the Earth Australia, *Submission 19*, p. 3.

35 Wilderness Society (Tasmania) and Greenpeace, *Submission 27*, p. 23. The submission referred to the 2014–2015 Federal Budget, wherein CSIRO's research funding was reduced by \$111.4 million over five years: Commonwealth of Australia, *Budget Measures: Budget Paper No. 2 2014–15*, p. 170, [http://www.budget.gov.au/2014-15/content/bp2/download/BP2\\_consolidated.pdf](http://www.budget.gov.au/2014-15/content/bp2/download/BP2_consolidated.pdf) (accessed 14 November 2016). Also see: Australian Conservation Foundation, *Submission 20*, p. 5.

36 Mr Greg Cooper, Branch Secretary, United Firefighters Union (Tasmania), *Committee Hansard*, Launceston, 2 November 2016, p. 31. In 2013, the National Institute of Economic and Industry Research estimated that Tasmania will need to employ an additional 72 career firefighters by 2030: National Institute of Economic and Industry Research, *Firefighters and Climate Change*, February 2013, p. 26 (accessed 14 November 2016). Also see: Friends of the Earth Australia, *Submission 1*, p. 3.

37 Landscapes and Policy Hub, *Fire danger in Tasmania: the next 100 years*, March 2015, p. 3, <http://www.nerlandscapes.edu.au/system/files/LaP3%20Future%20fire%20danger%20summary%20-%20singles.pdf> (accessed 14 November 2016).

Review).<sup>38</sup> The review was conducted by the Australasian Fire and Emergency Service Authorities Council (AFAC) and was released in April 2016.<sup>39</sup>

2.41 The Review Team commented briefly on climate change and its predicted impact on future fire conditions:

...there is considerable scientific advice and evidence to the effect that climate change may bring about longer and more severe fire seasons, reducing opportunities for controlled burning and increasing pressure on firefighting resources. While many people we spoke to considered fire conditions in Tasmania in early 2016 to be unprecedented in terms of drought conditions and availability of fuels to burn, we consider that it would be prudent for the Tasmanian fire agencies to plan on the basis that these conditions may recur in the future.<sup>40</sup>

2.42 Various other aspects of the 2016 Independent Operational Review are considered later in chapters three and four of this report.

### **Committee view**

2.43 Reputable organisations have accurately predicted global warming that has resulted in Australian climate change. Submitters agreed that this has manifested in increased fire conditions in the TWWHA, although the precise link between climate change and bushfires has not yet been determined. The committee notes that over time the threat will also increase due to the erosion of natural protections that are currently available to certain vegetation types.

2.44 In order to mitigate and prepare for risks posed by global warming, the committee considers that the Australian Government should recognise that climate change has increased fire conditions in south-eastern Australia and the risk to natural and cultural values in the Tasmanian Wilderness World Heritage Area.

### **Recommendation 1**

**2.45 The committee recommends that the Australian Government:**

- **recognise that climate change has increased fire conditions in south-eastern Australia and the risk to natural and cultural values in the Tasmanian Wilderness World Heritage Area; and**

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38 The Tasmanian fire agencies are: PWS, Tasmania Fire Service, and Forestry Tasmania.

39 Australasian Fire and Emergency Service Authorities Council (AFAC), *AFAC Independent Operational Review, A review of the management of the Tasmanian fires of January 2016* (2016 Independent Operational Review), Prepared for Tasmania Fire Service, Forestry Tasmania and Parks and Wildlife Service Tasmania, April 2016, <http://www.nerplandscapes.edu.au/system/files/LaP3%20Future%20fire%20danger%20summary%20-%20singles.pdf> (accessed 14 November 2016).

40 AFAC, 2016 Independent Operational Review, Prepared for Tasmania Fire Service, Forestry Tasmania and Parks and Wildlife Service Tasmania, April 2016, p. 8 (accessed 14 November 2016).

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- **report annually to the World Heritage Committee on the state of conservation in the Tasmanian Wilderness World Heritage Area.**

2.46 There is some disagreement on whether climate change will cause a long-term increase in the number of dry lightning strikes in the TWWHA. However, on the evidence available, it is clear that these strikes pose a significant and increasing threat to the World Heritage Area.

2.47 Governments and stakeholders recognise that there is a paucity of research specific to climate change in Tasmania. The committee is pleased to see recent efforts being made to bridge this knowledge gap, including independent research in relation to dry lightning strike in the TWWHA. The committee notes however that there does not appear to be a research focus on climate-related ecological and biodiversity impacts, which are integral facets of the World Heritage listing.

2.48 The committee is concerned that increasing climate change will continue to threaten the TWWHA and its OUV. To plan for and manage these impacts, authoritative and publicly available information is essential.



# Chapter 3

## Assessment and modelling capacity

3.1 This chapter examines the adequacy of fire assessment and modelling capacity for the Tasmanian Wilderness World Heritage Area (TWWHA).<sup>1</sup> The committee heard that the current fire models do not consider the unique vegetation types found in the World Heritage area and there are no plans to rectify the situation. This chapter discusses the use of Australian fire models and Tasmania's layered map of fire sensitive vegetation communities (TASVEG), before examining current efforts to provide a Tasmania-specific fire model.

### Australian fire models

3.2 In Australia, fire assessment and modelling has traditionally focused on specific fire models for each general class of vegetation in which bushfires occur.<sup>2</sup> This approach contrasts with other countries—such as the United States of America—where a general fire spread model (the Rothermel model) is used, with fuel specific models employed to make more precise predictions.<sup>3</sup>

3.3 According to the Commonwealth Scientific and Industrial Research Organisation (CSIRO), the Australian approach has the advantage of enabling development and refinement of a model for a specific fuel type, without affecting predictions for other fuel types (a fault of the Rothermel model). The downside to this approach is that the known effect of a particular fuel type on fire behaviour is required before a fire behaviour model can be developed for that fuel type.<sup>4</sup>

### TWWHA fire model

3.4 CSIRO advised that Tasmania has fuel types for which there is no fire model or no suitable model for wildfire conditions:

These include peat, rainforest, wet heath, alpine forest, alpine scrub and wet eucalypt forest, which represent many of the predominant fuel types found in sensitive and Tasmanian Wilderness Heritage Areas. The only fire behaviour model that has been developed specifically for a Tasmanian fuel type is the Buttongrass model of Marsden-Smedley and Catchpole (1995).

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1 Fire assessment and modelling attempts to predict 'fire behaviour', a descriptive term for various aspects of a bushfire—such as its rate of spread, the fireline intensity, flame height, angle and length, and spotting distance: Commonwealth Scientific and Industrial Research Organisation (CSIRO), *Submission 1*, p. 10.

2 There are four major vegetation types (grassland, native forest, shrubland and plantation) combined with 13 fuel types (for example, buttongrass, temperate shrubland and radiata pine).

3 CSIRO, *Submission 1*, p. 10.

4 CSIRO, *Submission 1*, p. 10.

The applicability of existing wildfire behaviour models to other Tasmanian fuel types is unknown.<sup>5</sup>

3.5 Dr Andrew Sullivan from CSIRO indicated that, as a result, Tasmanian fire agencies cannot make accurate predictions of fire spread in the TWWHA.<sup>6</sup> Professor David Bowman, an environmental change biologist, agreed that the inaccuracy of the fire models is challenging for fire managers.<sup>7</sup>

3.6 In relation to the 2016 bushfires, the Tasmanian Greens said:

The modelling available to the State Government predicted the fires would not progress through these vegetation types [alpine vegetation and rainforest], as the inputs to this modelling defined these landscapes as too moist to burn. Put simply, the fires burnt where they were not meant to burn.<sup>8</sup>

3.7 Some witnesses, including Dr Tony Press from the Tasmanian Wilderness World Heritage Bushfire and Climate Change Research Project and Mr Geoff Law from The Wilderness Society (Tasmania), contended that there is a critical need for a fire model based on the vegetation types and organic soils found in the TWWHA in order to manage its ecosystem.<sup>9</sup>

3.8 Dr Sullivan agreed:

You need to be able to determine the conditions in which fires are likely to begin to spread—so the initiation. There is lots of dry lightning that occurs that does not start fires, so we need to be able to determine when it is likely that dry lightning is going to start a fire. When that fire does start, we need to know how fast it is going to move and where it is going to spread to. We also need to know under what conditions it is likely to go out.<sup>10</sup>

3.9 Professor Bowman indicated that the precursor to developing a specific fire model for the TWWHA is targeted landscape ecology research. Such research would

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5 CSIRO, *Submission 1*, p. 12.

6 Dr Andrew Sullivan, Principal Research Scientist and Team Leader, Bushfire Behaviour and Risks, CSIRO, *Committee Hansard*, Canberra, 1 November 2016, p. 2.

7 Professor David Bowman, *Committee Hansard*, Launceston, 2 November 2016, p. 13.

8 Tasmanian Greens, *Submission 22*, p. 7.

9 Dr Tony Press, Chair, Tasmanian Wilderness World Heritage Bushfire and Climate Change Research Project, *Committee Hansard*, Launceston, 2 November 2016, p. 18; Dr Richard Thornton, Chief Executive Officer, Bushfire and Natural Hazards Co-operative Research Centre (BNH CRC), *Committee Hansard*, Launceston, 2 November 2016, p. 22; Mr Geoff Law, Consultant, The Wilderness Society (Tasmania), *Committee Hansard*, Launceston, 2 November 2016, p. 46. Also see: Professor David Bowman, *Committee Hansard*, Launceston, 2 November 2016, p. 13, who advised that there is currently some research being undertaken in relation to fire hazard fuel loading in wet eucalypt forests.

10 Dr Andrew Sullivan, Principal Research Scientist and Team Leader, Bushfire Behaviour and Risks, CSIRO, *Committee Hansard*, Canberra, 1 November 2016, p. 4. Dr Sullivan noted that it would take some time to build a specific fire model for the TWWHA: p. 2.

enable detailed assessment of how fire sensitive vegetation has been affected by recent fires:

Specifically, I recommend landscape ecology analyses...are required to understand the spread and impact of the recent fire in western Tasmania. This will help us better understand the effect of weather conditions, vegetation and terrain and land management history including wildfires and planned burns. Such analyses enable the development of evidence-based management.<sup>11</sup>

3.10 The committee notes that, in addition to ecology and fire management, there is an argument for the adequate modelling of fire behaviour for 'life safety' reasons.<sup>12</sup>

### ***Phoenix RapidFire***

3.11 Submitters commented on Phoenix RapidFire, a computer program used by the Tasmanian Government to predict the likely spread of a bushfire. One of the developers of the program, Kevin Tolhurst, a Forestry Professor at the Melbourne Sustainable Society Institute, has published how the program simulates likely fire spread:

Within seconds, the program crunches data on weather, wind, vegetation, the slope of the land and how dry the bush is. It turns this into a map of where the fire is likely to go, overlaid on Google Earth, and displays the results as a video. The program also diagnoses the type of fire—how hot will it burn? How high will the flames go? Where might embers land? Trained fire analysts monitor and act on the results.<sup>13</sup>

3.12 One of the program developers—the Bushfire and Natural Hazards Co-operative Research Centre (BNH CRC)—described Phoenix RapidFire as 'one of the best [simulators] available in Australia'.<sup>14</sup> Its submission acknowledged however that 'empirical fire spread models are only as good as the observations and fire behaviour models which have been used'.<sup>15</sup>

3.13 Further, Phoenix RapidFire has known limitations:

These limitations primarily occur at extreme fire danger levels, where there is substantial interaction between the fire and the atmosphere, which is why the Bushfire and Natural Hazards CRC has extensive research underway to produce better fire spread models. However, the simulations can also prove

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11 Professor David Bowman, *Submission 13*, p. 4.

12 Mr Greg Cooper, Branch Secretary, United Firefighters Union of Australia–Tasmania Branch, *Committee Hansard*, Launceston, 2 November 2016, p. 29. Also see: Mr Chris Arnol, Chief Officer, Tasmania Fire Service (TFS), *Committee Hansard*, Launceston, 2 November 2016, p. 58.

13 K. Tolhurst, 'Predicting the path of bushfires', Melbourne Sustainable Society Institute, <http://sustainable.unimelb.edu.au/tolhurst> (accessed 14 November 2016).

14 Phoenix RapidFire is currently used in several jurisdictions other than Tasmania (Victoria, New South Wales, Queensland, South Australia).

15 BNH CRC, *Submission 4*, p. 2. Also see: CSIRO, *Submission 1*, p. 11.

difficult at very low fire danger ratings levels in the types of fuels seen in these fires. The models may predict the fires should not spread and go out, but in peat they may continue to smoulder and reignite.<sup>16</sup>

3.14 The committee notes that Phoenix RapidFire is currently being 'updated' to improve its accuracy, particularly in the areas of landscape dryness measures, weather forecasting and the use of remote sensing products.<sup>17</sup>

## **TASVEG**

3.15 The Department of Primary Industries, Parks, Water and Environment (Tas) (DPIPWE) has mapped the fire sensitive vegetation communities of the TWWHA. According to DPIPWE, this mapping enables Tasmanian fire agencies to develop plans for priority protection in the event of fire.<sup>18</sup>

3.16 However, the Tasmanian National Parks Association expressed concern that the database and published map (TASVEG) contain errors. Its submission described a sample review of the underlying data that it found to contain a number of spatial and coding errors:

If this is the case in this small sample area then it is possible that many more such errors occur elsewhere. This has major implications for GIS-based assessments of fire impacts (e.g. areas of sensitive vegetation types burnt) and it is self-evident that it is impossible to effectively prioritise fire-fighting efforts if the locations of the values being protected are not accurately known. It is therefore essential that a state-wide review of the accuracy of mapping of all fire sensitive natural values is undertaken, and resources made available to improve the quality of such data if it is determined to be deficient.<sup>19</sup>

3.17 To illustrate the inadequacies of TASVEG, Mr Nicholas Sawyer from the Tasmanian National Parks Association provided a photograph, said to show a hillside marked by TASVEG as an extensive Pencil Pine forest.

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16 BNH CRC, *Submission 4*, p. 2.

17 BNH CRC, *Submission 4*, p. 2.

18 Department of Primary Industries, Parks, Water and Environment (DPIPWE), [TASVEG – The Digital Vegetation Map of Tasmania](http://dpiwwe.tas.gov.au/conservation/flora-of-tasmania/monitoring-and-mapping-tasmanias-vegetation-(tasveg)/tasveg-the-digital-vegetation-map-of-tasmania), [http://dpiwwe.tas.gov.au/conservation/flora-of-tasmania/monitoring-and-mapping-tasmanias-vegetation-\(tasveg\)/tasveg-the-digital-vegetation-map-of-tasmania](http://dpiwwe.tas.gov.au/conservation/flora-of-tasmania/monitoring-and-mapping-tasmanias-vegetation-(tasveg)/tasveg-the-digital-vegetation-map-of-tasmania) (accessed 14 November 2016).

19 Tasmanian National Parks Association, *Submission 16*, p. 3.

**Figure 3.1: Frozen Lagoon, south-west of Lake Mackenzie on the Central Plateau**



*Source: Additional Information provided by Tasmanian National Parks Association, received 11 November 2016*

3.18 Mr John Whittington, Secretary of DPIPWE, responded to this concern, saying that TASVEG is an amalgam of data from a range of sources and is not designed to pinpoint the location of vegetation: 'it is at a coarser scale than that'. Mr Whittington went on to comment:

People run into trouble with TASVEG when they use it for a purpose that it is not capable of supporting. I am confident that TASVEG is as good as any vegetation-mapping capacity around the nation, but it needs to be used appropriately.<sup>20</sup>

3.19 The committee notes the Tasmania Fire Service's response that finer scale vegetation mapping would be of assistance.<sup>21</sup>

### **Current efforts to develop a Tasmania-specific fire model**

3.20 Submitters and witnesses indicated that there is no research currently being undertaken to support the development of a Tasmania-specific fire model.

3.21 When the committee sought further evidence of specific fire modelling, from CSIRO, a representative stated that CSIRO was not aware of any proposal to conduct ecology landscape research, although the organisation has a long history of bushfire research, including the development of tools to predict the behaviour and spread of bushfires.<sup>22</sup>

3.22 Dr Sullivan told the committee that ecology landscape research has not been prioritised, with research focusing on 'life safety' in the past 10 years. This focus has

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20 Mr John Whittington, Secretary, DPIPWE, *Committee Hansard*, Launceston, 2 November 2016, p. 58. Also see: Dr Andrew Sullivan, Principal Research Scientist and Team Leader, Bushfire Behaviour and Risks, CSIRO, *Committee Hansard*, Canberra, 1 November 2016, p. 6.

21 Mr Chris Arnol, Chief Officer, Tasmania Fire Service, *Committee Hansard*, Launceston, 2 November 2016, p. 58.

22 Dr Andrew Sullivan, Principal Research Scientist and Team Leader, Bushfire Behaviour and Risks, CSIRO, *Committee Hansard*, Canberra, 1 November 2016, p. 2.

been accompanied by a policy shift away from management toward a response-driven approach.<sup>23</sup>

3.23 Dr Sullivan suggested also that the development of fire spread models may have decreased in recent years due to reliance upon existing models that are assumed to work 'well enough'. He described how experienced individuals often fill the gap but forewarned against the retirement of these individuals:

Because we do not have formal fire behaviour models does not mean that an individual who has experience cannot undertake their own predictions. So quite often the gap gets filled by well-experienced people who have been doing it for many years. The problem is that, when they retire and move on, that gap becomes evident and people assume, 'Oh, they were just using whatever model was available at the time,' and continue on without actually identifying that there is a gap in the knowledge, because the expert knowledge that had been contained in that individual filled that gap for them.<sup>24</sup>

3.24 CSIRO advised that a multi-agency approach would produce a practical fire model for Tasmania, and CSIRO was in a prime position to lead such research. However, this would require governments to prioritise ecology landscape research, including through additional funding:

There is only so much that can be done given the scale that we have, and in order to ramp up and solve the problem as comprehensively as it needs to be it may need a larger scale, which could be beyond CSIRO's capacity at this point.<sup>25</sup>

3.25 Other witnesses spoke about research funding difficulties. For example, Professor Bowman told the committee that there are various funding models such as collaboration with industry partners, competitive Australian Research Grants or funding through the BNH CRC.<sup>26</sup>

3.26 Dr Richard Thornton, Chief Executive Officer of the BNH CRC, indicated that funding is always difficult, with its budget largely allocated through forward years. This allows only for 'elements that we can do in the short term'.<sup>27</sup>

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23 Dr Andrew Sullivan, Principal Research Scientist and Team Leader, Bushfire Behaviour and Risks, CSIRO, *Committee Hansard*, Canberra, 1 November 2016, p. 2.

24 Dr Andrew Sullivan, Principal Research Scientist and Team Leader, Bushfire Behaviour and Risks, CSIRO, *Committee Hansard*, Canberra, 1 November 2016, p. 6. Also see: Mr Gavin Freeman, Deputy Chief Officer, TFS, *Committee Hansard*, Launceston, 2 November 2016, p. 58.

25 Dr Andrew Sullivan, Principal Research Scientist and Team Leader, Bushfire Behaviour and Risks, CSIRO, *Committee Hansard*, Canberra, 1 November 2016, p. 5. At present, the CSIRO's Bushfire Behaviour and Risks team is working on four projects: CSIRO, answer to question on notice, received 7 November 2016.

26 Professor David Bowman, *Committee Hansard*, Launceston, 2 November 2016, pp. 13–14.

27 Dr Richard Thornton, Chief Executive Officer, BNH CRC, *Committee Hansard*, Launceston, 2 November 2016, p. 22.

3.27 In addition, Dr Thornton explained that, for the BNH CRC, the 'focus has always been on the national issues that get to the heart of some of the systemic problems that we see, not so much on the local issues'. He indicated that, for Tasmania-specific issues, the Tasmanian Government could fund a research portfolio but it would still be 'a balance' of priorities.<sup>28</sup>

3.28 Finally, Professor Bowman argued that the Commonwealth Department of the Environment and Energy (DEE) and DPIPWE are not well integrated with the university sector, resulting in ad hoc management and research for the TWWHA:

...there is no real go-to place for research in the World Heritage area. It is just a whole lot of very committed people who are doing things and shift shaping as the opportunities arise. There is not really a central organising principle and there is not a reliable income stream for sustaining the research—certainly in the university sector.<sup>29</sup>

### *Government responses*

3.29 In February, the DEE informed the Senate Environment and Communications Legislation Committee that the department has not undertaken any modelling to prepare for and manage increased fire risk in the TWWHA. An officer advised that this is the responsibility of the Tasmanian Government.<sup>30</sup>

3.30 For this inquiry, Mr Chris Arnol, Chief Officer of the Tasmania Fire Service, explained that a specific fire model was never developed for the TWWHA, as the need was not anticipated. However, Mr Arnol recognised:

...it would be better to have modelling for Tasmanian environments ...What has been modelled in New South Wales does not necessarily apply in Tasmania...so we have to ground-truth them or check them...When we look at the range of models, there is, in my view, a fair bit of work that we could do there.<sup>31</sup>

3.31 A representative from the Attorney-General's Department (AGD), Mr Mark Crossweller, warned however that modelling is a recent phenomenon that does not necessarily supplant or surpass the assessment of a professional firefighter:

...firefighters are trained to read the fireground to anticipate fire conditions, rates of spread, intensities and all that comes with it, separate from technology. Technology can assist. It is becoming more useful. Some

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28 Dr Richard Thornton, Chief Executive Officer, BNH CRC, *Committee Hansard*, Launceston, 2 November 2016, p. 22.

29 Professor David Bowman, *Committee Hansard*, Launceston, 2 November 2016, p. 14.

30 Mr Stephen Oxley, First Assistant Secretary, Wildlife, Heritage and Marine, Department of the Environment and Energy (DEE), *Estimates Hansard*, 8 February 2016, p. 158. The DEE then noted that it has been working with the South Australian and Victorian Governments to conduct a strategic assessment of their fire practices: Mr Dean Knudson, Deputy Secretary, Environment Protection Group, DEE.

31 Mr Chris Arnol, Chief Officer, TFS, *Committee Hansard*, Launceston, 2 November 2016, p. 58.

modelling has been very inaccurate compared to manifest circumstances, so to rely only on modelling could be more dangerous than having no modelling at all. Modelling is getting better, but I do not think that one can assume that modelling supplants or surpasses the capacity for understanding fire behaviour, as a practitioner.<sup>32</sup>

3.32 Mr Crowweller noted that Australian, state and territory governments are currently collaborating on the National Fire Danger Rating System–Probabilistic Framework Project. This project is being managed by the NSW Rural Fire Service and aims to develop:

...a new consequence-based fire danger rating system able to integrate a wide range of variables and link their complex interactions to the probability of *property loss*. The project aims at delivering a spatially-explicit framework capable of generating daily maps representing the distribution of the probability of property loss at 10Km spatial resolution.<sup>33</sup>

3.33 Mr Crowweller stated the project demonstrates that 'much research and investment is going into fire modelling in predictive analysis and behaviour to apply to multiple vegetation types across the landscape of Australia'.<sup>34</sup>

3.34 The committee notes that the first phase of the project will deliver a prototype National Fire Danger Rating System based on the 'best currently available science'. This means that the prototype will not encompass TWWHA vegetation types for which there are no fire behaviour models (peat rainforest, wet heath alpine forest, alpine scrub or wet eucalypt forest).<sup>35</sup>

### Committee view

3.35 Fire assessment and modelling is a highly important tool for Tasmanian fire agencies, enabling them to more accurately predict fire behaviour and manage fires within their jurisdiction. However, CSIRO—and several others—highlighted that there is no fire model suited to the specific needs of the TWWHA. The committee is of the view that, had such a model been available, the Tasmanian fire agencies would

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32 Mr Mark Crowweller, Director General, Emergency Management Australia, Attorney-General's Department (AGD), *Committee Hansard*, Canberra, 1 November 2016, p. 14. Also see p. 15.

33 G. Caccamo, T.D. Penman and R.A. Bradstock, *National Fire Danger Rating System Probabilistic Framework Project, Final Report for Year 1*, Report for the Attorney-General's Department and the Bushfire Cooperative Research Centre, October 2012, p. 4, [http://bushfirecrc.com/sites/default/files/managed/resource/probabilistic\\_framework\\_project\\_final\\_report\\_1112.pdf](http://bushfirecrc.com/sites/default/files/managed/resource/probabilistic_framework_project_final_report_1112.pdf) (accessed 14 November 2016) (emphasis added). The framework includes a range of variables—other than weather elements—such as fuel load and type, the nature of the terrain and housing density in a particular region.

34 Mr Mark Crowweller, Director General, Emergency Management Australia, AGD, *Committee Hansard*, Canberra, 1 November 2016, p. 15.

35 AGD, answer to question on notice, pp. 1–2, received 9 November 2016. The response notes that the development of new fire spread models for Tasmania is out of scope for the prototype phase.

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have been better prepared to respond to the 2016 bushfires. The committee considers that this deficiency should be addressed as soon as possible, commencing with the necessary groundwork in ecological landscape research.

3.36 In this context, the committee notes that the Tasmanian Government simulates fire behaviour using Phoenix RapidFire, a software program that requires, and will always require, current data. The committee has some concerns that reliance upon such a program could exacerbate the challenges currently facing Tasmanian fire agencies, especially as the program has known limitations in relation to organic (peat) soils.

3.37 While several submitters and witnesses highlighted the critical need for a Tasmania-specific fire model, the committee was surprised to learn that there are no current plans for research to support the development of such a model. One key reason for this appears to be a lack of funding. The committee considers that the Australian and Tasmanian Governments should prioritise ecology landscape research in the TWWHA, with long-term funding provided to enable the CSIRO to lead a multi-agency research project on this issue. The committee notes that the TWWHA is home to a number of endemic fauna species (see chapter one) and that predicting fire behaviour and spread is important also to the protection and conservation of fauna values.

## **Recommendation 2**

**3.38 The committee recommends that the Australian Government, in cooperation with the Tasmanian Government:**

- **recognise the need to identify the ecological and biodiversity impacts of fire on fire sensitive vegetation communities, organic soils and endemic fauna species in the Tasmanian Wilderness World Heritage Area; and**
- **allocate long-term funding to the Commonwealth Scientific and Industrial Research Organisation and/or the Tasmanian Government to assist with the development of fire assessment and modelling specifically suited to the Tasmanian Wilderness World Heritage Area.**



# Chapter 4

## Financial, human and mechanical resources

4.1 This chapter examines the financial, human and mechanical resources that were available and provided in response to the 2016 bushfires in the Tasmanian Wilderness World Heritage Area (TWWHA).

### Available firefighting resources

4.2 In Australia, state and territory governments are primarily responsible for protecting life, property and environment within their jurisdiction. This includes responding to bushfires.<sup>1</sup> Tasmania's emergency management arrangements comprise a mix of state and regional planning (for example, the Tasmanian Emergency Management Plan), as well as interagency arrangements.<sup>2</sup>

4.3 The states and territories also have inter-jurisdictional arrangements. In addition to bilateral agreements, *Arrangements for Interstate Assistance* (AIA) enables the timely and meaningful exchange of capabilities during significant incidents (fire services, emergency services and land management agencies). The AIA is the primary arrangement for mutual assistance in emergency management activities conducted by Australian and New Zealand agencies.<sup>3</sup>

4.4 The Australian Government provides assistance only when a state or territory decides that its resources will not be able to effectively manage an incident. A formal request for assistance can be made to Emergency Management Australia (EMA), a division within the Attorney-General's Department (AGD), to activate the Australian Government Disaster Response Plan (COMDISPLAN).<sup>4</sup>

### National Aerial Firefighting Centre

4.5 In 2003, the states and territories formed the National Aerial Firefighting Centre (NAFC) to provide a national arrangement for the provision of aerial

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1 Attorney-General's Department (AGD), *Submission 2*, p. 5.

Also see: Mr Mark Crossweller, Director General, Emergency Management Australia, AGD, *Committee Hansard*, Canberra, 1 November 2016, p. 10.

2 Australasian Fire and Emergency Service Authorities Council (AFAC), [\*AFAC Independent Operational Review, A review of the management of the Tasmanian fires of January 2016\*](#) (2016 Independent Operational Review), Prepared for Tasmania Fire Service, Forestry Tasmania and Parks and Wildlife Service Tasmania, April 2016, pp. 17–18, [https://www.fire.tas.gov.au/userfiles/tym/file/misc/1604\\_tasfirereport\\_final1.pdf](https://www.fire.tas.gov.au/userfiles/tym/file/misc/1604_tasfirereport_final1.pdf) (accessed 15 November 2016).

3 Tasmanian Government, *Submission 24*, p. 21. A request for assistance is made to the Commissioners and Chief Officers Strategic Committee, the national body responsible for coordinating operational matters during significant incidents.

4 AGD, *Submission 2*, p. 2. The Australian Government also provides financial assistance to help eligible individuals and communities recover from major disasters (such as Natural Disaster Relief and Recovery Arrangements): pp. 3–4.

firefighting resources. One of its roles is to coordinate the leasing of a national fleet of highly specialised firefighting aircraft, which are made available to fire agencies to supplement the fleets leased or owned by individual jurisdictions. The NAFC explained:

One of the main benefits of these national arrangements is the ability of states and territories to access increased capacity, or "surge" capacity, for aerial fire suppression at times of peak bushfire activity. It is not practical, sensible or cost-effective for each individual state and territory to maintain the necessary specialised resources for all situations.<sup>5</sup>

4.6 The NAFC is jointly funded by the Australian, state and territory governments. The fixed (standing) costs of the leased national fleet are largely met by the states and territories, with the Australian Government making an annual contribution of \$14.8 million toward this cost. The operational costs are met by the state and territories that utilise the contracted aircraft for bushfire suppression.<sup>6</sup>

4.7 The NAFC's submission noted:

Australian Government funding has been a significant factor in catalysing the success of the NAFC arrangements. The Australian Government funding is, however, forecast to diminish in real terms, whereas the cost of providing aerial resources will rise. This may lead to a reduction in access to aerial resources in the future.<sup>7</sup>

4.8 During the 2015–2016 bushfire season, the leased national fleet comprised 127 aircraft, most of which were based in Australia. Mr Richard Alder, General Manager of the NAFC, explained that the larger aircraft (20–25) tend to be contracted from the Northern Hemisphere (for example, the United States of America and Greece), where the fire seasons are largely complementary.<sup>8</sup>

4.9 In view of climate change predictions, and changing demographics and land use, the NAFC submitted that the demand for aerial firefighting resources is likely to increase. Therefore:

There is an imperative to continue the current, collaborative national arrangements to ensure efficient use of resources and to provide reliable access to surge capacity. There will also be a need to consider the provision of enhanced capabilities necessary to meet forecast increased demand.<sup>9</sup>

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5 National Aerial Firefighting Centre (NAFC), *Submission 18*, p. 3.

6 NAFC, *Submission 18*, p. 3; Mr Richard Alder, General Manager, NAFC, *Committee Hansard*, Launceston, 2 November 2016, p. 5.

7 NAFC, *Submission 18*, p. 5.

8 Mr Richard Alder, General Manager, NAFC, *Committee Hansard*, Launceston, 2 November 2016, pp. 1, 4–5 and 7; AGD, answer to question on notice, Attachment A, received 9 November 2016; NAFC, answer to question on notice, pp. 6–10, received 11 November 2016.

9 NAFC, *Submission 18*, p. 5.

## Resources provided in response to the 2016 bushfires

4.10 Submitters and witnesses acknowledged that the scale of the 2016 bushfires in Tasmania was unprecedented, and paid tribute to the efforts of all agencies and personnel involved in suppressing those fires.<sup>10</sup>

4.11 The Australian and Tasmanian Governments were especially complimentary. AGD submitted that the response had been 'significant and collaborative', emphasising that all jurisdictions had offered assistance under the AIA.<sup>11</sup> Similarly, the Tasmanian Government described these efforts as 'extraordinary' in terms of the dedicated financial, human and mechanical resources:

In total, more than 5,600 Tasmanian volunteer and career firefighters, over 1,000 interstate and international firefighters, and as many as 40 aircraft were deployed. It is of great credit to Tasmania's emergency management arrangements across prevention, preparedness, response and recovery, and the professionalism of our fire agencies, that the response was successful in protecting the community and minimising damage to infrastructure and the natural environment.<sup>12</sup>

4.12 The Australasian Fire and Emergency Service Authorities Council (AFAC) had earlier praised the firefighting efforts, with its independent report into management of the 2016 bushfires concluding:

Overall, we think that the way in which the fires were managed is a tribute to the Tasmanian fire agencies, their leadership and all personnel involved in this incident. We also recognise the very significant effort of interstate and international fire agencies that came to Tasmania's aid in circumstances that the State could not hope to manage effectively by itself.<sup>13</sup>

## Concerns about the availability and provision of resources

4.13 Some submitters and witnesses argued however that the resources had not been adequate, with fire conditions having foreshadowed well in advance a need for additional resources in the TWWHA.<sup>14</sup> Some commentary focused on future resource requirements for multiple or extensive bushfires in remote wilderness areas, while most submitters and witnesses directed their arguments toward operational matters (see below).

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10 See for example: Mr Greg Cooper, Branch Secretary, United Firefighters Union of Australia–Tasmania Branch (United Firefighters Union (Tasmania), *Committee Hansard*, Launceston, 2 November 2016, p. 25; Mr Vica Bayley, Campaign Manager, The Wilderness Society Tasmania, *Committee Hansard*, Launceston, 2 November 2016, p. 37.

11 AGD, *Submission 2*, p. 5.

12 Tasmanian Government, *Submission 24*, p. 5. Also see: NAFC, *Submission 18*, p. 4; McDermott Aviation, *Submission 15*, p. 1.

13 AFAC, 2016 Independent Operational Review, Prepared for Tasmania Fire Service, Forestry Tasmania and Parks and Wildlife Service Tasmania, April 2016, p. 4 (accessed 4 November 2016).

14 See for example: Mr Rob Blakers, *Submission 21*, p. 2; Tasmanian Greens, *Submission 22*, p. 4.

### ***Future human resource capacity***

4.14 The committee heard that there is a need to enhance Tasmania's firefighting capacity in remote wilderness areas. The United Firefighters Union of Australia–Tasmania Branch (United Firefighters Union (Tasmania)) described a limited capacity for the Tasmania Fire Service (TFS) to 'respond to major incidents such as the bushfires of Jan 2016'. It argued that the situation is exacerbated by the loss of permanent field-based Forestry Tasmania employees.<sup>15</sup>

4.15 Dr Thornton, Chief Executive Officer of the Bushfire and Natural Hazards Cooperative Research Centre (BNH CRC), noted that professional and volunteer firefighters 'only have a finite number of hours over the summer period to give and...these need to be managed with care lest they be spread too thinly'.<sup>16</sup>

4.16 Mr Vica Bayley, Campaign Manager for The Wilderness Society (Tasmania), contended that volunteer firefighters could be further utilised in remote area firefighting:

Volunteerism is obviously deeply ingrained in our fire service across the state, with country volunteer fire brigades. And there is absolutely no reason that could not be extended to volunteer crews. With the right training, there are adequately fit, knowledgeable and passionate Tasmanian people who know these places and who, with the right training and the right guidance, could contribute to the remote area firefighting efforts as do volunteers in an urban or a country sense.<sup>17</sup>

4.17 Mr Greg Cooper from the United Firefighters Union (Tasmania) advised that there are about 3000 volunteer firefighters in Tasmania, with capacity to respond to bushfires. However, he also highlighted that is not reasonable to expect these firefighters to commit to extending firefighting operations:

You can expect somebody that is getting paid to be committed, because when their time comes they change over and someone else tags in and off they go...A volunteer firefighter is somebody that has a job, probably. They may be retired but normally they have a job. And they have a family. They commit their time to be a volunteer. You cannot expect them to commit over time—like does happen—for weeks on end to be able to do this type of work.<sup>18</sup>

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15 United Firefighters Union (Tasmania), *Submission 34*, pp. 3, 19 and 28. Also see: Mr Greg Cooper, Branch Secretary, United Firefighters Union (Tasmania), *Committee Hansard*, Launceston, 2 November 2016, p. 26.

16 Dr Richard Thornton, Chief Executive Officer, Bushfire and Natural Hazards Cooperative Research Centre (BNH CRC), *Committee Hansard*, Launceston, 2 November 2016, p. 21.

17 Mr Vica Bayley, Campaign Manager, The Wilderness Society Tasmania, *Committee Hansard*, Launceston, 2 November 2016, p. 41.

18 Mr Greg Cooper, Branch Secretary, United Firefighters Union (Tasmania), *Committee Hansard*, Launceston, 2 November 2016, p. 27. Also see p. 25. Mr Cooper queried also the number of volunteers, whose physical and mental fitness levels would be comparable to professional firefighters: see p. 29.

4.18 The United Firefighters Union (Tasmania) supported the engagement of additional TFS personnel for three new brigades.<sup>19</sup> In contrast, Professor David Bowman, a Tasmanian-based fire ecologist, suggested that additional trained firefighters might be sourced from environmental NGOs, environmental organisations and land managers from the Tasmanian Aboriginal Communities.<sup>20</sup>

4.19 Forico, manager of Tasmania's largest private landholding, suggested that adjoining land owners could also contribute more to fire management operations. Forico's submission highlighted how its involvement with various Incident Management Teams had provided critical industry intelligence, especially when those teams were staffed from interstate agencies with minimal local knowledge.<sup>21</sup>

4.20 Mr Bayley indicated that capacity for remote area firefighting is a much broader issue, suggesting that the Australian Government should 'get creative' about increased national capacity:

This is not a problem that is unique to remote areas in Tasmania; there are fires in, and there are going to be fires in, remote areas all around Australia. There is absolutely a legitimate opportunity to look at a nationally-based remote area firefighting team that can be urgently deployed to emergency situations in remote areas, irrespective of where they are, but particularly if they are in a World Heritage area.<sup>22</sup>

4.21 Similarly, Friends of the Earth submitted that the committee should consider:

...whether a new national remote area firefighting unit or capacity needs to be created, which is able to be deployed to fires in the national park and WHA estate in Australia, and Tasmania in particular.<sup>23</sup>

4.22 The committee notes the relevant findings of the 2016 Independent Operational Review:

...that in all but exceptional seasons, the domestic capability of Tasmanian services to mount a remote area response is adequate, as demonstrated by the historical record. It is reasonable, and in accordance with national

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19 United Firefighters Union (Tasmania), *Submission 34*, pp. 3 and 19.

20 Professor David Bowman, *Submission 13*, p. 3. The submission noted that training could be provided by the University of Tasmania in partnership with land management agencies, and should include 'vulnerability of the vegetation and soils in the Tasmanian Wilderness'. Also see: Mr Vica Bayley, Campaign Manager, The Wilderness Society (Tasmania), *Committee Hansard*, Launceston, 2 November 2016, p. 41, who suggested that volunteer firefighters could augment the remote area firefighting capability.

21 Forico, *Submission 14*, p. 2.

22 Mr Vica Bayley, Campaign Manager, The Wilderness Society (Tasmania), *Committee Hansard*, Launceston, 2 November 2016, p. 42.

23 Friends of the Earth Australia, *Submission 19*, p. 4.

industry practice, to turn to interstate reinforcements in the case of unusually large events such as that of early 2016.<sup>24</sup>

#### *Tasmanian Government response*

4.23 The Tasmanian Government advised that its firefighting resource level has not changed and that the number of dedicated staff has increased in the last five years. The Tasmanian Government went on to note that all of the TFS professional firefighters (312) are trained to fight fires in remote areas:

For fires in remote areas that cannot be accessed by ground:

- If aircraft can land the TFS has maintained 190 career firefighters with appropriate training for working around aircraft.
- If aircraft cannot land the TFS has maintained 80 career firefighters with the skills enter and exit from an aircraft that is hovering.<sup>25</sup>

4.24 Mr Gavin Freeman, Deputy Chief Officer of the TFS noted that, during the 2016 bushfires, Tasmania's highly specialised remote area firefighting capacity was exhausted, necessitating interstate assistance:

Because it is such a specialist area we do not expect everybody to do everything. Having said that, our career firefighters and, in fact, our volunteer firefighters are very highly trained in managing wildfires, so the actual firefighting on the ground, providing they are properly supervised and led, is not that difficult. The difficult part is getting them in and having the right level of fitness to actually undertake the task. We exhausted those and...we did have approximately 1,340 remote area firefighters come in to the state from New South Wales.<sup>26</sup>

#### *Australian Defence Force assistance*

4.25 Noting that 'international firefighters' also assisted with the 2016 bushfires response, the committee examined the human resource assistance provided by the Australian Government under COMDISPLAN.<sup>27</sup>

4.26 The AGD submitted that Australian Defence Force (ADF) personnel do not possess specialised firefighting skills, and assisted the Tasmanian 2016 bushfires

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24 AFAC, 2016 Independent Operational Review, Prepared for Tasmania Fire Service, Forestry Tasmania and Parks and Wildlife Service Tasmania, April 2016, p. 47 (accessed 15 November 2016). Also see p. 36.

25 Tasmanian Government, Department of Premier and Cabinet, answer to question on notice, p. 2, received 11 November 2016.

26 Mr Gavin Freeman, Deputy Chief Officer, Tasmania Fire Service (TFS), *Committee Hansard*, Launceston, 2 November 2016, p. 63.

27 COMDISPLAN provides for non-financial Australian Government assistance, including in the form of Australian Defence Force (ADF) support. ADF support is made available only when civilian resources are inadequate, unavailable or cannot be mobilised in time, and is limited to the current qualifications, skills and resources of the personnel: AGD, *Submission 2*, p. 2.

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effort only by transporting a portable base camp to house approximately 250 interstate firefighters in north-western Tasmania.<sup>28</sup>

4.27 Mr Mark Crowweller, Director General of Emergency Management Australia, acknowledged assistance from New Zealand military personnel. His evidence emphasised that this was not indicative of a lack of Australian resources, rather an 'interstate engagement' designed to share research, knowledge and capability (through the AIA):

It is part of that mutual exchange and cooperation that goes on...what it does not indicate is that it is expertise that Australia does not have. Australia absolutely does have it. We do not rely on New Zealand for their expertise. Some may say we do. I would challenge that. But I do understand the nature of the relationship and the need to engage New Zealand from time to time in Australian operations. From a Commonwealth perspective, we are comfortable with it because, as I said, it is seen through the lens of, really, an interstate deployment assistance arrangement. It is not organised through Foreign Affairs. It does not come through the Commonwealth government. It is an agency-to-agency relationship.<sup>29</sup>

4.28 Mr Freeman from the TFS later clarified that the New Zealand Fire Service, not the New Zealand Defence Force, responded to the request for assistance, choosing to send personnel who were also defence reservists:

Our requests to New Zealand were through the same forum as our requests to all the other states: the chief officers and commissioners forum. That came through New Zealand Fire Service, and I found out later that there were some defence reservists that were embedded within their teams. That is a matter for New Zealand, if they do that. I think they were there as firefighters first.<sup>30</sup>

4.29 Mr Crowweller noted that there is a great discrepancy between Australia and New Zealand's firefighting capacity, where Australia has a significant weight of attack that does not exist in New Zealand:

Australia's fire and emergency services personnel, both volunteer and career, account for approximately one per cent of the population, with 240,000-odd people engaged in fire and emergency services. That is a substantial resource. It is simply not necessary to train our military on something that is so well resourced in Australia. The New Zealand

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28 AGD, *Submission 2*, pp. 2 and 5.

Also see: AFAC, 2016 Independent Operational Review, Prepared for Tasmania Fire Service, Forestry Tasmania and Parks and Wildlife Service Tasmania, April 2016, p. 38, accessed 15 November 2016, which found that the ADF contribution had been 'appropriate'.

29 Mr Mark Crowweller, Director General, Emergency Management Australia, AGD, *Committee Hansard*, Canberra, 1 November 2016, p. 16.

30 Mr Gavin Freeman, Deputy Chief Officer, TFS, *Committee Hansard*, Launceston, 2 November 2016, p. 66.

authorities do not have the volunteer capacity that Australia has, nor does New Zealand have the fire intensities or fire problem that Australia has.<sup>31</sup>

4.30 The committee notes evidence given by Dr Tony Press, Chair of the Tasmanian Wilderness World Heritage Bushfire and Climate Change Research Project, that the expertise of Tasmanian fire agencies is paramount to remote area firefighting in the TWWHA:

...not only do you need physical capability but you also have to have the skills inside the agencies to be able to make a proper assessment and to respond...developing those skills is actually a long-term investment. It takes about a decade to get somebody up to the capability of being able to say, 'I can take command of this crisis and I should be able to deliver the best outcome.'

The training that is required to do that, the understanding of the area, the understanding of the values, the understanding of the fire behaviour and the understanding of how you interact with all of the other agencies is not something that you can just pick up in one place and plop it straight into the middle of the world heritage area. Even if those capabilities become available in the future inside the army or elsewhere in Australia, you still need the expertise on the ground in the [Parks and Wildlife Service, Tasmania (PWS)] and in the Tasmanian Fire Service.<sup>32</sup>

4.31 The committee also notes the observations of Mr Stuart Ellis AM, Chief Executive Officer of AFAC, about the need to 'keep the [TWWHA] as pristine as possible' and his reservations about the need to provide for a reserve capacity of ADF personnel trained for remote area firefighting:

...why would we seek to train soldiers to be firefighters when we have a capacity of firefighters three times the size of the ADF across the country and in that two-month period we did not exhaust that capacity? My other very severe concern is that we have killed 408 firefighters operationally in Australia. If the ADF have that spare capacity...to gain those competencies, that would need to be a very strong requirement and they would need to retain those skills and be practised in order that we do not put those people in jeopardy.<sup>33</sup>

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31 Mr Mark Crowweller, Director General, Emergency Management Australia, AGD, *Committee Hansard*, Canberra, 1 November 2016, p. 16.

32 Dr Tony Press, Chair, Tasmanian Wilderness World Heritage Bushfire and Climate Change Research Project, *Committee Hansard*, Launceston, 2 November 2016, p. 19.

33 Mr Stuart Ellis AM, Chief Executive Officer, Australasian Fire and Emergency Services Authorities Council, *Committee Hansard*, Launceston, 2 November 2016, p. 53. Mr Ellis conceded however that 'it would be fantastic if the ADF could come on board as well', noting that NSW has a full-time employed remote area firefighting capacity.<sup>33</sup>

### *Future aerial resource capacity*

4.32 Submitters and witnesses commented generally on the use of aerial firefighting resources, including in Tasmania during the 2015–2016 bushfire season. According to the NAFC, more than 40 specialised aircraft—such as large fixed-wing airtankers, scooping firebombing aircraft (AirTractor 802F, with a capacity of 3200 litres) and intelligence gathering aircraft equipped with infrared sensing and mapping equipment—supported firefighting efforts.<sup>34</sup>

4.33 Mr Chris Arnol, Chief Officer of the Tasmania Fire Service, explained that the classic strategy for remote area firefighting is the use of aircraft for initial attack: the aircraft hold the fire 'so that we can get the boots on the ground'. Mr Arnol advised that this national approach was used during the 2016 bushfires in the TWWHA.<sup>35</sup>

4.34 Mr Alder from the NAFC noted that the early use of aircraft maximises their benefits. He described particular challenges to the use of aircraft in Tasmania arising from the highly variable nature of fire seasons, and the sensitive vegetation types and organic soils found in the TWWHA.<sup>36</sup>

4.35 Despite these challenges, the NAFC submitted that investment in the newer generation of large fixed-wing airtankers would improve bushfire protection and provide a 'valuable capability that is complementary to existing arrangements':

Larger airtankers...provide a capability that is effective in bushfire situations where other resources may not be available, deployable or effective. This is a critical concern as these are the often fires that are likely to spread and threaten communities and environmental values. It should be recognised however, that aircraft alone will generally not extinguish small or large fires and ground resources will also be required.

...

Importantly, large fixed-wing airtankers are extremely mobile and able to quickly deploy across the country or operate effectively in multiple jurisdictions in the one day.

Given suitable funding, there is an opportunity to develop, in future years, a sophisticated national large airtanker capability for Australia.<sup>37</sup>

4.36 Mr Crosweller noted that the industry is always keen to explore the latest technologies and capabilities, but cautioned that these may not always be as suited to the Australian landscape. For example, 'the use of scooping aircraft...is a little more

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34 NAFC, *Submission 18*, p. 4; NAFC, answer to question on notice, pp. 6–10, received 11 November 2016.

35 Mr Chris Arnol, Chief Officer, TFS, *Committee Hansard*, Launceston, 2 November 2016, p. 56.

36 Mr Richard Alder, General Manager, NAFC, *Committee Hansard*, Launceston, 2 November 2016, pp. 1–3.

37 NAFC, *Submission 18*, pp. 4–5. The submission noted that the benefits to Tasmania during the 2015–2016 bushfire season have not yet been formally assessed. Also see: Dr Bob Brown, *Submission 8*, p. 1, who supported the provision of Canadian-style water bombing aircraft.

prohibitive in Australia—Bass Strait is not normally calm and the lakes on the map of Australia are usually pretty dry'.<sup>38</sup>

### **Concerns about the Tasmanian Government's response**

4.37 Submitters and witnesses expressed concern with several aspects of the Tasmanian Government's response to the 2016 bushfires in the TWWHA. These concerns are summarised below and cover matters such as timeliness, requests for assistance, and communications with stakeholders.

#### ***Timeliness of the response***

4.38 Submitters stated that the Tasmanian Government was slow to respond to a clear and unfolding crisis that had been foreshadowed by fire conditions and a history of dry lightning strike in the TWWHA.

4.39 The Wilderness Society (Tasmania) and Greenpeace Australia Pacific (Wilderness Society (Tasmania) and Greenpeace) contended that the threat to Outstanding Universal Values (OUV) in the TWWHA was 'severe and the consequences potentially catastrophic'. Consequently:

The Tasmanian Government should...have been on heightened alert for a break-out of remote-area bushfires caused by lightning strikes in the TWWHA and other remote regions in January and February 2016.<sup>39</sup>

4.40 As a landholder, Forico advised that it maintains a Fire Action Plan, and in the past three fire seasons has responded to over 270 bushfires. Forico submitted that its experienced fire staff observed several opportunities to more proactively manage the 2016 bushfires in the first fortnight—such as through active back burning and after hours fire suppression. Significantly, 'a number of opportunities to consolidate fire boundaries...were not utilised in a timely fashion, if at all'.<sup>40</sup>

4.41 Mr Rod Blakers submitted that the lack of a timely response allowed the bushfires to gain momentum, rather than being suppressed at the earliest opportunity:

When the fire reached the Central Plateau at Lake Mackenzie the prospects for its control were dramatically improved. The fire was no longer burning uphill, winds were generally light and temperatures mild, and the fuel load was a fraction of that on the forested slopes of the Fisher Valley. And yet...the fire was allowed to burn unchecked across the alpine zone for ten days, before being fortuitously extinguished by exceptionally heavy rain on the evening of 28th January.<sup>41</sup>

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38 Mr Mark Crossweller, Director General, Emergency Management Australia, AGD, *Committee Hansard*, Canberra, 1 November 2016, p. 18.

39 The Wilderness Society (Tasmania) and Greenpeace Australia Pacific (The Wilderness Society (Tasmania) and Greenpeace), *Submission 27*, p. 9. Also see: p. 10. The submission noted that these indicators were consistent with predicted effects of climate change.

40 Forico, *Submission 14*, pp. 1–2.

41 Mr Rob Blakers, *Submission 21*, p. 2.

4.42 Other submitters similarly commented on a combination of factors that prevented the 2016 bushfires from inflicting more damage than that which was sustained—such as rainfalls at the end of January and in late February, and determined firefighting efforts. For example, The Wilderness Society (Tasmania) and Greenpeace stated:

The efforts of firefighters played a significant role in eventually controlling the fires. However, had fire conditions in late January and February worsened with the hot, dry, strong northerly winds typical of that season, nothing would have stopped the island's most beautiful and ancient stands of alpine vegetation and rainforest from being incinerated.<sup>42</sup>

4.43 In contrast, some submitters and witnesses described how the Tasmanian Government had anticipated and prepared for an early fire response, particularly in terms of firefighting aircraft. Mr Alder, NAFC, told the committee that, at the start of the fire season, the government had sought access to additional aerial resources as it was 'looking like a season that had some potential'.<sup>43</sup>

4.44 McDermott Aviation, which supplied standing and additional aircraft to the NAFC, submitted that it had been called upon by the Tasmanian Government to provide an expedited and timely response during the fires:

On the evening of the 15 Jan we were asked to remain on standby at Hobart Airport past our normal standby time of 1800 to until sunset at 2050. The dry lightning hit as predicted at about 1900 and we were airborne shortly after. We all flew until sunset and were able to contain up to 6 lightning strikes in that time with effective initial intervention.

We were briefed on our return that the next day would likely be busy so to be organised early. We were soon tasked in the morning responding to further lightning strikes in the Derwent Valley, eventually overnighing in Zeehan. Over the following weeks we were tasked to various fires up and down the west coast of Tasmania.

In particular the fires that we attended in the world heritage areas were well organised by TasFire and Forestry Tasmania personnel. We were utilised in an effective and timely manner in support of ground personnel. Daily briefings, including areas of concern, names of ground personnel, radio chat frequencies and targets for the day were all discussed so that we were clear on our mission for the day.

Progress was slow but methodical. Trees were tall and the bush was thick, there was a lot of fuel on the ground and in many areas peat to contend with. We used WD881 foam in our buckets when we could, but due to the sensitive nature of the flora and fauna this was limited. We were most effective in knocking down the running fire and then providing spot drops in support of the ground crew walking the fire line in following up.

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42 The Wilderness Society (Tasmania) and Greenpeace, *Submission 27*, p. 15. Also see: Tasmanian National Parks Association, *Submission 16*, p. 2.

43 Mr Richard Alder, General Manager, NAFC, *Committee Hansard*, Launceston, 2 November 2016, p. 4.

The ground crews commented on the effectiveness of the size of bucket and the maneuverability of the helicopters in getting water through the canopy in these forested areas. This was especially evident in fires in the peat soils requiring large amounts of water (up to 20,000L in some spots) to extinguish fires burning underground.<sup>44</sup>

4.45 Mr Ellis observed that a fire's location must be known before fire suppression can commence. His evidence was that fires in the TWWHA were discovered progressively over an extended period. In addition, many of these fires were 'extremely inaccessible', meaning that firefighters were limited in terms of access for fire suppression activities.<sup>45</sup>

### ***Requests for assistance***

4.46 Some submitters questioned particularly the amount of time that it had taken the Tasmanian Government to request interstate and federal assistance.<sup>46</sup>

4.47 The Wilderness Society (Tasmania) and Greenpeace referred to a press release issued by the Tasmanian Government on 21 January (one week after the commencement of dry lightning strikes in the TWWHA), wherein Premier Will Hodgman indicated that the government had made its first request for interstate support.<sup>47</sup> The Wilderness Society (Tasmania) and Greenpeace Australia Pacific submitted:

...the request for specialist help to fight fires in wilderness areas was not made until eight days after the ignitions, and six days after government agencies knew that there were many fires in dispersed, remote terrain. The actual deployment of these interstate fire-fighters did not occur until nearly two weeks after the ignitions.<sup>48</sup>

4.48 Dr Bob Brown from the Bob Brown Foundation argued that, had assistance been requested earlier, the 2016 bushfires in the TWWHA might have been contained before they could escalate.<sup>49</sup>

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44 McDermott Aviation, *Submission 15*, pp. 2–3.

45 Mr Stuart Ellis AM, Chief Executive Officer, AFAC, *Committee Hansard*, Launceston, 2 November 2016, p. 51.

46 See for example: Tasmanian Greens, *Submission 22*, p. 3.

47 The Hon Will Hodgman, Premier, and The Hon Rene Hidding, Minister for Police and Emergency Management, '[Interstate support to assist Tasmanian fire fighters](http://www.premier.tas.gov.au/releases/interstate_support_to_assist_tasmanian_fire_fighters)', joint media release, 21 January 2016, [http://www.premier.tas.gov.au/releases/interstate\\_support\\_to\\_assist\\_tasmanian\\_fire\\_fighters](http://www.premier.tas.gov.au/releases/interstate_support_to_assist_tasmanian_fire_fighters) (accessed 21 October 2016). Resources were scoped, projected and in principle support given for inter-jurisdictional assistance on 19 January: United Firefighters Union of Australia–Tasmania Branch, *Submission 34*, pp. 12–13.

48 The Wilderness Society (Tasmania) and Greenpeace, *Submission 27*, p. 17. Also see: Friends of the Earth Australia, *Submission 19*, p. 4.

49 Dr Bob Brown, Bob Brown Foundation, *Submission 8*, p. 1.

4.49 Friends of the Earth Australia suggested that, in severe and extended fire seasons, it might even be necessary to pre-emptively request interstate assistance to protect fire sensitive vegetation:

While this is clearly expensive to maintain, this summer's fires highlight the catastrophic costs of uncontrolled fires in fire sensitive vegetation. This may require changes in how each Australian state assesses requests for support. This in turn may require intervention and co-ordination through the federal Environment Department.<sup>50</sup>

4.50 Mr Ellis advised that fire agencies project forward as much as possible and perhaps the focus on doing that was not as strong as it could have been during the 2016 bushfires. However, he also noted that, while interstate support is becoming mainstream, there is an expectation (or practice) that one state will not activate the mechanism until it has fully committed or exhausted its own resources.<sup>51</sup>

4.51 The 2016 Independent Operational Review found that the extent and magnitude of the bushfires should have been apparent by 16 January (at the earliest).<sup>52</sup> However, there was no evidence that the course of the fires would have been changed by an earlier request for interstate assistance:

Tasmania has its own, not insignificant 'first strike' capability for remote area firefighting that was deployed in a timely fashion. We have also noted that making a request for resources is one thing: receiving those resources and then deploying them to the fireline, is another.

Weather conditions on the 19th and 20th January were such that the fires already burning in the landscape expanded rapidly and indeed, a significant proportion of the damage done by the fires was done by 21 January, with fire boundaries already extensive by the 19<sup>th</sup>...Photography of the aftermath of the fires demonstrates that they burned with an intensity such that direct attack on the fires during the 19<sup>th</sup>–20th would have been impossible in many cases regardless of the resources available. Interstate resources in fact started to arrive on 23rd January, so that if the process had been brought forward by three days (the maximum we think realistic), they would not have been in Tasmania before the major run of the fires.<sup>53</sup>

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50 Friends of the Earth Australia, *Submission 19*, p. 5.

51 Mr Stuart Ellis AM, Chief Executive Officer, AFAC, *Committee Hansard*, Launceston, 2 November 2016, pp. 51 and 55.

52 AFAC, Independent Operational Review, Prepared for Tasmania Fire Service, Forestry Tasmania and Parks and Wildlife Service Tasmania, April 2016, p. 35, accessed 15 November 2016.

53 AFAC, Independent Operational Review, Prepared for Tasmania Fire Service, Forestry Tasmania and Parks and Wildlife Service Tasmania, April 2016, p. 36 (accessed 15 November 2016).

*Government responses*

4.52 Mr Freeman (who had then been Acting Chief Officer) told the committee that an alarm bell rang on 14 January when he received a report about the number of dry lightning strikes:

We had the potential for a lot of fire. The focus was very much on: what have we got and let's resource that, which we did...We needed to identify what else we had, and that just took time...we started ramping up, and it was not until around the 18th or the 19th when we had the bad fire. It took a run to Lake Mackenzie and we thought, 'This has actually got bigger than we anticipated.' We were also getting reports...saying, 'Well, we found another three fires'. It just kept mounting up, and we said, 'Okay, we've got to pull the trigger on interstate resources.'<sup>54</sup>

4.53 Mr Freeman and Mr Arnol clarified that the TFS had begun considering the need for interstate assistance within 48 hours of the first dry lightning strikes. It was then apparent that such assistance would be required:

So preliminary interstate support notifications occurred. As further fires revealed themselves, the scale of the event became fully apparent and interstate support was formally requested [on 21 January].<sup>55</sup>

4.54 Mr Freeman acknowledged that a pre-emptive request for interstate assistance could have been made. However, he advised that interstate firefighters could not then have been safely deployed:

We did not have plans and we did not know where all the fires were, nor the aircraft and the ability to fly those aircraft to get the people in.<sup>56</sup>

4.55 Mr Freeman reflected also the evidence given by Mr Ellis, AFAC, about the exhaustion of state resources preceding a request for interstate assistance:

...we needed to make sure we exhausted our own firefighters first, our own resources. Remember, there were fires still in Victoria; there were fires in South Australia at that point. In New South Wales it was a little bit quieter. Western Australia had fires. Responsibly, each chief officer needs to make sure that they really need those resources before they ask for them. We still had resources available. The other backlash that we can sometimes get, as an aside, and we got it this time: you bring in interstate resources and you have the volunteers saying, 'What about me?' There was that balance.<sup>57</sup>

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54 Mr Gavin Freeman, Deputy Chief Officer, TFS, *Committee Hansard*, Launceston, 2 November 2016, p. 69.

55 Mr Chris Arnol, Chief Officer, TFS, *Committee Hansard*, Launceston, 2 November 2016, p. 56. Also see: Mr Gavin Freeman, Deputy Chief Officer, TFS, *Committee Hansard*, Launceston, 2 November 2016, p. 66.

56 Mr Gavin Freeman, Deputy Chief Officer, TFS, *Committee Hansard*, Launceston, 2 November 2016, p. 67.

57 Mr Gavin Freeman, Deputy Chief Officer, TFS, *Committee Hansard*, Launceston, 2 November 2016, p. 67.

4.56 Mr Crowweller considered that the Australian Government's response was in line with an efficient set of arrangements that respect and anticipate severe to catastrophic conditions. Mr Crowweller added:

We had anticipated early before the season had started; we had engaged the jurisdiction in a conversation. We had put in comprehensive national arrangements in anticipation of these events that three years ago we could not see. Those arrangements were accessed and utilised—I think, to full effect—and then we stood by ready to assist the Tasmanian authorities. The minute that they put in a request, we responded. We reprioritised assets and mobilised substantial equipment very quickly to provide that assistance.<sup>58</sup>

4.57 The Tasmanian Government first requested assistance from the Australian Government on 13 February, with COMDISPLAN activated that same day.<sup>59</sup> Mr Crowweller explained that the Australian Government was approached after Tasmania had utilised significant interstate resources:

...Tasmania [was] well positioned for this. I think the planning that they had put into this fire early understood its nature, its campaign nature. They had pulled in significant resources from other states and territories to assist in planning and logistics...The conversations that were being had at the national level with commissioners and chief officers were always very much about a long campaign...it would have been surprising to see an earlier request for Commonwealth assistance, because the industry, generally speaking, regards campaign operations as fairly routine business. The capacity for logistics and supply of firefighters is quite well rehearsed.<sup>60</sup>

4.58 The committee notes Mr Crowweller's view that the lessons to be learned from the 2016 bushfires in the TWWHA do not arise from 'incompetence, a lack of attention or a lack of duty of care'. The committee notes also Mr Crowweller's view that the Australian Government 'did everything we could do'.<sup>61</sup>

### ***Communications with stakeholders***

4.59 The Tasmanian Government primarily communicated with stakeholders on the progress of the 2016 bushfires and firefighting efforts through the TFS website. Submitters and witnesses questioned the accuracy of this information and argued that the government should have been more proactive in its communications.

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58 Mr Mark Crowweller, Director General, Emergency Management Australia, AGD, *Committee Hansard*, Canberra, 1 November 2016, p. 17. Also see p. 11.

59 Mr Robert Cameron, Assistant Secretary, Crisis Management Branch, Emergency Management Australia, AGD, *Committee Hansard*, Canberra, 1 November 2016, p. 14.

60 Mr Mark Crowweller, Director General, Emergency Management Australia, AGD, *Committee Hansard*, Canberra, 1 November 2016, p. 13.

61 Mr Mark Crowweller, Director General, Emergency Management Australia, AGD, *Committee Hansard*, Canberra, 1 November 2016, pp. 17–18.

4.60 For example, The Wilderness Society (Tasmania) and Greenpeace stated that the TFS website did not present a complete picture of firefighting efforts:

...conservationists were anxiously scanning the TFS website, seeking information about the progress of fire-fighting efforts in key parts of the Mersey cluster of fires, such as the February Plains and Lake Bill. Day after day, the website indicated that no efforts were being made to contain these fires, which posed potentially catastrophic threats to Athrotaxis and other alpine vegetation in the Walls of Jerusalem and near the Overland Track....

At a briefing by PWS initiated by the Tasmanian Greens on 28 January, the Wilderness Society learned that the Lake Bill fire had been fought during this period with teams of remote-area firefighters 'and five choppers every day for the last two weeks'. It was explained that the TFS website did not 'talk' to other agencies, and so did not present a complete picture of fire-fighting efforts. TWS and [Greenpeace] found this to be an extraordinary breakdown in communications with the public.<sup>62</sup>

4.61 The Tasmanian National Parks Association representative expressed his frustration with 'the absence of any media coverage coming spontaneously from the government'.<sup>63</sup> Mr Geoff Law from The Wilderness Society (Tasmania) suggested:

...the state government should take more of a role in informing the public of what is going on, particularly when it comes to this fire-sensitive vegetation, and having a sense of the fact that there are a lot of Tasmanians who are deeply concerned about wilderness areas and the things that make Tasmania unique.<sup>64</sup>

4.62 The 2016 Independent Operational Review acknowledged these concerns, finding that a significant lesson from the bushfires concerned community engagement generally and the identification of the 'community' in that context.<sup>65</sup> In particular, the Review Team considered that more could be done to enhance environmental and conservation groups understanding of 'what firefighting tactics could achieve in wilderness areas and what responsible and safe incident management in these cases would look like'. This led to two principal conclusions:

Firstly, by engaging with these communities in advance of the fire season (should they be willing to be involved), their understanding could be improved and their feedback sought on certain issues on which they might hold expertise. Information exchange of this nature may be of value to firefighting agencies in developing incident control strategies including identifying values at risk...

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62 The Wilderness Society (Tasmania) and Greenpeace, *Submission 27*, pp 18–19.

63 See for example: Mr Nicholas Sawyer, Vice President, Tasmania National Parks Association, *Committee Hansard*, Launceston, 2 November 2016, p. 35.

64 Mr Geoff Law, Consultant, The Wilderness Society Tasmania, *Committee Hansard*, Launceston, 2 November 2016, p. 39.

65 AFAC, *Independent Operational Review*, Prepared for Tasmania Fire Service, Forestry Tasmania and Parks and Wildlife Service Tasmania, April 2016, p. 40 (accessed 15 November 2016).

The second of our conclusions related to information flow while incidents are happening. Necessarily, priority needs to be given to safety-critical messaging. But if, as was suggested to us, there was some point of contact that could take inquiries about why certain things were or were not being done—or proactively could push this information out—that could go a long way to answering questions about fire suppression, the use of interstate resources and the like that in some cases seem to us still not to have been publicly addressed to date.<sup>66</sup>

4.63 The Wilderness Society (Tasmania) and Greenpeace noted that there was a TFS liaison officer who could have resolved misunderstandings created by the TFS website. However, 'the Wilderness Society was not on its communications list...it was not approached for briefings or proactively added to distribution lists'.<sup>67</sup>

4.64 However, at the Launceston public hearing, The Wilderness Society (Tasmania) expressly acknowledged that it has now had productive discussions with the TFS and PWS. Representatives commended these agencies for improving their communications and engagement with environmental organisations. Mr Bayley added:

There are very much things that we can learn from 2016, but we are not in the space of criticising and unpacking that as a motivation; we are more about learning from them so that we can do better into the future. And it is undoubtable and undeniable that we are going to need to do better because climate change is real.<sup>68</sup>

#### *Public health impact*

4.65 Some submitters and witnesses expressed concerns about the public health impact of fires across Tasmania and in the TWWHA. These participants stated that the serious effects of smoke inhalation are under-recognised and the Tasmanian Government should do more to protect the community from these health impacts.

4.66 Cleanairtas submitted that Tasmania's health related problems are among the highest in Australia and argued that, in the case of the 2016 bushfires, long-term suffering by susceptible groups could have been significantly reduced had there been early fire suppression.<sup>69</sup>

4.67 Dr Nicole Anderson, a rural medical practitioner in north-western Tasmania, described the physical and mental health impacts on the community:

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66 AFAC, *AFAC Independent Operational Review, A review of the management of the Tasmanian fires of January 2016*, Prepared for Tasmania Fire Service, Forestry Tasmania and Parks and Wildlife Service Tasmania, April 2016, pp. 40–41 (accessed 21 October 2016).

67 The Wilderness Society (Tasmania) and Greenpeace, *Submission 27*, p. 20.

68 Mr Vica Bayley, Campaign Manager, The Wilderness Society (Tasmania), *Committee Hansard*, Launceston, 2 November 2016, p. 37. Also see: Mr Geoff Law, Consultant, The Wilderness Society (Tasmania), *Committee Hansard*, Launceston, 2 November 2016, pp. 38 and 44; Mr Rod Blakers, Consultant, The Wilderness Society (Tasmania), *Committee Hansard*, Launceston, 2 November 2016, pp. 39–40.

69 Cleanairtas, *Submission 29*, p. 2.

The fact that the fires were allowed to continue to burn meant that the area was fumigated, more or less, for about 40 days with toxic bushfire smoke. This directly impacted the health of people who had existing diseases, such as lung and heart diseases. There were people who had to move out of the area due to their illness being severely affected by the bushfire smoke...This type of bushfire smoke contains chemicals that are irritants upon contact, so healthy people who previously have not had asthma, for example, will suffer asthma. We saw quite a lot of people with eye irritation, upper mucosal irritation and lung irritation. This is something that impacted the healthy people and was a significant burden on unhealthy people in this district...That was just the physical side. Now you have the mental health side. It is well known that these events can cause PTSD, anxiety and depression, particularly if there has been significant economic loss.<sup>70</sup>

4.68 Dr Richard Thornton commented that, although the 2016 bushfires had little direct impact on urban areas, rural communities were affected:

There was major disruption to small rural communities' road and [other] transport networks and to industries such as tourism and agriculture...The dispersion of smoke impacted on communities far beyond the actual fire zone. All of this had an economic cost, mostly not easily quantified. How many tourists cancelled their holidays in Tasmania? Are 2015 wine vintages written off because of smoke-tainted grapes? What is the cost of short- and long-term health impacts from the smoke?<sup>71</sup>

4.69 Dr Anderson told the committee that, apart from the standard public health alert, there was no official communication with local medical services. She commented:

Closer collaboration with local medical services directly involved in front-line activities is not only a professional courtesy but is essential for effective management of the event, including on-the-ground real-time feedback to headquarters.<sup>72</sup>

### *Government response*

4.70 Mr Freeman responded to the concerns about communications, informing the committee that the TFS did what it believed was sufficient but now recognises that there is room for improvement:

...since 2009, fire agencies have recognised that we need to engage the community...they have to be involved. That is certainly our intention and,

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70 Dr Nicole Anderson, *Committee Hansard*, Launceston, 2 November 2016, p. 49. Also see p. 50.

71 Dr Richard Thornton, Chief Executive Officer, BNH CRC, *Committee Hansard*, Launceston, 2 November 2016, p. 21. Also see: Dr Nicole Anderson, *Committee Hansard*, Launceston, 2 November 2016, pp. 47 and 49.

72 Dr Nicole Anderson, *Committee Hansard*, Launceston, 2 November 2016, p. 48.

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going forward, we will work with all interested groups to make sure that we get it right.<sup>73</sup>

### **Prioritisation of environmental assets**

4.71 Submitters and witnesses did not question the absolute prioritisation of human life but contended that the environmental assets of the World Heritage property—such as the Pencil Pine forest in the Central Walls—should have been given greater priority.<sup>74</sup>

4.72 Friends of the Earth Australia argued that insufficient resources were available to firefighters, consequently they prioritised human assets:

...firefighting authorities—who did an incredible job of bringing these bushfires under control—needed to prioritise human assets like townships at the height of the fires. This, in turn meant that insufficient resources were available to contain many remote area fires while they were relatively small (including at Lake Mackenzie, Lake Ball and the February Plains), resulting in major damage to vegetation which is not fire adapted.<sup>75</sup>

4.73 Other submitters considered that environmental assets were not prioritised due to a lack of information about the value of those assets. An oft-cited example was back burning at Sandy Lake (near Lake Macquarie) to protect a replica hut.

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73 Mr Gavin Freeman, Deputy Chief Officer, TFS, *Committee Hansard*, Launceston, 2 November 2016, p. 60. Also see p. 66.

Also see: Mr Chris Arnol, Chief Officer, TFS, *Committee Hansard*, Launceston, 2 November 2016, p. 66.

74 See for example: Mr Nicholas Sawyer, Vice President, Tasmania National Parks Association, *Committee Hansard*, Launceston, 2 November 2016, p. 35.

75 Friends of the Earth Australia, *Submission 19*, p. 1.

**Figure 4.1: Back burning to protect the replica Sandy Lake Hut**



*Source: Rob Blakers, Submission 21, p. 7.*

4.74 The Wilderness Society (Tasmania) and Greenpeace argued that this incident appeared to be:

...a disturbing case of easily replaced, partially-built infrastructure with zero heritage value being prioritised over ancient fire-sensitive trees that are part of the Outstanding Universal Value of the TWWHA. If so, it is a violation of the Management Plan for the Tasmanian Wilderness...and a deeply concerning example of misguided priorities, misdirected resources and lack of appreciation of what values constitute World Heritage and require protection efforts.<sup>76</sup>

4.75 Mr Rob Blakers also suggested that the Sandy Lake back burn demonstrated a lack of knowledge and appreciation of World Heritage values, rather than a lack of resources:

The Sandy Lake Hut back burn highlights the perverse priorities of the fire suppression effort, where significant effort was made to protect a small, unremarkable and replaceable structure, whilst adjacent pines of great antiquity were left to burn.

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<sup>76</sup> The Wilderness Society (Tasmania) and Greenpeace, *Submission 27*, p. 21.

It is apparent that the fire agencies, both at the command centre in Hobart and on the ground, had little or no understanding of the inestimable natural values of the vegetation that was under threat. Advice on natural values was being sought from ecologists within the Tasmanian bureaucracy fully a week after the fire was first reported.<sup>77</sup>

#### *Government response*

4.76 The TFS maintained that 'it is wrong to assume that response activities were singly focused on life and property'. Mr Arnol stated that the response was based on risk assessment methodology that considered the potential growth of fires, and the assessments included high value conservation areas, as well as tourism assets and critical infrastructure.<sup>78</sup>

4.77 In relation to the Sandy Lake hut, Mr Freeman advised that a local divisional commander had assessed the situation to the best of his ability with all available knowledge. His evidence emphasised that the adjoining vegetation was already alight and not able to be saved when firefighters arrived on site:

...they had some crews in the area on a reconnaissance fight and noticed a hut and some vegetation alight. Their assessment was that the vegetation that was alight was gone, or going to go, and the hut would go as well. They could not do much in the time frame that they had—they could not do anything about the vegetation, but they thought, 'There's a structure there. If we run a bit of a line around that, we can probably stop it.' They did not stay there with it; they just did that and left.

He said at the time it was essentially a snow gum. He had no evidence of any conifer type or pencil pines there that he could see, and so they essentially did that. His assessment was that, if they had done nothing, everything was gone anyway, so he just took the opportunity to save the hut.<sup>79</sup>

4.78 The 2016 Independent Operational Review concluded that there was no evidence of institutional ignorance or disregard for environmental values in the conduct of the Tasmanian fire agencies:

Overall...the Review team is confident that Tasmanian fire agencies were appropriately sighted throughout on the need to preserve environmental and wilderness areas during the 2016 fires. This is to be expected, given the role that the PWS plays in multi-agency fire suppression planning and operations. We were impressed by the detailed knowledge of and commitment to these values demonstrated by PWS and [Forestry Tasmania]

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77 Mr Rob Blakers, *Submission 21*, p. 8.

78 Mr Chris Arnol, Chief Officer, TFS, *Committee Hansard*, Launceston, 2 November 2016, p. 56.

79 Mr Gavin Freeman, Deputy Chief Officer, TFS, *Committee Hansard*, Launceston, 2 November 2016, pp. 71–72.

staff and shared by them with staff from other Tasmanian agencies and visiting interstate firefighters.<sup>80</sup>

4.79 More generally, the Tasmanian Government explained that it uses a state-wide landscape-scale risk assessment tool (the Bushfire Risk Assessment Model (BRAM)). It discussed BRAM in the following terms:

BRAM identifies the likelihood and consequence of a fire at a particular point. The risk is determined through a qualitative risk matrix, incorporating likelihood and values at risk (consequences). The process identifies actual, not perceived, risk at a particular point. The output is represented as spatial layers that show the likelihood, values at risk and actual risk. The model uses four major elements to calculate risk:

- fire behaviour potential: the manner in which fuel ignites, flame develops, and fire spreads and exhibits other related phenomena (likelihood)
- ignition potential: the probability or chance of fire starting as determined by the presence of causative agents (likelihood)
- suppression capability: the factors and limitations that are related to the ability to contain a bushfire upon detection (likelihood)
- values at risk: a specific or collective set of natural resources and manmade improvements and/or developments that have measurable or intrinsic worth, and which could potentially be destroyed or otherwise altered by fire in any given area (consequence).<sup>81</sup>

4.80 A representative from AGD agreed that 'environmental impacts were a substantial part' of the risk assessment process for TFS. In contemporary conversations:

...never did I get a sense that [the Acting Chief Officer] did not understand or fail to appreciate the value of the wilderness area. It was very high on his priority list. I think he understood the sensitivities. He also understood the operational challenges and the risks of inserting people into that wilderness area, which is pristine and beautiful, but incredibly rugged and potentially very dangerous.<sup>82</sup>

### *Valuing environmental assets*

4.81 At the Launceston hearing, TFS representatives referred to the risk assessment methodology that is used to determine resource allocation for fire suppression activities. The committee also sought evidence from other witnesses as to how environmental assets are valued within this matrix.

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80 AFAC, Independent Operational Review, Prepared for Tasmania Fire Service, Forestry Tasmania and Parks and Wildlife Service Tasmania, April 2016, p. 27 (accessed 15 November 2016).

81 Tasmanian Government, *Submission 24*, p. 23.

82 Mr Mark Crossweller, Director General, Emergency Management Australia, AGD, *Committee Hansard*, Canberra, 1 November 2016, pp. 13–14.

4.82 Dr Thornton advised that there is no evidence base or agreed methodology to put a value on ecological and heritage values:

One of the things that became very clear in the early days, even at the Bushfire CRC, is the economics of hazards in general—what are the things we value and why do we value them—is actually fairly poorly done in Australia. It is done better in some other jurisdictions. It is about the way in which we can put a value on intangibles. We can put a value on a house. We know what it costs. We know what it is worth and what it is going to take to rebuild. We can put a value on a road, and we can put a value on a crop that might get burned. Where we really struggle is: how do we value environmental services—the importance of soils, the importance of water catchments and the importance of the carbon mitigation issues of forests, for example.<sup>83</sup>

4.83 Other witnesses' evidence illustrated this lack of agreement with reference to the TWWHA as a practical example. The TFS indicated that significant high-risk environmental assets—such as the Lake Bill fires—were given a higher rating than some other areas;<sup>84</sup> Mr Ellis, AFAC, considered that property and environment assets were equally rated in the prioritisation matrix.<sup>85</sup> The United Firefighters Union (Tasmania) considered that the TFS 'did the best it could in defining what was important and providing that response' but more work is required to determine what is important: 'it is a little bit subjective but we need to have that done, because Tasmania is unique'.<sup>86</sup>

4.84 The BNH CRC is developing a decision support tool that will enable governments to disaggregate elements of their decision-making and to try to display all the trade-offs. Models of the tool have been trialled in South Australia and Victoria, but Dr Thornton noted 'we do not know which one is going to work well'.<sup>87</sup>

4.85 Professor Bowman agreed that there is a need to 'enhance current decision support tools to help *prioritise* where fire-fighting efforts are best directed'. He added that decision-making teams should include ecological experts, to identify areas potentially threatened by fires and vulnerable to impacts by fire-fighting programs.<sup>88</sup>

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83 Dr Richard Thornton, Chief Executive Officer, Bushfire and Natural Hazards Cooperative Research Centre (BNH CRC), *Committee Hansard*, Launceston, 2 November 2016, p. 23. Also see p. 20.

84 Mr Gavin Freeman, Deputy Chief Officer, TFS, *Committee Hansard*, Launceston, 2 November 2016, p. 69.

85 Mr Stuart Ellis AM, Chief Executive Officer, AFAC, *Committee Hansard*, Launceston, 2 November 2016, pp. 52–53.

86 Mr Greg Cooper, Branch Secretary, United Firefighters Union (Tasmania), *Committee Hansard*, Launceston, 2 November 2016, p. 27.

87 Dr Richard Thornton, Chief Executive Officer, BNH CRC, *Committee Hansard*, Launceston, 2 November 2016, p. 24.

88 Professor David Bowman, *Submission 13*, p. 3 (emphasis in the original).

*Environmental input into risk assessment process*

4.86 The Department of the Environment and Energy (DEE) has previously told the Senate Environment and Communications Legislation Committee that PWS has significantly contributed to the Tasmanian risk assessment process:

...it has contributed in two ways to the decisions about the allocation of resources to fight the fires. Firstly, it has informed the Tasmanian Fire Service as to which of those—and these are my terms—'high-value environmental assets' need to be prioritised for protection based on their sensitivity to fire, and also modelling about where fire fronts are going to be moving. And, secondly, informing decisions about where the firefighting effort needs to be deployed on the basis of those same sensitivities. So looking to both the protection of assets and looking to deal with the fires posing the most imminent threat to significant environmental assets.<sup>89</sup>

*Assessment of the environmental impact*

4.87 Some submitters expressed concern about the Tasmanian Government's assessment of the environmental impact of the 2016 bushfires. These submitters argued that the threat to the TWWHA was more serious than suggested by the government, as is the damage from the fires.

4.88 The Wilderness Society (Tasmania) and Greenpeace submitted that there 'appeared to be no acknowledgment of the crisis or threat' until conservationists aired their concerns in the media on 23 January 2016.<sup>90</sup> Further, there were (initially) no public briefings by PWS and 'Government responses to public concerns about World Heritage attributes were defensive, hostile and at times sought to provoke political division'.<sup>91</sup>

4.89 The Wilderness Society (Tasmania) and Greenpeace went on to comment:

The state government sought to downplay the seriousness of the threat to World Heritage attributes by saying that the fires had burnt less than 2% of the World Heritage Area...The use of such figures demonstrated a wilful misunderstanding of the crisis. The issue being debated was not fire within the World Heritage Area per se (fire is part of the ecology of many types of vegetation within the property). The issue was the threat to ancient, fire-sensitive and irreplaceable vegetation such as *Athrotaxis*. The Tasmanian Government never seemed to understand, or at least acknowledge this point.<sup>92</sup>

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89 Mr Stephen Oxley, First Assistant Secretary, Wildlife, Heritage and Marine, DEE, *Estimates Hansard*, 8 February 2016, p. 156.

90 Also see: Tasmanian National Parks Association, *Submission 16*, p. 2; Mr Greg Cooper, Branch Secretary, United Firefighters Union (Tasmania), *Committee Hansard*, Launceston, 2 November 2016, p. 28.

91 The Wilderness Society (Tasmania) and Greenpeace, *Submission 27*, p. 20.

92 The Wilderness Society (Tasmania) and Greenpeace, *Submission 27*, p. 20.

4.90 The Wilderness Society (Tasmania) and Greenpeace stated that the fires impacted some of Tasmania's most important stands of palaeoendemic vegetation species whose OUV is protected under the Convention Concerning the Protection of World Cultural and Natural Heritage and which are not fire-adapted.<sup>93</sup> The submission noted 'if burnt by intense fires, they will not recover. The palaeoendemic species will be replaced by more fire-adapted species'.<sup>94</sup>

4.91 Professor Bowman told the committee that 'worse, these trees [Pencil Pines] are really going to struggle in a warming climate'. He warned that the cumulative impact of fires in the TWWHA will be the loss of vulnerable species:

...the harder thing to comprehend about the damage will be the fact that you have multiple fires, like this, as we would predict. That is what the climate change projections are showing us. Even if you do not have the one disastrous big fire, you will gradually start eating away at these vulnerable plant communities.<sup>95</sup>

4.92 The Australian Conservation Foundation submitted that the damage to the TWWHA was a tragedy and a 'major climate-related loss of Australia's iconic natural heritage'. The Australian Conservation Foundation added:

The fires engulfed ancient rainforests, killed native animals and destroyed sensitive alpine ecosystems and the deep peat soils on which they depend. They also polluted massive amounts of greenhouse gas emissions into the atmosphere and destroyed precious carbon sinks, contributing more to the climate change that caused them in the first place.<sup>96</sup>

4.93 The Wilderness Society (Tasmania) and Greenpeace highlighted also that the 2016 bushfires may have affected cultural heritage within and adjoining the TWWHA (the latter of which may at some point form part of the TWWHA): 'concerns about the impacts of these very intense fires on Aboriginal heritage have been expressed by the Tasmanian Aboriginal Community'.<sup>97</sup>

#### *Government response*

4.94 The Tasmanian Government presented some broad estimates of the potential impact of the bushfires on 'threatened native vegetation communities' in the TWWHA (see chapter 1). The government emphasised that this data is based on a preliminary analysis and further investigative work is required to fully understand how the fires have affected the TWWHA values:

It is likely that the total area of affected Threatened Vegetation Communities will reduce. This is because there are patches of unburnt

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93 The Wilderness Society (Tasmania) and Greenpeace, *Submission 27*, pp. 13–15.

94 The Wilderness Society (Tasmania) and Greenpeace, *Submission 27*, p. 12. Also see: BNH CRC, *Submission 4*, p. 4; Tasmanian Greens, *Submission 22*, p. 5.

95 Professor David Bowman, *Committee Hansard*, Launceston, 2 November 2016, p. 10.

96 Australian Conservation Foundation, *Submission 20*, p. 2.

97 The Wilderness Society (Tasmania) and Greenpeace, *Submission 27*, p. 11.

vegetation within the fire boundary and, in relation to impacted areas, not all have been burnt at the same level of intensity.<sup>98</sup>

### **Committee view**

4.95 The committee recognises that the Tasmanian Government is primarily responsible for responding to Tasmanian bushfires, and has a complex set of intra- and interstate, as well as national and international, arrangements to enhance its firefighting capacity. The committee heard that these arrangements were effective in responding to the 2016 bushfires in the TWWHA.

4.96 Of particular note, submitters and witnesses praised the Tasmanian fire agencies, all firefighters and support personnel for their efforts. The committee wishes also to formally acknowledge this invaluable contribution and indeed, the commitment of all fire agencies and firefighters who participate in fire management and suppression activities to protect life, the environment and property throughout Australia

4.97 In relation to lessons learned, participants argued that Tasmania needs to enhance its remote area firefighting capability. The committee agrees that, with the increasing impact of global warming, there will be a need for enhanced capability. However, rather than focus on one jurisdiction, and bearing in mind the impressive national arrangements for resource sharing, the committee considers that it would be more useful to create a dedicated national remote area firefighting capacity to supplement and work in conjunction with Australian fire agencies. The committee sees no reason why this capacity cannot be met by professional and volunteer firefighters, subject to the provision of appropriate training, equipment and support.

### **Recommendation 3**

**4.98 The committee recommends that the Australian Government, in conjunction with state and territory governments, investigate a national remote area firefighting capability, to support Australian fire agencies.**

4.99 The committee accepts that the early use of aerial resources can be invaluable to remote area firefighting. Although there are challenges to the use of aircraft in such areas, the national aerial firefighting arrangements appear sufficiently flexible to accommodate environmental and jurisdictional differences.

### **Recommendation 4**

**4.100 The committee recommends that the Australian Government commit to long-term funding for the National Aerial Firefighting Centre of an amount that is at least equal to the government's current contribution, rising in line with the Consumer Price Index.**

4.101 Participants provided useful comment on the Tasmanian Government's management of the 2016 bushfires. The committee does not intend to remark on operational matters, which are not encompassed by the terms of reference. However,

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98 Tasmanian Government, *Submission 24*, p. 7.

the committee urges the Tasmanian Government to consider the matters raised and take remedial actions where necessary, if not already addressed.

4.102 Several submitters and witnesses questioned whether the environmental assets of the TWWHA were appropriately prioritised during the 2016 bushfires. The committee is not persuaded that Tasmanian fire agencies disregarded certain assets but relied instead upon a risk assessment methodology and tool that have significant limitations. The committee reiterates its view that there is a critical need for an evidence-based fire assessment and modelling capacity in Tasmania, and the TWWHA in particular, as well as a need to better determine how environmental assets are valued.

4.103 In the context of resourcing, the committee notes the damage to fire sensitive vegetation species and organic soils in the TWWHA, with evidence received suggesting that they are not likely to recover from the damage inflicted by the fires. Combined with climate change predictions, and its implications for fire conditions across Australia, the committee considers that the Australian and Tasmanian Government should prioritise efforts to protect and conserve the World Heritage values including through increased resource funding.



## Chapter 5

### World Heritage Convention and remote area fire management

5.1 This chapter discusses Australia's obligations under the 1972 Convention Concerning the Protection of World Cultural and Natural Heritage (World Heritage Convention) in relation to the Tasmanian Wilderness World Heritage Area (TWWHA). It also comments on world best practice in remote area fire management.

#### Australia's World Heritage Convention obligations

5.2 The World Heritage Convention sets out the duties of States Parties to identify and delineate cultural and natural heritage sites, and to protect, conserve, present and transmit those sites to future generations. Article 5 outlines the measures that States Parties are encouraged to take:

- (1) to adopt a general policy which aims to give the cultural and natural heritage a function in the life of the community and to integrate the protection of that heritage into comprehensive planning programmes;
- (2) to set up within its territories, where such services do not exist, one or more services for the protection, conservation and presentation of the cultural and natural heritage with an appropriate staff and possessing the means to discharge their functions;
- (3) to develop scientific and technical studies and research and to work out such operating methods as will make the State capable of counteracting the dangers that threaten its cultural or natural heritage;
- (4) to take the appropriate legal, scientific, technical, administrative and financial measures necessary for the identification, protection, conservation, presentation and rehabilitation of this heritage; and
- (5) to foster the establishment or development of national or regional centres for training in the protection, conservation and presentation of the cultural and natural heritage and to encourage scientific research in this field.<sup>1</sup>

5.3 The World Heritage Convention establishes a process by which each State Party nominates property forming part of its cultural and natural heritage. The Intergovernmental Committee for the Protection of the World Cultural and

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1 *Convention Concerning the Protection of the World Cultural and Natural Heritage*, (23 November 1972) (entry into force 19 December 1975), Article 5, <http://whc.unesco.org/en/conventiontext/%20-%20Article1> (accessed 30 November 2016). Also see Articles 3 and 4.

Natural Heritage (World Heritage Committee) uses these inventories to establish the World Heritage List, which is updated and published at least every two years.<sup>2</sup>

5.4 Australia was the seventh State Party to sign the Convention, ratifying it in 1974,<sup>3</sup> and in 1982, the TWWHA was inscribed on the World Heritage List by the World Heritage Committee. To be included on the list, the TWWHA was determined to be a site of Outstanding Universal Value (OUV), which meets four natural and three cultural criteria.<sup>4</sup>

### **Compliance with the World Heritage Convention**

5.5 The Australian and Tasmanian Governments signed an Intergovernmental Agreement to determine their respective roles and responsibilities under the World Heritage Convention. In particular, the Australian Government delegated management responsibilities to the Tasmanian Government, the lead agency being the Parks and Wildlife Service, Tasmania (PWS).<sup>5</sup>

5.6 In relation to bushfires, Tasmania assists Australia to meet its obligations through a combination of measures. These include a management plan (*Tasmanian Wilderness World Heritage Area Management Plan 1999*), *Fire Mitigation Plans* (to reduce the occurrence and impact of fires) and specific legislation (to protect TWWHA values in relation to prescribed burning activities).<sup>6</sup>

#### ***Tasmanian Wilderness World Heritage Area Management Plan 1999***

5.7 The *Tasmanian Wilderness World Heritage Area Management Plan 1999* (the Management Plan 1999) sets out the policy framework and management prescriptions to guide management of the TWWHA for a period of 10 years.<sup>7</sup> It contains specific prescriptions which include fire management.<sup>8</sup>

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2 *Convention Concerning the Protection of the World Cultural and Natural Heritage*, (23 November 1972) (entry into force 19 December 1975), Articles 8 and 11 (accessed 30 November 2016).

3 Australian Government, [States Parties which have signed the World Heritage Convention](http://whc.unesco.org/en/conventiontext/%20-%20Article1), <http://whc.unesco.org/en/conventiontext/%20-%20Article1> (accessed 30 November 2016).

4 United Nations Educational, Scientific and Cultural Organization (UNESCO), [The Criteria for Selection](http://whc.unesco.org/en/criteria/), <http://whc.unesco.org/en/criteria/> (accessed 30 November 2016).

The Tasmanian Wilderness World Heritage Area (TWWHA) met criteria (iii), (iv), (vi), (vii), (viii), (ix) and (x): see UNESCO, [New Inscribed Properties \(1982\)](http://whc.unesco.org/en/newproperties/date=1982&mode=list), <http://whc.unesco.org/en/newproperties/date=1982&mode=list> (accessed 30 November 2014).

5 Tasmanian Government, *Submission 24*, pp. 8–9.

6 Tasmanian Government, *Submission 24*, p. 9. This section focuses only on the *Tasmanian Wilderness World Heritage Area Management Plan 1999*.

7 Parks and Wildlife Service, Tasmania (PWS), [Tasmanian Wilderness World Heritage Area Management Plan 1999](http://www.parks.tas.gov.au/file.aspx?id=6364), 1999, p. 6, <http://www.parks.tas.gov.au/file.aspx?id=6364> (accessed 30 November 2016).

8 PWS, *Tasmanian Wilderness World Heritage Area, Management Plan 1999*, 1999, p. 107 (accessed 30 November 2016).

5.8 Within this prescription, wildfire suppression is to take precedence over all other management activities. In the event of a wildfire, the Incident Controller uses a fire suppression plan to assign a priority to four objectives (life, environment, targeted fire regimes, property and infrastructure). However:

If no suppression plan is available, priorities will be set taking into account the values and assets at risk, legal requirements (such as the requirement to prevent fires escaping from the WHA) and the resources available for their protection, subject to the following qualifications where relevant:

- first priority will always be the protection of human life;
- second priority will be the protection of rare and threatened fire sensitive species and communities; and
- third priority will be the protection of substantial and valuable infrastructure.<sup>9</sup>

5.9 The Management Plan 1999 specifically states:

It is the responsibility of the [PWS], on behalf of the Commonwealth, to manage fire to meet its obligations under the World Heritage Convention, the *Fire Service Act 1979*, and common law. At some times, in some locations, these obligations are incompatible.<sup>10</sup>

5.10 The committee notes the intersection between the second priority in the Management Plan 1999 and the argument that the Tasmanian Government did not appropriately prioritise environmental assets during the 2016 bushfires in the TWWHA (see chapter 4).

#### ***Draft Tasmanian Wilderness World Heritage Area Management Plan 2014***

5.11 The Tasmanian Government noted that the Management Plan 1999 is now 'outdated'. Accordingly, a new management plan is being developed for the TWWHA (*Draft Tasmanian Wilderness World Heritage Area Management Plan 2014* (the Draft Management Plan)).<sup>11</sup>

5.12 The Tasmanian Government submitted that the Draft Management Plan is in line with existing policy and frameworks for fire management in Tasmanian Parks. The principal planning documents are: the *Fire Management Policy 2011*; the *Fire Planning Policy 2009*; and Regional Strategic Fire Management Plans.<sup>12</sup>

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9 PWS, *Tasmanian Wilderness World Heritage Area, Management Plan 1999*, 1999, p. 108 (accessed 30 November 2016).

10 PWS, *Tasmanian Wilderness World Heritage Area, Management Plan 1999*, 1999, p. 106 (accessed 30 November 2016).

11 Tasmanian Government, *Submission 24*, p. 10. Also see: Department of Primary Industries, Parks, Water and Environment (DPIPWE), [Tasmanian Wilderness World Heritage Area Management Plan Project](http://dPIPWE.tas.gov.au/conservation/tasmanian-wilderness-world-heritage-area/new-tasmanian-wilderness-world-heritage-area-management-plan), <http://dPIPWE.tas.gov.au/conservation/tasmanian-wilderness-world-heritage-area/new-tasmanian-wilderness-world-heritage-area-management-plan> (accessed 30 November 2016).

12 Tasmanian Government, *Submission 24*, p. 10.

5.13 The Draft Management Plan states that the overriding principle of the *Fire Management Policy 2011* is the prioritisation of bushfire suppression and:

...all reasonable steps will be taken to ensure that the impact of planned fires, prevention and fire-suppression activities on natural and cultural values is minimised.<sup>13</sup>

5.14 The Draft Management Plan noted that the PWS uses the Bushfire Risk Assessment Model, one element of which is 'values at risk' (see chapter 4). However, 'there is limited knowledge of the impacts of fire on some of these values and not all values are currently included'.<sup>14</sup>

5.15 The committee notes that the Draft Management Plan is in the final stages of the approval process and is likely to include recommendations from inquiries into the management of the 2016 bushfires.<sup>15</sup>

#### *Comments on the Draft Management Plan*

5.16 Some submitters and witnesses referred to the Management Plan 1999, comparing its fire management prescription for wildfire suppression with the Draft Management Plan. For example, the Tasmanian Greens pointed out that the latter document omits several explicit bushfire 'references':

- the fact some parts of the TWWHA are destroyed by fire and will not recover or regenerate;
- the need to maintain a rapid response capability;
- the need for continuing research on fire in the TWWHA; and
- the need for monitoring of the effectiveness of fire strategies.<sup>16</sup>

5.17 Similarly, The Wilderness Society (Tasmania) and Greenpeace commented on the omission of fire management prescriptions that prioritise the protection of rare and threatened fire sensitive species and communities:

The government has not explained the reason for this deletion and there seems no logical reason why such provisions shouldn't be articulated in the statutory management framework for the TWWHA. [The Wilderness Society (Tasmania) and Greenpeace] are deeply disturbed by this deletion.

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13 PWS, [Draft Tasmanian Wilderness World Heritage Area Management Plan 2014](http://iplan.tas.gov.au/Temp/TrimDownload_774628.PDF), p. 155, [http://iplan.tas.gov.au/Temp/TrimDownload\\_774628.PDF](http://iplan.tas.gov.au/Temp/TrimDownload_774628.PDF) (accessed 30 November 2016).

14 PWS, *Draft Tasmanian Wilderness World Heritage Area Management Plan 2014*, p. 155 (accessed 30 November 2016). Also see p. 10.

15 Tasmanian Government, *Submission 24*, p. 10. Also see: Mr John Whittington, Secretary, DPIPW, *Committee Hansard*, Launceston, 2 November 2016, p. 61.

16 Tasmanian Greens, *Submission 22*, p. 8. The submission notes that the plan focuses only on fuel reduction burns and fuel stove policy.

Also see: Mr Nicholas Sawyer, Vice President, Tasmanian National Parks Association, *Committee Hansard*, Launceston, 2 November 2016, p. 32.

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It appears to be another expression of the Tasmanian Government's hostility to proper protection of the natural environment.<sup>17</sup>

5.18 Mr Nicholas Sawyer from the Tasmanian National Parks Association suggested that maybe PWS 'went a bit overboard in terms of removing some of the prescriptions about fire', due to a current push to reintroduce traditional burning of country. He speculated that, if the Draft Management Plan is finalised without reintroduction of the fire management prescription, this could place at risk the OUV of the TWWHA:

It basically takes the policy imperative of protecting fire-sensitive species down a couple of rungs, if not more than that, on the priority ladder compared to what we have in the 1999 plan. If that translates on the ground in terms of firefighting resources to an equal deprioritisation of those...the next time we have a really bad fire situation it could well result in the loss of major areas of the Gondwanan vegetation that form part of the outstanding universal value of the World Heritage area.<sup>18</sup>

5.19 The committee notes that it has been recommended to the World Heritage Committee by one of its Reactive Monitoring Missions to request Australia 'to ensure that the issue of fire management is fully reflected in the revision of the draft Management Plan for the property'.<sup>19</sup>

#### *Government responses*

5.20 At the Canberra public hearing, the Commonwealth Department of the Environment and Energy (DEE) indicated that the Draft Management Plan does not sufficiently comply with the World Heritage Convention or the Australian World Heritage management principles. An officer noted however that 'the plan is still being finalised' and 'our expectation is that the plan that is finalised by Tasmania will [comply]'.<sup>20</sup>

5.21 Mr John Whittington, Secretary of Department of Primary Industries, Parks, Water and Environment (DPIPWE), confirmed that the approach to describing fire had been 'a little underdone' and will be revised in the final version of the Draft Management Plan:

...the final plan will have a little more material in there around fire planning. But certainly the position of Parks is very much around protecting the OUV of the property...suppression of fire is very much driven by the

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17 The Wilderness Society (Tasmania) and Greenpeace Australia Pacific, *Submission 27*, p. 24.

18 Mr Nicholas Sawyer, Vice President, Tasmania National Parks Association, *Committee Hansard*, Launceston, 2 November 2016, p. 35. Also see p. 34. Mr Sawyer noted that this result could contribute to species extinction in the TWWHA.

19 UNESCO, *State of conservation of properties inscribed on the World Heritage List*, WHC/16/40.COM/7B.Add, 10 June 2016, p. 81, <http://whc.unesco.org/en/sessions/40com/documents/> (accessed 30 November 2016).

20 Mr Chris Johnston, Assistant Secretary, Heritage Branch, Department of the Environment and Energy (DEE), *Committee Hansard*, Canberra, 1 November 2016, p. 10.

OUV of the property, so that is a very high priority in the mix immediately after life...[the final plan] will have a slightly more fulsome description of fire management than the previous plan and I also expect it to go to being explicit about the prioritisation of OUV.<sup>21</sup>

### **Upholding World Heritage values**

5.22 Although the Tasmanian Government is responsible for managing the TWWHA, the Australian Government is obliged as a State Party to protect the TWWHA and its World Heritage values. The obligation is given effect through the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (the EPBC Act) which requires the Australian Government to:

- use its best endeavours to ensure a plan for managing the property in a way that is not inconsistent with the World Heritage Convention and the Australian World Heritage Management principles, in co-operation with the relevant state or territory; and
- take all reasonable steps to ensure it exercises its powers and performs its functions in relation to the property in a way that is not inconsistent with:
  - the World Heritage Convention; and
  - the Australian World Heritage management principles; and
  - if the property is on the World Heritage List and a plan for managing the property has been prepared—that plan.<sup>22</sup>

5.23 In addition, section 324 of the EPBC Act enables the Australian Government to give financial or other assistance to the Tasmanian Government for the protection or conservation of the TWWHA. The state benefits from various measures, including annual funding of \$3.4 million (which is at least matched by the Tasmanian Government).<sup>23</sup> In 2015, the Australian Government committed an additional \$10.2 million over four years to strengthen management efforts.<sup>24</sup>

5.24 The DEE noted that funding priorities are discussed with the National Parks and Wildlife Advisory Council (Tas), before being submitted to the Commonwealth for review. A number of activities have been funded to increase Tasmania's capacity to manage and reduce the impacts of fires in the TWWHA.<sup>25</sup>

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21 Mr John Whittington, Secretary, DPIPWE, *Committee Hansard*, Launceston, 2 November 2016, p. 61. Also see: Ms Joanne Nathan, Director, Natural Heritage, DEE, *Committee Hansard*, Canberra, 1 November 2016, p. 19.

22 Sections 321–322 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth).

23 DEE, *Submission 23*, p. 3.

24 Tasmanian Government, *Submission 24*, p. 9.

25 DEE, *Submission 23*, p. 3; DEE, answer to question on notice, pp. 2–3, received 10 November 2016.

### ***Comment on Australia's obligations***

5.25 Submissions and evidence provided little direct comment on Australia's obligations as a State Party to the World Heritage Convention. An exception was the Tasmanian Greens, who submitted that Australia's compliance with Article 5(2)–(3) has been demonstrably 'insufficient'. The Tasmanian Greens cited especially DPIPWE's lack of resources, the evidence base for modelling, and reduced research funding.<sup>26</sup>

5.26 Another exception was the DEE which affirmed the Australian Government's commitment to supporting Tasmania to strengthen its management of the TWWHA (primarily through funding measures), and emphasised its involvement in the development of the Draft Management Plan:

The Department of the Environment has worked closely with [DPIPWE] while it reviews and revises the management plan for the Tasmanian Wilderness. In particular, the [DEE] has provided advice to [DPIPWE] on Australia's World Heritage Convention obligations and application of the Australian World Heritage management principles.<sup>27</sup>

5.27 The DEE advised that it was also active during the 2016 bushfires, maintaining contact with Tasmanian officials to ensure the Australian Government well understood the damage to the TWWHA and its World Heritage values. Reports were provided to the World Heritage Committee regarding the state of conservation. Further reports will follow once DPIPWE has completed its impact assessment and developed rehabilitation plans for the World Heritage Area.<sup>28</sup>

### **World best practice in remote area fire management**

5.28 Remote area fire management is an arduous and labour intensive activity that requires extensive training, and high levels of physical and mental fitness.<sup>29</sup> Some submitters and witnesses praised Australia for its world best practice in this area.

5.29 The Bushfire and Natural Hazards Co-operative Research Centre (BNH CRC) described Australia as 'one of the leaders in this type of firefighting...[with a] national capability that is called upon as the need arises'. Its submission highlighted especially the focus on national capabilities:

No one state can maintain all the resources required for firefighting on the worst days, as this would be cost prohibitive and wasteful. In Australia there are interstate agreements for sharing of resources, including remote

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26 Tasmanian Greens, *Submission 22*, p. 7.

27 DEE, *Submission 23*, p. 4. Also see p. 3.

28 DEE, *Submission 23*, p. 4.

29 Mr Greg Cooper, Branch Secretary, United Firefighters Union of Australia–Tasmania Branch (United Firefighters Union (Tasmania), *Committee Hansard*, Launceston, 2 November 2016, pp. 26 and 29; Mr Mark Bryce, Director (Operations), DPIPWE, *Committee Hansard*, Launceston, 2 November 2016, p. 70.

area firefighting teams. Indeed these agreements also stretch to international agreements which have included New Zealand, USA and Canada.<sup>30</sup>

5.30 Mr Mark Crossweller, Emergency Management Australia, said:

States and territories have probably the world's leading capacity in remote firefighting. Often bitter experience and loss of life have taught us how to get better at that capability. There were over 1,000 personnel in the remote area firefighting capability, as I understand it, that was put into Tasmania from adjoining states. They talk about over 2,000 rotations, so that is 1,000 people rotating at least twice and some three times. That is a substantial weight of attack in remote area firefighting capacity.<sup>31</sup>

5.31 The BNH CRC submitted that Australia's coordination of national resources, policy, practice, operations and research is 'unique' and 'world leading'.<sup>32</sup> As an example, it noted the Australian Disaster Resilience Institute (formerly the Australian Emergency Management Institute), a partnership between the Australasian Fire and Emergency Service Authorities Council, the Australian Red Cross, the BNH CRC and the Attorney-General's Department (AGD).<sup>33</sup>

#### *Areas for improvement*

5.32 Submitters and witnesses did not disagree with the assessment of Australia's world-leading position. However, detection and planned burning were highlighted as areas that could be improved for future fire management and suppression in the TWWHA.

#### *Bushfire detection*

5.33 Some submitters argued that the TWWHA needs earlier bushfire detection.<sup>34</sup> Professor David Bowman described how the dominance of combustible organic soils and large areas of closed canopy vegetation complicate the early detection of lightning fires:

Organic soils can smoulder for long periods underground before spreading under favourable (favourable or unfavourable?!) fire weather conditions. Closed canopies can obscure small surface fires. Detection of fires in trackless areas is difficult and relies on *aerial surveillance and remote sensing*.<sup>35</sup>

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30 Bushfire and Natural Hazards Co-operative Research Centre (BNH CRC), *Submission 4*, p. 3.

31 Mr Mark Crossweller, Director General, Emergency Management Australia, Attorney-General's Department (AGD), *Committee Hansard*, Canberra, 1 November 2016, p. 10.

32 BNH CRC, *Submission 4*, p. 3. Also see: Mr Mark Crossweller, Director General, Emergency Management Australia, AGD, *Committee Hansard*, Canberra, 1 November 2016, p. 11.

33 BNH CRC, *Submission 4*, p. 3. The Australian Disaster Resilience Institute aims to deliver improved practices and outcomes through the delivery of a range of education, professional development and information sharing programs and services across Australia.

34 See for example: Tasmanian Greens, *Submission 22*, p. 5; Cleanairtas, *Submission 29*, p. 3, which referred to real time data provided by Global Position and Tracking System Pty Ltd.

35 Professor David Bowman, *Submission 13*, p. 2 (emphasis in the original).

5.34 However, AGD, DPIPWE and Professor Bowman noted that aerial surveillance can be problematic, due to hazardous flying conditions and concealment by cloud cover. Instead, Professor Bowman suggested that there is greater scope for improved lightning detection networks, which can then be surveilled by drones.<sup>36</sup>

5.35 AGD and BNH CRC are considering the use of drones in fire management. However, there might be some unresolved issues with this technology. Mr Crowweller, AGD, explained:

How do you incorporate those technologies into operations? It is one thing to get a picture, but it is another thing to bring it in in an intelligent way that makes sense to the operational commanders and can be interpreted properly.<sup>37</sup>

5.36 An officer from DPIPWE commented that any remote area technology that can help detect bushfires would be helpful, as time had been lost in trying to detect the 2016 bushfires in the TWWHA:

Part of the delay was we had two or three days where there was smoke reported but no follow-up flame. We were flying around in helicopters and spotter flights to try and identify if there was fire, how big it was and could we do anything about it? We had drizzle, low cloud and some patches of rain during those first few days, so it was very difficult to identify those. There was not enough heat being put out by the fires, so you could not even use an infrared scan to pick them up. So a hell of a lot of time was spent just trying to identify did we have a problem or didn't we?<sup>38</sup>

#### *Planned burning operations*

5.37 Fire management in the TWWHA is logistically challenging, due to a multiplicity of factors—remoteness, terrain, weather, the occurrence of organic soils, closed canopy vegetation and a paucity of maintained fire breaks.<sup>39</sup> In these conditions, some submitters and witnesses indicated that there is a need for more planned burning operations.

5.38 The National Aerial Firefighting Centre observed that, although a 'proven, efficient and cost-effective technique' for fire suppression, firefighting aircraft have

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36 Professor David Bowman, *Submission 13*, p. 2. Also see: Mr Mark Crowweller, Director General, Emergency Management Australia, AGD, *Committee Hansard*, Canberra, 1 November 2016, p. 13; Mr Mark Bryce, Director (Operations), DPIPWE, *Committee Hansard*, Launceston, 2 November 2016, p. 64.

37 Mr Mark Crowweller, Director General, Emergency Management Australia, AGD, *Committee Hansard*, Canberra, 1 November 2016, p. 18.

38 Mr Mark Bryce, Director (Operations), DPIPWE, *Committee Hansard*, Launceston, 2 November 2016, p. 64. Also see: Mr Gavin Freeman, Deputy Chief Officer, TFS, *Committee Hansard*, Launceston, 2 November 2016, p. 68.

39 See for example: McDermott Aviation, *Submission 15*, p. 3.

limitations—such as that they are usually effective only when used in a coordinated effort with ground crew.<sup>40</sup>

5.39 Dr Andrew Sullivan from the Commonwealth Scientific and Industrial Research Organisation (CSIRO) similarly indicated that aerial fire suppression becomes pointless without ground crew activity once fire intensity reaches a maximum limit:

Once a forest fire gets to a point where it starts throwing spots, the ability of the aerial suppression to actually control the fire drops off. Even below that limit, aerial suppression will not extinguish a fire without having somebody on the ground to put the fire out. Aerial suppression will knock the flames down and reduce the intensity for a short period, and that can enable somebody to go in and put the fire out. But after that period of time, the fire will then build back up again if there is nobody there to put the fire out.<sup>41</sup>

5.40 Professor Bowman warned that traditional methods of fire suppression can be ineffective in the TWWHA. In the case of:

- water bombing—peat (organic soil) fires can burn underground for many weeks;
- firebreaks—the remote and intractable terrain prevents the use of heavy machinery in most areas; and
- digging trenches—causes significant and ongoing environmental impacts.<sup>42</sup>

5.41 Professor Bowman supported the creation of firebreaks through planned burning operations to reduce the areal extent of landscape fires, in particular elective and careful planned burning of treeless buttongrass moorlands. He noted:

There is evidence that fires burning under moderate fire weather conditions will stop on recently burnt buttongrass moorlands. Targeted burning of buttongrass moorlands is therefore a critical preventative methodology to reduce the extent of large fires.<sup>43</sup>

5.42 Professor Bowman argued that ground crews should conduct these burns, as they have greater situational awareness and the ability to work under a wide range of weather conditions, compared to aerial burns. He suggested:

There is scope to use properly trained remote area fire-fighting personnel (possibly drawn from NGOs and Tasmanian Aboriginal Communities with

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40 National Aerial Firefighting Centre, *Submission 18*, p. 3. Also see: McDermott Aviation, *Submission 15*, p. 3, which commented on the significant impact of early aerial fire suppression.

41 Dr Andrew Sullivan, Principal Research Scientist and Team Leader, Bushfire Behaviour and Risks, CSIRO, *Committee Hansard*, Canberra, 1 November 2016, p. 8. Also see: Mr Greg Cooper, Branch Secretary, United Firefighters Union (Tasmania), *Committee Hansard*, Launceston, 2 November 2016, p. 27.

42 Professor David Bowman, *Submission 13*, p. 3.

43 Professor David Bowman, *Submission 13*, p. 3. Also see p. 1.

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a stake in land management) working outside the fire season to undertake such targeted burning.<sup>44</sup>

### **Committee view**

5.43 As a State Party to the World Heritage Convention, Australia has obligations in respect of the natural and cultural heritage of the TWWHA. While certain responsibilities have been delegated to the Tasmanian Government, the Australian Government ultimately remains responsible for the protection, conservation, etc. of the World Heritage property.

5.44 Based on the information received, it would appear that the Australian Government is complying with its World Heritage Convention obligations. There appeared to be a prompt response to the 2016 bushfires in the TWWHA, in line with emergency management arrangements; and the DEE works closely with DPIPWE in relation to management of the TWWHA, most notably in the recent preparation of a new management plan that complies with the international obligations. Further, the Australian Government provides funding in a number of areas—such as management, research and national aerial firefighting capability.

5.45 However, the 2016 bushfires in the TWWHA have helped to highlight that, in the absence of the public spotlight, there are matters that have not received sufficient attention and that are only now being recognised and addressed.

5.46 While the Tasmanian Government appears to have been properly more engaged in the routine management of the TWWHA, in the committee's view the Tasmanian and Australian Governments should be working together at a strategic level to protect and conserve this valuable wilderness area. At present, there appears to be a slight tendency for the Australian Government to delegate much of the responsibility to the Tasmanian Government.

5.47 The committee considers that this is not satisfactory and the Australian Government should have a greater role in supporting the Tasmanian Government to fulfil Australia's World Heritage Convention obligations. Accordingly, the committee makes the following recommendations.

### **Recommendation 5**

**5.48 The committee recommends that the Australian Government recognise the need to enhance protection and conservation efforts in the Tasmanian Wilderness World Heritage Area by allocating increased funding:**

- **to the Parks and Wildlife Service, Tasmania, for appropriate management activities and resources; and**
- **for research projects aimed at providing qualitative and quantitative data specific to climate-related and ecological threats to the Tasmanian Wilderness World Heritage Area (such as dry lightning strike).**

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44 Professor David Bowman, *Submission 13*, p. 3. Also see The Wilderness Society (Tasmania) and Greenpeace, *Submission 27*, p. 25.

**Recommendation 6**

**5.49** The committee recommends that the Australian and Tasmanian Governments:

- **develop options to increase co-operation to ensure that the Tasmanian Wilderness World Heritage Area is protected and conserved in line with Australia's obligations under the World Heritage Convention; and**
- **work together to ensure strong provisions to protect the Tasmanian Wilderness World Heritage Area from bushfire risks are included in the *Tasmanian Wilderness World Heritage Area Management Plan*.**

**Senator Nick McKim**

**Chair**

# Coalition Senators' Dissenting Report

1.1 Coalition Senators support the comments in the majority report regarding the invaluable contribution and commitment of all agencies and firefighters who were engaged in the firefighting efforts during the January and February 2016 Tasmanian bushfires. Without their outstanding effort in a challenging environment the destruction caused by the fires would have been more widespread. Coalition Senators note that despite the significance of the event not one life or property was lost. We also note that Tasmania has withstood more significant fire events in the past.

1.2 Coalition Senators provide the following comments in relation to the majority report recommendations.

## Recommendation 1

### 2.45 The committee recommends that the Australian Government:

- **recognise that climate change has increased fire conditions in south-eastern Australia and the risk to natural and cultural values in the Tasmanian Wilderness World Heritage Area; and**
- **report annually to the World Heritage Committee on the state of conservation in the Tasmanian Wilderness World Heritage Area.**

1.3 Coalition Senators acknowledge and *accept* the potential future impacts of climate change in managing fire in Australia, including in Tasmania. The Australian Government invests through programmes such as the National Landcare Programme to improve natural resource management and landscape resilience, including in the face of climate change pressures.

1.4 Coalition Senators *do not accept* the recommendation to report annually to the World Heritage Committee on the state of conservation in the Tasmanian Wilderness World Heritage Area. State of Conservation reporting is a formal process which is only required where the World Heritage Committee has serious concerns about the state of a particular World Heritage property. In July 2016, following the successful 2015 World Heritage Reactive Monitoring Mission visit, the World Heritage Committee announced its positive decision on the state of conservation of the Tasmanian Wilderness World Heritage Area. The decision acknowledged the progress that Australia has made on addressing past requests of the World Heritage Committee, and commended the commitment of the Australian and Tasmanian Governments in accepting all 20 recommendations of the monitoring mission to the property.

## **Recommendation 2**

### **3.38 The committee recommends that the Australian Government, in cooperation with the Tasmanian Government:**

- **recognise the need to identify the ecological and biodiversity impacts of fire on fire sensitive vegetation communities, organic soils and endemic fauna species in the Tasmanian Wilderness World Heritage Area; and**
- **allocate long-term funding to the Commonwealth Scientific and Industrial Research Organisation and/or the Tasmanian Government to assist with the development of fire assessment and modelling specifically suited to the Tasmanian Wilderness World Heritage Area.**

1.5 Coalition Senators make the following comments in relation to Recommendation 2 of the majority report.

1.6 The need to identify the ecological and biodiversity impacts of fire on fire-sensitive vegetation communities, organic soils and endemic fauna species in the Tasmanian Wilderness World Heritage Area is an important foundation for effectively managing the Property. Responsibility for this work lies with the State Government as the Property manager.

1.7 The Tasmanian Government is spending \$250,000 to examine the impact of climate change in the World Heritage Area and strengthen fire-fighting techniques to protect the property. This research project was initiated by the Tasmanian Government. Coalition Senators understand this work will be finalised in the near future.

1.8 The Australian and Tasmanian Governments are delivering improved outcomes for the Tasmanian Wilderness using an additional \$10.2 million provided by the Commonwealth for the identification, protection, conservation, presentation and rehabilitation of the World Heritage values of the property. This funding is in addition to the \$3.4 million per year baseline funding provided between 2013 and 2018 to assist with the management of the property.

1.9 In terms of investment through CSIRO, the Australian Government is overseeing an increase in expenditure by CSIRO by \$100 million between now and 2019. CSIRO is on track to receive \$5.4 billion over the next four years, including \$3.257 billion from the Australian Government.

1.10 In 2015–16, CSIRO invested around \$100 million in climate research, comprising over \$54 million on mitigation research, over \$10 million on adaptation research and \$29 million on research to better understand the Climate.

1.11 CSIRO is recognised as a world leader in fire behaviour research and continues to define, lead and directly invest in critical research focussed on improving the management and suppression of bushfires, allowing CSIRO to provide expertise and advice to various governments, agencies and the public across Australia. CSIRO

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bushfire research covers bushfire management strategies; post-bushfire survey investigations; climate modelling projections; and, development of disaster management software tools.

### **Recommendation 3**

**4.98 The committee recommends that the Australian Government, in conjunction with state and territory governments, investigate a national remote area firefighting capability, to support Australian fire agencies.**

1.12 Coalition Senators do not support Recommendation 3 of the majority report.

1.13 Under Australia's constitutional arrangements, state and territory governments have primary responsibility for protecting life and property, including responding to bushfires and providing assistance for disaster affected communities. Each state and territory has emergency management legislation, plans and arrangements to respond to emergencies. The Australian Government supports state and territory governments by coordinating national efforts in building resilience through disaster research, information management and mitigation policy and practice.

1.14 Where the scale of an emergency or disaster exceeds or exhausts jurisdictional response capacity and capability, or where resources (government, community and/or commercial) cannot be mobilised in time, a state or territory may seek Australian Government assistance. The Australian Government Disaster Response Plan (COMDISPLAN) (activated by the Director General EMA [DG EMA]), facilitates the provision of non-financial Australian Government assistance to Australian states and territories, following a formal request for assistance by a state or territory. This assistance can include for example, but is not limited to, Australian Defence Force (ADF) support, satellite imagery capabilities, Australian Medical Assistance Teams and disaster victim identification.

1.15 Where civilian resources are inadequate, unavailable or cannot be mobilised in time, emergency Defence Assistance to the Civil Community (DACC) arrangements enable the ADF to contribute to save human life, alleviate suffering and prevent loss of animal life or property. Defence assistance follows a request from the relevant state or territory government to EMA in accordance with COMDISPLAN. In some circumstances, ADF support to states and territories can be approved by local ADF commanders. As a general principle, Defence support is limited to the current qualifications, skills and resources of the ADF. Firefighting, from either the ground or air, is a specialised skill that requires equipment and training that the ADF does not possess and which remains the responsibility of state and territory governments.

1.16 EMA can also support the coordination of resources between states and territories. This can be facilitated under the Arrangements for Interstate Assistance (AIA) and through the Commissioners and Chief Officers Strategic Committee (CCOSC) of the Australasian Fire and Emergency Services Authorities Council (AFAC), which is co-chaired by DGEMA, and in which all states and territories participate. The AIA enables Australian states and territories to exchange capabilities

(fire services, emergency services and land management agencies) during significant incidents. The CCOSC comprises Chief Officers and Commissioners from Australia and New Zealand fire and emergency services agencies. The CCOSC was established in December 2013 to provide expert operational advice on national issues. The CCOSC can coordinate national operational matters during significant events and provide an operational reference group for multi-jurisdictional response arrangements.

#### **Recommendation 4**

**4.100 The committee recommends that the Australian Government commit to long-term funding for the National Aerial Firefighting Centre of an amount that is at least equal to the government's current contribution, rising in line with the Consumer Price Index.**

1.17 Coalition Senators make the following comments in relation to Recommendation 4 of the majority report.

1.18 The Commonwealth provides \$14.8 million each year to the National Aerial Firefighting Centre (NAFC) to assist with the costs of leasing specialised bushfire fighting aircraft and on 29 December 2015, the Prime Minister committed to a further, one-off \$0.5 million to the NAFC to support the extension of some of these leases for the 2015-16 fire seasons. This additional funding was provided to NAFC on 13 April 2016. Aircraft leased under these arrangements were utilised in the response to these fires.

1.19 Given the very high cost of developing and maintaining specialist firefighting aircraft and the finite duration of the Australian fire season, the NAFC leases rather than purchases an aircraft fleet. Leasing aircraft allows (i) adjustments to be made to resourcing levels based on assessed risk and (iii) greater flexibility to introduce new technology.

1.20 The NAFC, in conjunction with all states and territories, monitors emerging capabilities and has an established multi-jurisdictional working group to closely assess the technical and economic aspects of its fleet. Aircraft selection is based on advice from state and territory experts and is underpinned by over 60 years of research in Australia. The NAFC also continues to work closely with overseas organisations involved in the evaluation of aerial firefighting capabilities.

1.21 In addition to the Tasmanian NAFC contracted aircraft, in excess of 20 NAFC contracted aircraft from mainland Australia were deployed to Tasmania. This fleet consisted of aircraft which remained under contract with NAFC, as well as those which were reengaged on an ad-hoc basis following the expiry of their contracts (the department does not have specific figures relating to this fleet as this detail is not currently available to NAFC). In addition to these aircraft, a Very Large Air Tanker (VLAT) and Large Air Tanker (LAT) from New South Wales, and two LATs from Victoria, conducted fire-bombing sorties in Tasmania.

1.22 Coalition Senators note that ongoing support for the NAFC will continue to be managed through normal Budget processes.

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## Recommendation 5

**5.48 The committee recommends that the Australian Government recognise the need to enhance protection and conservation efforts in the Tasmanian Wilderness World Heritage Area by allocating increased funding:**

- **to the Parks and Wildlife Service, Tasmania, for appropriate management activities and resources; and**
- **for research projects aimed at providing qualitative and quantitative data specific to climate-related and ecological threats to the Tasmanian Wilderness World Heritage Area (such as dry lightning strike).**

1.23 Coalition Senators make the following comments in relation to Recommendation 5 of the majority report.

1.24 As stated under Recommendation 2, it is important to note the Australian Government is providing an additional \$10.2 million for the identification, protection, conservation, presentation and rehabilitation of the World Heritage values of the property. This funding is in addition to the \$3.4 million per year baseline funding provided between 2013 and 2018 to assist with the management of the property.

1.25 The Tasmanian Government is spending \$250,000 to examine the impact of climate change in the World Heritage Area and strengthen fire-fighting techniques to protect the property. This research project was initiated by the Tasmanian Government. Coalition Senators understand this work will be finalised in the near future.

1.26 As referred to under Recommendation 2, the Australian Government is overseeing an increase in expenditure by CSIRO by \$100 million between now and 2019. CSIRO is on track to receive \$5.4 billion over the next four years, including \$3.257 billion from the Australian Government. A substantial amount of this investment is being directed to research to better understand climate change impacts, landscape adaptation and bushfire management.

1.27 Coalition Senators acknowledge the importance of qualitative and quantitative data in managing landscapes across Australia, including in Tasmania.

## Recommendation 6

**5.49 The committee recommends that the Australian and Tasmanian Governments:**

- **develop options to increase cooperation to ensure that the Tasmanian Wilderness World Heritage Area is protected and conserved in line with Australia's obligations under the World Heritage Convention; and**
- **work together to ensure strong provisions to protect the Tasmanian Wilderness World Heritage Area from bushfire risks are included in the *Tasmanian Wilderness World Heritage Area Management Plan*.**

1.28 Coalition Senators do not support Recommendation 6 of the majority report.

1.29 Coalition Senators are confident the two Governments are meeting their obligations under the World Heritage Convention. Indeed, the World Heritage Committee has acknowledged in July 2016 the progress Australia has made on addressing past requests of the World Heritage Committee, and commended the commitment of the Australian and Tasmanian Governments in accepting all 20 recommendations of the 2015 monitoring mission to the property.

**Senator James Paterson**  
**Deputy Chair**  
**Senator for Victoria**

**Senator Jonathon Duniam**  
**Senator for Tasmania**

**Senator David Bushby**  
**Senator for Tasmania**

# APPENDIX 1

## Submissions, tabled documents, additional information, and answers to questions taken on notice

### Submissions

- 1 CSIRO
- 2 Attorney-General's Department
- 3 BirdLife Tasmania
- 4 Bushfire and Natural Hazards CRC
- 5 Ms Lisa Clarkson
- 6 Mr Bob Lubout
- 7 Mr Chris Arthur OAM
- 8 Dr Bob Brown
- 9 Mr Michael Lichon
- 10 Ms Patricia Jane Wilson
- 11 Mr Ken Felton
- 12 Mr Scott Jordan
- 13 Professor David Bowman
- 14 Forico
- 15 McDermott Aviation
- 16 Tasmanian National Parks Association
- 17 Dr Jonathan Marsden-Smedley
- 18 National Aerial Firefighting Centre (NAFC)
- 19 Friends of the Earth Australia
- 20 Australian Conservation Foundation
- 21 Mr Rob Blakers
- 22 Tasmanian Greens
- 23 Department of the Environment
- 24 Tasmanian Government
- 25 Ms Deb Hunter, Friends of the Great Western Tiers Kooparoona Niara and  
Mole Creek Caving Club
- 26 Mr Peter Godfrey
- 27 The Wilderness Society (Tasmania) and Greenpeace Australia Pacific
- 28 Dr Nicole Anderson
- 29 Cleanairtas
- 30 Tasmanian Mountain Cattlemen's Association
- 31 Ms Judy Kilby
- 32 Mr George Harris
- 33 Mr Simon Warriner
- 34 United Firefighters Union of Australia–Tasmania Branch

### Form letter

- 1 Form letter: 9 received

**Tabled documents**

- The Wilderness Society (Tasmania) – Excerpts from UNESCO documentation (public hearing, Launceston 2 November 2016)

**Additional information**

- Mr Nicholas Sawyer – Photographic evidence of the inadequacies of the vegetation mapping

**Answers to questions on notice**

- CSIRO – Answers to questions taken on notice (public hearing, Canberra, 1 November 2016)
- Department of the Environment and Energy – Answers to questions taken on notice (public hearing, Canberra, 1 November 2016)
- Attorney-General's Department – Answers to questions taken on notice (public hearing, Canberra, 1 November 2016)
- National Aerial Firefighting Centre – Answers to questions taken on notice (public hearing, Launceston, 2 November 2016)
- Department of Premier and Cabinet, Tasmanian Government – Answers to questions taken on notice (public hearing, Launceston, 2 November 2016)

## **APPENDIX 2**

### **Public hearings**

**Tuesday, 1 November 2016 – Canberra**

**CSIRO**

Dr Andrew Sullivan, Principal Research Scientist and Team Leader, Bushfire Behaviour and Risks

Mr Warwick McDonald, Research Director, Water Resource Management

**Department of the Environment and Energy**

Mr Chris Johnston, Assistant Secretary, Heritage Branch

Ms Joanne Nathan, Director, Natural Heritage Section

**Attorney-General's Department**

Mr Mark Crowweller AFSM, Director General, Emergency Management Australia

Mr Robert Cameron, Assistant Secretary, Crisis Management Branch, Emergency Management Australia

**Wednesday, 2 November 2016 – Launceston**

**National Aerial Firefighting Centre**

Mr Richard Alder, General Manager

**Professor David Bowman – Private capacity**

**Dr Tony Press – Private capacity**

**Bushfire & Natural Hazards Cooperative Research Centre**

Dr Richard Thornton, Chief Executive Officer

**United Firefighters Union of Australia–Tasmania Branch**

Mr Greg Cooper, Branch Secretary

**Tasmanian National Parks Association Inc.**

Mr Nicholas Sawyer, Vice-President

**The Wilderness Society (Tasmania)**

Mr Vica Bayley, Campaign Manager

Mr Geoff Law, Consultant

Mr Rob Blakers, Consultant

**Dr Nicole Anderson – Private capacity**

**Australasian Fire and Emergency Services Authorities Council**

Mr Stuart Ellis AM Chief Executive Officer

**Tasmanian Government**

Dr John Whittington, Secretary, Department of Primary Industries, Parks, Water and Environment

Mr Mark Bryce, Director (Operations), Department of Primary Industries, Parks, Water and Environment

Ms Shona Prior, Assistant Director, Department of Premier and Cabinet

***Tasmania Fire Service***

Mr Chris Arnol, Chief Officer

Mr Gavin Freeman, Deputy Chief Officer