Bushfire Arson: A Review of the Literature

Matthew Willis

ACT Department of Justice & Community Safety

bushfire CRC

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Foreword

Bushfires are a fact of life in Australia. Much of the nation's population lives in areas where the threat of bushfire is an ever present reality and many Australians have been touched in some way by the destructive force of bushfires. The costs of a bushfire can be enormous – lost lives, homes, buildings, infrastructure, livestock, damage to the environment and wildlife. On top of these losses comes the costs of resources involved in managing and responding to fire incidents, not least of which is the effort contributed by professional and volunteer members of fire and land management services.

Alongside the threat of bushfires comes the realisation that some of these fires are deliberately lit. As communities struggle to come to terms with the effects of a damaging fire, they can be left angry and bewildered by the knowledge that someone may have consciously raised the fire that has taken away their homes, their livelihoods, perhaps even their friends and loved ones.

We need to understand more about why people light bushfires. Not just to give explanations to devastated communities, but so those involved in managing our lands and confronting the threat of deliberately lit bushfires can be better equipped to reduce the impact of those fires. Reducing the impact of deliberately lit bushfires requires tackling the problem on a number of fronts. Police, fire services and land management agencies are increasingly building well trained and resourced investigation teams which specialise in investigating the causes of bushfires and identifying those who may have been responsible for them. The investigative effort can be helped by a better understanding of the motives and profiles of those lighting the fires. This knowledge can also help to shape treatment and management programs for convicted offenders that will reduce the likelihood of them lighting fires again in the future. Knowing why people decide to start a fire in a particular place at a particular time, agencies can better apply their limited resources to planning for fire outbreaks and even preventing some of them from occurring.

This report draws together the major literature on arson, focusing on motives and treatment of offenders. Using knowledge gained from studies of general arson, the report provides a firm platform for further research and for building solutions to the problem of bushfire arson. Drawing on this knowledge will help all those working in this diverse and challenging field to build the programs and policies needed to minimise the chance that deliberately lit bushfires will impact on Australian communities.

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Disclaimer

This research report does not necessarily reflect the policy position of the Australian Government.

Contents

Executive summary

Arson is the intentional and malicious lighting of a fire. It is a criminal act which has elements common to a number of criminal offences, yet has characteristics that also differentiate it. In many ways it is not an easy offence to commit, nor is it easy to investigate or prosecute. It is a crime committed frequently and one which carries a massive and uncontrolled potential for destruction and loss of life, yet many offenders are never caught or prosecuted.

Understanding why people commit antisocial acts and carry out criminal activity is important for investigating offences and ensuring that the perpetrators receive justice and appropriate management or treatment. There is an extensive literature considering the motives behind arson as well as attempts to classify and organise motives and characteristics of the offenders.

Much of the literature on arson is drawn from samples of psychiatric populations. The early literature in particular considered most arson to be the result of mental illness linked to childhood sexual development. Later research typically sought to develop classification schemes that grouped arsonists according to the motives behind their actions, though many of these schemes tended to blur distinctions between motives, characteristics of the offender and characteristics of the offence itself. More recent approaches have often deliberately tried to take these various factors into account in order to develop a psychological profile of a likely offender which can be used to target and direct investigations.

While there are many different approaches to classifying arson, and different terminology is used by different writers, when taken as a whole the literature suggests the following common motives for arson:

- revenge, usually against an employer, lover or institution;
- excitement or relief of boredom;
- vandalism, often influenced by peer pressure;
- financial gain, including insurance fraud and for other business purposes; and
- attention-seeking, including as a ‘cry for help’ or to gain recognition and ‘hero status’.

In many cases, mental illness will be a factor in the firesetting behaviour. It is often difficult to separate an illness, psychiatric disability or intellectual disability from other influences and many arsonists will be driven by a number of factors. Most arsonists exhibit present or past circumstances characterised by family and relationship problems and deficits in normal social interactions, employment and academic performance. Studies have found typical arsonists to be of limited intelligence but this finding, together with findings of other

personal and social deficits, may be more an indication of those relatively few arsonists who are convicted than the overall arsonist population. The term ‘pyromaniac’, its abbreviation ‘pyro’ and its slang derivation ‘firebug’ have an easy appeal and the terms appear frequently in common language. Despite this, and despite its existence as a psychiatric diagnosis, it seems likely that there are few true pyromaniacs or even that the diagnostic category is really a valid one.

The published literature on arson generally treats child firesetters separately from adults. A large proportion of children play with fire to some extent and most fires started by children are accidents resulting from fireplay or experimentation. A small group of children engage in problematic firesetting and a few go on to light fires regularly. Child problem firesetters are characterised by deeply troubled family backgrounds, typically involving marital breakdown and where one or more parent is absent, distant or hostile. Many children who engage in firesetting have been emotionally and physically abused or neglected. Many have been sexually abused. Abusive and troubled backgrounds can lead to problems with schooling, difficulties with peer relationships and involvement in a range of antisocial behaviours, including firesetting.

Bushfires can be started by a range of causes. Some of these are natural (such as lightning strikes) or accidental (such as campfires that spread out of control). Some bushfires are also lit deliberately for malicious reasons. The proportion of bushfires which are deliberately lit is hard to determine accurately and varies from one time and place to another. Estimates of deliberately lit bushfires range from around 20 per cent to as high as 90 per cent, with between 25 and 50 per cent being likely in most situations. Data indicate that the proportion of deliberately lit fires is increasing, though this may be an artefact of greater awareness coupled with better investigation and reporting than the result of an actual increase in arson activity.

Bushfires, whether natural, accidental or deliberate, can have devastating effects. Bushfires have claimed many lives and properties in Australia and ‘disaster-level’ bushfires cost Australia an average of $77 million a year, though this can vary markedly from one year to another. It is difficult to say with any degree of certainty what proportion of the damage caused by bushfires is attributable to arson, though arson-caused bushfires may be more likely to be lit in circumstances which will lead to them spreading and impacting on urban areas.

There are a range of environmental factors which contribute to bushfires starting in a certain place or at a certain time. Time of year, aspect and slope, type of vegetation and prevailing weather conditions can all influence the likelihood of a fire starting and spreading. There is evidence to suggest that bushfire arsonists target areas where the aspect and slope is conducive to fires becoming large and difficult to control. While there is mixed evidence from the United States and Australia on whether severe fire weather conditions

and fire bans encourage arson activity, this does appear to be the case in Australia. A finding that more fires are lit in Australia during periods of total fire ban than not, regardless of actual weather conditions, suggests that bushfire arsonists tend to become active when they believe their fires are more likely to cause problems.

Much of the literature examining the motives behind arson and profiles of the offenders has derived from the United Kingdom and United States and focuses on urban structural arson. Many of the motives applying in those settings do not arise in the same way with bushfire arson, and there is little literature that examines who lights fires in the bush or why. Based on a consideration of the total literature, a suggested typology of bushfire arson is offered, consisting of five principal types of deliberately lit bushfires:

1. bushfires lit to create excitement or relieve boredom;
2. bushfires lit for recognition and attention;
3. bushfires lit for a specific purpose or gain;
4. bushfires lit without motive; and
5. bushfires lit with mixed motives.

Most studies of arson identify a small proportion of cases where fires are lit by the very people charged with preventing and suppressing them—firefighters. Despite the phenomenon not occurring in great numbers, and especially considering the very many volunteer firefighters who provide valuable and committed service to the community, firefighter arson is considered sufficiently serious to warrant special consideration. A small number of studies have examined very closely the motives behind firefighter arson and the types of firefighters who light malicious fires. These studies suggest that firefighters are most likely to start fires to generate excitement and thereby relieve inactivity, or gain recognition or be treated as a hero for putting out the fire. Those firefighters who engage in arson are likely to be relatively new to the job and exhibit troubled family and relationship backgrounds. Most show difficulties with schooling, employment and are under significant personal stress.

Little attention has been given in the literature to the management or treatment of adult firesetters. Most writers have taken the view that interventions should be based on treating underlying psychological or psychiatric conditions, with any remaining motivations being removed through the correctional system.

There is a more significant literature on managing and treating child firesetters and most suggested interventions take into account the troubled family backgrounds and resulting interpersonal deficits that characterise many young firesetters. Most writers support the establishment of general fire education programs for young children, together with programs

for older children involving education, awareness, treatment of underlying problems and building of interpersonal skills. There has been a number of educational and treatment programs developed to assist young firesetters in the UK, US and Australia and a number of writers have proposed best practice guidelines for juvenile programs. Targeting interventions to a child's particular needs and the involvement of a broad range of social agencies are features of best practice in this area.

As is the case in other areas of the arson literature, material on preventing arson is usually based on urban structural arson and incorporates approaches such as improving the design, materials, security and fire-protection infrastructure of buildings. Recommendations for preventing bushfire arson are limited but focus on behaviour change through education, raising community vigilance and awareness and improved planning and risk analysis. It is unlikely that harsher sentences for convicted arsonists, though popular with the general community, will deter others from starting bushfires.

A good deal more work has been done on ways of preventing firefighter arson. Prevention usually takes two approaches: the use of training to discourage arson by building an understanding of the problem and its consequences; and the use of background checks and screening tools to prevent those exhibiting arson risk factors from joining the fire service. Background checks and screening tools, though likely to be effective in reducing the problem at least to some extent, can be expensive and difficult to implement.

While this paper provides a fundamental basis for understanding bushfire arson, a good deal more work is needed in the future to build on this understanding and apply it to practical measures that will help address the problem. Ten suggestions are made for future work directions in this area:

1. further develop and refine a typology and profile specific to bushfire arson offenders;
2. conduct research with convicted bushfire arson offenders to understand their motives, methods and opinions;
3. map bushfire arson-related data collections across Australia – gather data together as much as possible and analyse it to improve understanding of patterns of offending;
4. analyse gathered bushfire data to improve our understanding of the incidence of bushfire arson and to identify geographic and socioeconomic patterns in its occurrence;
5. examine treatment programs and interventions suitable for adult bushfire arson offenders;

6. draw on the expertise of specialist bushfire arson investigators to develop best practice guidelines for investigation of bushfire arson offences;
7. examine issues surrounding prosecution of bushfire arson offences with a view to assisting prosecution of these cases;
8. further examine and develop preventive measures applicable to bushfire arson;
9. examine and analyse the application of psychological screening tools for the selection of paid and volunteer firefighters; and
10. develop a model for determining the costs of bushfire arson in Australia.

Introduction

Most people reading this paper will be only too aware that Australia is one of the most fire-prone countries on earth. The climate, topography, geography and vegetation combine to ensure that large bushfires are a feature of the Australian summer. Fires burning in remote bush areas can have a range of impacts on the environment and on the services needed to control them. Sometimes these fires can have tragic impacts, the worst being the loss of human lives as the inherent unpredictably of a raging bushfire turns on those trying to control it. Australia's relationship with the bush means that many people live in close proximity to dense bushland, and when bushfires reach into urban areas the consequences can be devastating.

While it may be difficult on one level to accept, the reality is that some of these bushfires, including some of the most tragic ones, are deliberately lit. For whatever reason, some people make a conscious decision to let loose the destructive force of a fire in the bush. Sometimes they are caught, often they are not. Sometimes the fire will fail to spread, or will be controlled quickly by fire crews. There are also those deliberately lit fires that rage out of control and only the massed efforts of firefighters and their supports, or perhaps just plain good luck, prevent homes and lives being lost. Just sometimes, best efforts and good luck fail and death, destruction, disbelief and anger follow.

By understanding more about why people start fires in the bush, we can work towards finding ways of reducing the impacts of deliberate firelighting. Understanding more about the motives underlying bushfire arson and ways of managing and treating its perpetrators allows us to work on ways of more easily identifying the people who are lighting the fires. This may give us a greater chance of finding the culprits, bringing them to justice and trying to stop them from lighting fires in the future. In some cases it may prevent the fires being lit in the first place. With a greater understanding of how, why and where bushfires are lit there comes the possibility of improving our ability to respond to the problem of bushfire arson and those who commit it.

This paper is the starting point for a research program on bushfire arson. With funding and support from the Bushfire Cooperative Research Centre and in partnership with the ACT Department of Justice and Community Safety, the Australian Institute of Criminology will conduct future research that aims to increase our understanding of bushfire arson and provide stakeholders with resources to deal with it. The review of the relevant literature in this paper will provide a firm basis for bringing together knowledge on the topic and will underpin these future research activities.

Reading this paper, it will soon become apparent that there is only a fairly small literature on arson in Australian bushland environments. At the same time, there is quite an extensive literature on arson generally, much of it from the United Kingdom and the United States and most of it focused on arson in urban structural environments. This literature does occasionally consider wildfires and other outdoor fires, but usually incidentally. There are

some very real and fundamental differences between arson in these different locations and environments and there are limits to how this broader literature can be applied to bushfire arson. These limits will be examined and discussed.

In trying to establish a basis for understanding bushfire arson, it is important to place this knowledge in context. Knowledge develops over time and contemporary understandings must find their roots somewhere. In this case, the roots of understanding for bushfire arson lie in the literature on arson in UK and US urban settings. This paper will begin by establishing some basic principles for building the understanding of arson before considering the literature on motivations and classification of arson that has developed in these settings.

The second part of the paper will focus on bushfires in Australia. It will consider some of the factors that differentiate arson in this setting from that in other settings and will examine how the broader body of knowledge can be applied to bushfire arson.

The third part of the paper will apply the knowledge gained in the preceding parts. It will consider the special case of arson committed by firefighters and will examine how knowledge about motives and classifications can be applied to managing and treating the offenders and preventing arson from occurring. This part will conclude by considering what future work is needed to build our understanding of bushfire arson.

Part 1: Fires generally

1 Understanding arson

What is arson?

This paper is about arson. Before entering into a discussion about arson, or any other topic, it is of course necessary to have some basic understanding or common ground to provide the foundation of the discussion. One useful starting point can be to establish some core definitions.

Arson is a term that comes into common use through ordinary language and the media. It may have different meanings for different people, but has some core elements. Most people familiar with the word arson will imbue it with notions that encompass a full range of wilful and malicious intentions and activities and will disregard the finer technicalities of meaning. As well as its various definitions, arson is a term that brings forth connotations for many people. Sometimes these connotations are highly evocative:

> …the tentacles of arson have transcended jurisdictional boundaries and pose a disastrous threat to the future safety and financial stability of the country [the US]. As a result the fire service, law enforcement, insurance industry, and various legislatures have mounted a combined offensive to deter its continuing devastation… [Arson] has destroyed or severely damaged practically every type of structure or mode of transportation in this country. It has also raped our forest and watershed lands and has been responsible for the death and injury of thousands of persons over the past years (Rider 1980a: 7).

A basic search for 'define: arson' using a popular internet search engine (www.google.com) revealed 13 definitions, including elements of:

- malicious burning to destroy property;
- intentionally setting of a fire to a building;
- the intentional setting afire of property;
- the intentional damaging or destruction or attempted damaging or destruction of property by means of fire or explosion;
- any wilful or malicious burning or attempt to burn, with or without intent to defraud, a dwelling house, public building, motor vehicle or aircraft, personal property of another, etc;
- the deliberate and intentional burning of property by its owner or by another person;
- the wilful and malicious burning or, or attempt to burn, any structure or other property, often with criminal or fraudulent intent;
- the wilful and malicious burning of property;

- the wilful, unlawful burning of property;
- the deliberate and intentional burning of property; and
- the deliberate setting of a fire.

While there is clearly some variation between these definitions they all have a number of core elements:

- the setting or starting of fire – fire is the fundamental element of arson and without the setting of fire arson does not exist;
- intention or wilfulness – all definitions of arson exclude fires that are started by natural causes or accidents;
- malice – most definitions of arson incorporate an element of malice, thereby excluding fires that are started intentionally but with positive or legitimate intent; and
- property – most definitions require that there be some kind of property or object which is burned.

As can be seen from the above general definitions, the element of intent is critical to a definition of arson. People deliberately light fires for a number of reasons and many of these are both legitimate and legal. A householder may light a fire in a home fireplace for warmth. A person may burn off backyard rubbish at a time and in a place approved by the relevant authorities. A land management agency and fire crew may set fire to bushland in a prescribed burn to reduce fuel loads ahead of a fire season (CSIRO 2002). Controlled fires are lit under conditions determined scientifically to be appropriate and with the involvement of firefighting crews who are prepared to extinguish or control the fire when necessary. In all these cases fires are deliberately lit but do not constitute arson as there is no intention to cause damage or harm and no breach of the law.

In any of these cases the fire may burn onto fuels surrounding the fire site or may spread out of hand causing property and environmental damage and even causing injury or loss of life. Assuming there was no negligence involved and the person or persons responsible for controlling the fire did all they reasonably could to keep the fire properly controlled, again there is no arson and no breach of the law because there was never an intention to cause damage or harm.

There is also a category of deliberate firesetting which is illegal but where the intention is not malicious, or at least is open to interpretation. Crowe (1999) argues that many fires lit by rural landholders may be lit illegally and may not always be lit under appropriate conditions or with measures taken to control the fire spread. Crowe notes that sometimes these fires are lit with no apparent regard for whether the fire will spread or not.

These types of fires are not usually seen by fire or police agencies as a significant problem and are only treated as a minor breach of legislation (Crowe 1999: 46). Nonetheless, Crowe contends that this type of burning may result from resentment towards the government, perhaps over a perceived indifference to the threats posed by bushfires or land management practices. To many rural firesetters, government land does not constitute property and the low level of response made by fire agencies and police may endorse this attitude. Crowe feels that the motives of these rural firesetters are not unlike those of arsonists, with the only difference being that the intent behind the ignition does not include causing harm to life or property.

In another circumstance though, a person may light a fire with the intention that the fire will spread and cause damage. The fire indeed serves its purpose and a family's home is destroyed. Responding fire crews and police investigate the fire but cannot identify the perpetrator who is never arrested or prosecuted. Perhaps a suspect is arrested and prosecuted, but acquitted because of a lack of evidence. Strictly speaking, arson has not occurred in these circumstances either, because there has been no legal determination as to the facts and elements of an offence. In another case, the fire may have been lit in such a way that investigators are never certain that ignition was deliberate. Indeed it is possible to come up with many scenarios where a fire has been deliberately lit with destructive intentions but an offence of arson has not arisen. Although, as discussed later, it is certainly possible to find evidence, identify suspects and secure convictions in arson cases, it is not an easy offence to investigate and clear-up rates are low.

When used in its broader sense, the term arson will include not only fires that are lit with the intent to damage and perhaps cause physical harm, but those lit with wilful disregard for the possibility that damage and physical harm may result. This will not include fires lit for entirely legitimate purposes, such as campfires lit in mild weather conditions which get out of hand because the person lighting them has been careless about clearing leaf litter from around the site. It will, however, include cases where a person lights a fire, knowing there is a reasonable likelihood that it will spread and cause damage, but does so anyway. It will also include cases where a person lights a fire with positive intent but with wilful disregard for the law, such as the landholder who sets fire to their own land to clear it for grazing, knowing they do not have approval to do so and knowing that they have not alerted local fire crews to be on hand in case the fire becomes uncontrollable.

In one strict sense, arson can be seen as a concept defined by legislation. Without a determination by a court that a fire was deliberately lit with an intention to achieve outcomes defined in the legislation, arson in the legal sense has not occurred. Legal proscriptions against the damaging of property by fire are critical to the existence of arson as a negative action in the common understanding. To discuss arson in strict legal terms though would be to narrow the subject of interest markedly. The NSW Fire Brigades service, like many other collectors of fire data, does not use the term 'arson' in its data collection:

> Arson is a crime, and from a strict legal standpoint, a fire cannot be categorised as arson unless a court accepts a standard of criminal proof; consequently the established incidence of arson is very low. Using a strict legal definition of arson will then give a precise result, but one which does not reflect the underlying pattern of arson activity (NSW Fire Brigades 1994).

If the goal is to arrive at an understanding of how often people deliberately light fires in illegal or illegitimate circumstances, what kinds of people are lighting these fires, why they do it, and what can be done about it, then it is necessary to broaden the discussion. Perhaps the most useful way of doing that, and certainly the way adopted in this paper, is to include the broader category of *incendiary* and *suspicious* fires. Drabsch (2003: 9) has defined incendiary and suspicious fires as those where:

> either the physical evidence or legal decision indicates that the fire was deliberately lit whereas suspicious fires are fires whose circumstances indicate the possibility that the fire may have been deliberately lit, given that multiple ignition factors were found or, in the alternative, no accidental or natural ignition factors could be found.

This has been expanded on by Hall (1998: 63) who refers to an incendiary fire as one where the physical evidence or a legal decision indicates it was deliberately lit by someone capable of understanding the act.

The NSW Fire Brigades' incident reporting system distinguishes between fires attributed to incendiary causes and those suspected of being suspicious in nature. The two causes are distinguished from each other only in the degree of proof or evidence accepted before a cause is entered in the more definite incendiary category (NSW Fire Brigades 1994). It is often difficult to readily determine the cause of a fire with certainty, for two main reasons. First, it is often a matter of conjecture as to what has caused a fire and, second, determination tends to depend on what resources are available to investigate and identify the underlying cause of the fire (NSW Fire Brigades 1994).

Alongside the terms arson and arsonists, the terms 'firesetting' and 'firesetters' are used throughout this paper. These have been chosen as terms used widely in the literature and ones considered to have a generally accepted meaning. When used in this paper, firesetting refers to any act of deliberately igniting a fire, while firesetter refers to any person deliberately igniting a fire. Unless clearly indicated otherwise, this is a fire ignited for malicious purposes in illegal circumstances.

Reference is also made throughout this paper to 'deliberately lit fires'. Unless otherwise clearly indicated, this term refers to fires that are deliberately lit with malicious intent or wilful negligence in illegitimate and illegal circumstances.

Bushfires and wildfires

As the core component of this paper is arson in relation to bushfires, it is useful to establish what is meant by the term 'bushfire' and the related term 'wildfire'. A valuable guide to these terms is provided by the Forestry and Forest Products division of the Australian Commonwealth Scientific and Industrial Research Organisation (CSIRO 2002):

> In some cases, fires may have been deliberately lit to achieve a set goal such as to remove hazardous fuel, encourage germination, or to clear off old growth pastures to encourage green pick. These fires are called 'prescribed' or 'controlled' fires as they are lit following a particular prescription to achieve a particular goal and their development is strictly controlled.
>
> Bushfires that are accidentally lit, lit by arson, or as a result of lightning strike, and burn unchecked, are called 'wildfires'.
>
> Bushfires are generally classified according to the dominant vegetation (called fuel) in which they are burning… In Australia there are two main vegetation types prone to fire. These are grasslands and forests. Therefore, a fire occurring in a grassy paddock is called a grass fire and a fire occurring in a forest is called a forest fire. Other significant vegetation types prone to fire include heath, scrub and buttongrass. A wildfire spreading across the landscape may burn in more than one type of vegetation simultaneously.

In this report the term 'bushfire' is primarily used when referring to fires that burn in outdoor areas of grassland, scrubland or forest. This term does not include 'prescribed' or 'controlled' fires as defined by the CSIRO above. The term 'bushfire' in this report includes fires that burn unchecked in pastures or on privately held farming land but, unless otherwise indicated, only in circumstances where they are allowed to burn unchecked or allowed to encroach upon grassland, scrubland or forest areas.

Throughout the report the terms 'bushfire' and 'wildfire' are used interchangeably and have the same meaning. Terms such as 'grass fire' or 'forest fire' are also used when referring specifically to fires occurring in these environments.

Aboriginal firesetting

Particular mention should be made of the setting of fires by Aboriginal Australians for land management purposes. Fire in the Australian bush is a natural occurrence and for many flora species fire is necessary or beneficial for regeneration. Aboriginal people arrived in Australia some 50,000 years ago and have long known of the benefits and uses of fire,

maintaining fire management regimes since long before European settlement (Tropical Savannas CRC 2004). Fire has been an important traditional tool for Aboriginal people, allowing the regeneration of food sources and the gathering of food animals. The significance of fire is indicated by the different names Aboriginal people have for different fires, reflecting the dozens of different reasons why they burned (Braithwaite 1991: 247). This has been particularly important in the Top End of the Northern Territory, where fire continues to burn two-thirds of the country each year (Braithwaite 1991: 247).

The arrival of European settlement disrupted Aboriginal fire management regimes. The effect of Aboriginal fire management on the environment and its changes since European settlement is a specialist field of research and well beyond the scope of this paper. Nonetheless, it is relevant that in some cases Aboriginal people in rural areas will continue to light fires for land management purposes, even where contemporary fire management regimes or agricultural practices have made this no longer necessary or desirable. The resulting fires can impact negatively on non-Aboriginal agricultural pursuits and may on occasions cause property or livestock losses.

While this type of firesetting by Aboriginal people is intentional and may cause damage, it is not malicious in nature. Those people setting the fires may do so out of a belief, based on traditional knowledge and practices, that setting the bush alight regularly is necessary or beneficial. They do not intend to destroy or damage property. The possibility that these fires may have negative impacts may be disregarded but not wilfully so. More likely it is simply not taken into account, as it is outside the realms of traditional understanding.

Aboriginal firesetting based on traditional approaches to land management, while intentional, is not malicious and is therefore not considered to be 'arson' for the purposes of this paper. This does not exclude from the working definition of arson those fires that are lit with malicious intent, whether in rural areas or urban interfaces, for purposes other than traditional land management and which happen to have been lit by Aboriginal people.

Is arson like other criminal acts?

The nature of the offence

In one sense arson can be viewed as a discrete act, involving the lighting of a fire with the intention to cause damage, and possibly also to deliberately endanger life. Within legislation, arson is indeed a discrete offence. In another sense, arson can be seen as a combination of a number of illegal actions combined into an activity.

Arson differs in a range of respects from many other offences. In some cases arson may be a crime of violence, yet the intended victim is not always apparent, or even necessarily

present. In other cases it may be a crime committed for financial gain, but the source of the profit or the means of attaining it are not always clear. There are also cases where the commission of the offence, and the damage that results from it, are ends in themselves.

Arson typically involves criminal damage to property. In many Australian jurisdictions the offence of arson is differentiated from the offence of criminal damage only through the use of fire or explosives, yet arson generally carries a much higher penalty than criminal damage (Model Criminal Code Officers Committee of the Standing Committee of Attorneys-General [MCCOC] 2001: 37). Arson has been called an aggravated form of criminal damage (MCCOC 2001: 47). The differentiation of arson from criminal damage may be attributable to the abhorrence with which arson is often regarded, and the inherently unpredictable means of destruction that fire creates (MCCOC 2001: 37).

As noted by Crowe (1999: 45), in most statutes any fire that is lit with the intent to destroy or damage property is regarded as arson. Crowe therefore concludes that the characteristics and motivation of an arsonist must be violent in nature:

> In Australia, any person who deliberately lights a fire in rural or forest areas during hot, dry, windy conditions must be considered to have had the intent to cause damage and destruction.

A closer examination of the elements of a 'bushfire arson' offence, and a summary of applicable legislation, is examined in the appendix to this report.

Is arson an easy offence to commit?

The published literature on arson often makes reference to it being one of the easiest crimes to commit without planning, as it requires no weapon and does not require face-to-face confrontation with a victim (see for example Ritchie & Huff 1999: 733). It is also suggested that one does not require a great amount of skill to ignite a basic fire (Drabsch 2003: 8). While this is true in one sense, it is perhaps equally true that lighting a fire is no easier or harder than stealing a car, punching someone, sticking a knife in them or ingesting an illicit drug. Violent offences such as assault or sexual assault can be, and often are, carried out impulsively with no weapon. Many forms of property crime, such as theft of a handbag or shoplifting can be carried out with no planning, tools or weapons. The weapons or tools required to carry out a broad range of other offences such as breaking and entering, vehicle theft or even murder are no more sophisticated and no harder to obtain than the matches and petrol that might be needed to get a fire going. Only a limited range of offences, involving fraud or large-scale theft, necessarily involve planning. Many types of theft or offences such as extortion or criminal damage can be perpetrated without ever coming into contact with a victim.

In some respects, arson may in fact be one of the harder offences to commit effectively. It cannot be carried out with only one's own body and requires the would-be offender to obtain at least rudimentary equipment and materials. Successfully igniting a fire in a building may require considerable planning to identify the best time of day in order to avoid detection by security guards and others. The offender may have to find a part of the building or materials in and around the building that will help the fire ignite and spread.

In the case of bushfires, successfully starting a large fire might require knowledge and planning, taking into account the right time of the day, vegetation type, wind speed and direction as well as the slope and aspect of the land. The bushfire arsonist may have to bide his or her time to find a day and time when weather conditions are suitable. While many bushfires may be started without this kind of planning and knowledge they are less likely to spread rapidly and become a danger to life and property than those that are planned. This is in contrast to other offences, in particular violent offences, where the level of planning and specific knowledge is often irrelevant to the severity of the offence.

The extent to which bushfire arsonists plan their offences and select the conditions most conducive to the ignition and spread of the fires they light has significant implications for investigation and prevention, and will be considered later in this report.

Why fire?

Fire holds a particular place in the collective psyche, stemming from the unusual combination of danger and benefit that it presents. Fire can provide warmth and reassurance; it can be comforting and romantic. It can be harnessed for our use (Shea 2002: 1). It can also be a terrifyingly powerful and unpredictable force capable of immense destruction to life and property. There are few forces more potentially destructive than fire and perhaps none that can be so easily created and released. To understand the fear that fire can invoke, one perhaps need look no further than Biblical depictions of hell and the torment it is said to bring.

The deliberate lighting of a fire can be an action with multiple elements and purposes. When these purposes are antisocial, many of them could be achieved by using means other than fire. There are other ways to generate excitement, exact revenge, cause wanton damage or gain attention which, as will be seen later, are some of the major motives behind deliberate firesetting. The decision to use fire in an expression of antisocial behaviour, rather than any other means, may be based on a number of factors, such as:

- the relative ease of lighting a fire;
- familiarity gained with fire during childhood;

- the accessibility of fire-lighting tools and materials; and
- fire's capacity to symbolise power and domination and to generate fear (see Drabsch 2003: 9).

Fire is unique in its ability to put power in the hands of an otherwise disempowered person. Vreeland and Levin (1990: 40–41) have suggested that firesetting may be a way for an individual lacking in self-confidence to express aggressive impulses without having to interact with or confront another person. Firesetting allows a display of aggression that is both distant and provides immediate rewards.

There are other ways of achieving these outcomes. A gun carries a certain power and is certainly a means of achieving a degree of certainty if a person's goal is violence. There have been cases where a single person with one or more firearms has taken multiple lives. A gun cannot cause the kind of widespread destruction that fire can. An otherwise powerless person with a cigarette lighter or a box of matches can achieve destruction, create excitement or attract attention on a huge scale. Fire can create terror and can express anger or enact revenge in a uniquely dramatic way. Only the force produced by explosives can match the potential of fire. Fire tends to be an element of an explosion in any case, and it is not surprising that most legal definitions of arson include damage caused by explosives.

While the use of fire may create unique elements in an offence, it may only be the outward expression of motivations common to a range of antisocial behaviours. Shea (2002: 1) has made the observation that the only thing that is really unique about firesetting and its causes, compared with other forms of antisocial behaviour, is that it involves fire. Ultimately, he contends, the factors that contribute to and explain firesetting are the same as those underlying all manifestations of antisocial behaviour. This is true in some cases. As will be discussed in more detail later, a young person may respond to an abusive family setting by acting out in various ways. At one time this may involve stealing a car for the excitement of a joy ride, while at other times setting a fire may be the means of generating excitement. A group of bored youths keen on some wanton destruction may start a fire in a bushland picnic area at one time and spray graffiti on a wall another time. The desire or need for money that motivates a bank robber may be no different in essence from the desires that lead to a person igniting a building and then claiming the insurance.

While there may be nothing unique about the factors contributing to firesetting, the decision to respond to these factors through the setting of fire rather than any other means is significant. The spraying of graffiti certainly causes a degree of damage, which can generally be repaired with relatively little cost. There is no possibility though that the graffiti or the robbery can cause utter destruction of a building or take the lives of those inside it. The vandals who light a fire intending that it cause no more damage than some spray paint

would may lose control of the fire with devastating results. At the same time, if a person is seeking to destroy one or even many buildings and endanger or kill a large number of people, there are few more effective or readily available ways of doing this than by lighting a fire. The decision to use fire therefore manifests a response to underlying stimuli that is both more dramatic and in some ways more extreme than most of the other possible responses.

Is the rate of arson increasing?

There are many sources in the literature asserting large increases in the incidence of arson in recent years. In the UK, recorded levels of arson have increased dramatically in recent decades. While arson accounted for only half of one per cent of all fires in 1950, this had increased to more than 25 per cent of fires in 1993 (Kidd 1997: 27).

Locally, one media report claims that in the past 30 years Australia's population has increased by 50 per cent but recorded arson has increased by almost 2000 per cent (SMH 2002a). Official figures show a trend of steadily increasing rates of arson. The number of recorded criminal incidents for arson in NSW in 2001 was 7,310, compared with 6,157 in 2000 and 4,692 in 1998 (Drabsch 2003: 9). This increase was not just an isolated effect over these years, and the rate of arson has doubled every eight years since 1964 (Drabsch 2003: 9).

Statistical reports by the NSW Fire Brigades (NSWFB 1994, 2003) show that between 1987 and 1993 the number of incendiary and suspicious fires overall increased by 219 per cent. The number of incendiary and suspicious fires as a proportion of all fires rose from 13 per cent in 1987 to 34 per cent in 1993 and had risen to 38 per cent by 1998–99 (NSWFB 1994: 1, 2003: 125).

The largest number of these types of fires was in residential structures, but only a small percentage of all residential fires were considered incendiary or suspicious (NSWFB 1994: 1). In contrast, the total number of fires in educational institutions was small but nearly half of them were considered incendiary or suspicious.

Interestingly, the NSW Fire Brigades called incendiary and suspicious fires an 'urban phenomenon' and found a clear link between a high frequency of incendiary and suspicious fires and greater population size (NSWFB 1994: 1). This relationship held true for bushfires as well as urban structure fires, with the greatest numbers of bushfires occurring in the outer Sydney urban–bush interface and around population centres at Lake Macquarie to the north of Sydney (NSWFB 1994: 16–17).

A compilation of statistics collected by the Australian Fire Authorities Council (AFAC) and the CSIRO Division of Building, Construction and Engineering for 1992–93 showed that

incendiary or suspicious fires accounted for 55 per cent of all fires (King 1995). This was attributed to a quadrupling of suspicious bush and grass fires in the four-year period since national data had been collected (King 1995: 24–25). The rate of suspicious fires per 100,000 fires, for those in bush and grass, increased from just over 50 in 1989–90 to 220 in 1992–93. King acknowledged however that the apparent increase may be due to a change of attitude by firefighters as to whether they reported the fire as suspicious or arson (incendiary) and that this may have been due to increased knowledge about the role of the newly collected statistics (King 1995: 25). A brief examination suggested the fires were generally of nuisance value or only small financial value, suggesting there was no basis for financial gain as a motive (King 1995: 25). The NSW Fire Brigades have also noted a rise in incendiary and suspicious fires as a proportion of all fires they attend, from 17 per cent in 1989–90 to 38 per cent in 1998–99 (NSWFB 2003: 124).

While the data show large increases in the rates and proportions of incendiary and suspicious fires, this does not necessarily mean there has been a corresponding increase in the actual number of fires being deliberately lit. Hall (1998) has suggested that the notion of arson as one of the fastest growing crimes is a myth, at least in the US, due to the reliance by media sources on insurance industry estimates of the problem. He contends that while arson may be increasing in some communities, law enforcement and fire authority data show a long-term decreasing trend. Hall notes that arson fires outdoors add considerably to the total number of arson incidents, without adding greatly to losses of lives or property (1998: 60). While outdoor fires constitute a large proportion of all incendiary and suspicious fires, they are only a very small proportion of prosecuted arson offences, which Hall attributes to the lack of monetary damage they typically cause, which reduces the likelihood they will be reported to law enforcement agencies.

The NSW Fire Brigades have attributed the rise in incendiary fires seen in that state to an increase in the accuracy of data recording and a consequence of substantial resources put into improving investigation skills and training firefighters to recognise the causes of fires (NSWFB 2003: 124). The Brigades also note that the assessment of cause is usually in the opinion of the reporting officer and firm determinations are only made in a minority of cases (NSWFB 2003: 124, 135).

Similarly, in response to figures showing a 20 per cent increase in arson fires across Victoria, the Metropolitan Fire Brigade stated this increase was largely due to previously ignored fires now being reported, and firefighters and police being both more aware and more suspicious of the causes of fire (ABC 2003).

The NSW Fire Brigades noted that the increase in incendiary and suspicious fires it recorded corresponded very closely to a decrease in the number of fires whose cause was unknown, undetermined and the number attributable to children (NSWFB 2003: 8). This is largely due to a change in the way fires caused by children are defined. Prior to

July 1993, the NSW Fire Brigades included in the 'caused by children' category any fire whose cause could be traced back to the activities of children. The data definitions were then changed, so that if the intent behind the ignition is considered malicious, regardless of the firesetter's age, the fire is recorded as incendiary and suspicious. The number of undetermined tree, bush and grass fires dropped from 23 per cent to 15 per cent of all fires during the period (NSWFB 2003: 8), largely due to training which improved the ability of reporting officers to determine the cause of the fire. Vegetation fires nonetheless have remained the predominant type of fire attended by the NSWFB, constituting 39 per cent of total fires in 1989–90 and 26 per cent in 1998–99, the change attributed to wet summers in the latter period (NSWFB 2003: 133).

What impacts do fires have?

The United States has one of the highest fire death rates in the industrialised world at 12 deaths per million population (USFA 2002). In 2002 there were 3,380 civilian deaths and 18,425 civilian injuries due to fire, while 100 US firefighters were killed in duty-related incidents. In 2002, just under 1.7 million fires were reported in the US but many others went unreported, causing additional injuries and property loss. Direct property loss due to fires was estimated at $10.3 billion. The contribution of arson is shown by the finding that in 2002 an estimated 44,500 intentionally set structure fires resulted in 350 civilian deaths and an estimated $919 million in property damage (USFA 2002).

It is estimated that arson costs insurers in the UK £1 million per day, for a total insured damage of £350 million per year, while uninsured losses could increase this to over £500 million annually (Lewis 1999: 17). It is common, though, for a small number of serious fires to distort the statistics. A 1996 study in the UK found that 20 per cent of the annual loss due to arson was the result of only 189 individual arson attacks (Lewis 1999: 17).

There is a lack of consolidated fire incident data available in Australia, though some estimates are available. The cost of fire damage to the Australian community has been estimated to be $600 million per year, though some regard this as a conservative estimate (Cafe & Stern 1989 : 1). Arson is considered to account for approximately 30 per cent of this figure, an amount of some $180 million per year (Cafe & Stern 1989 : 1). Earlier estimates put the total cost of fraudulent arson at $48 million (Sheehan 1998: 5). Non-fraudulent arson, where the fire was not lit with the primary aim of securing an insurance claim but nonetheless led to a claim being made, was estimated to cost insurers nearly $30 million (Sheehan 1998: 5).

The NSW Fire Brigades have reported that the direct property damage caused by incendiary and suspicious fires between 1987 and 1993 amounted to some $400 million, more than that caused by accidental fires despite the total number of accidental fires being much larger (NSWFB 1994: 1). Over a 10-year period, the number of fires responded to by the

NSW Fire Brigades increased by 13 per cent. In 2001–02, the Brigades responded to a total of 38,851 fires (NSWFB 2003).

Clearly arson is not responsible for all fires; a certain proportion of fires start accidentally and bring about the loss of life and property. Deliberately lit fires tend to be much more costly overall than accidental fires for a number of reasons (Lewis 1999: 17):

- There are often multiple seats, or starting points, of fire. An arsonist may create several seats of fire to ensure that the fire catches on and is sufficiently serious to have the intended effect. Some arsonists may also believe that creating a more serious fire will eliminate physical evidence.
- Ignition and spread of the fire may be assisted with flammable liquids. The use of petrol and other accelerants may create an explosive effect that can cause considerable damage even if the blaze is quickly extinguished.
- The fire may be lit at vulnerable points in a building, such as places where it is calculated to spread quickly or in areas where particularly flammable substances are held. In contrast, an accidental fire is more likely, on the basis of chance, to start in a part of the building that is not particularly conducive to rapid spread of the fire.
- Arson-induced fires are typically lit at night and may burn for some time before detected. UK research shows urban arson is more likely to occur in winter when there is relatively little outside activity and movement of people, than in summer.

The total economic costs of fire due to arson include unemployment, tax losses, fire-fighting costs, insurance system costs, court costs and health care costs:

> The social and health effects of incendiary fires are best estimated in terms of human disruption and misery. (Vreeland & Levin 1990: 31)

More information about the incidence of deliberate firesetting in bushland environments and its impacts, is considered in Part 2 of this paper.

Investigation and prosecution of arson

It is often said that arson is a particularly difficult offence to investigate and prosecute as the fire itself tends to destroy much of the evidence. The investigation and prosecution of arson are specialist activities and it is not proposed to examine them in detail in this paper. Detailed work on these topics will be undertaken in the future. Nonetheless, a brief examination of issues surrounding investigation and prosecution is an important background to understanding broader aspects of arson.

Arson may in the first place be a difficult offence to even detect, let alone investigate. The nature of arson and fire behaviour is that it may not always be obvious that a crime has actually been committed (Drabsch 2003: 8). With most offences, there will be a victim or perhaps a stolen item, and it will generally be apparent that the actions of another individual or individuals have brought the situation about. When a fire occurs, however, it may take some time before a suspicion that the fire is deliberate can be supported by evidence, or even before the suspicion arises that the event was not accidental or natural.

Once this suspicion has been formed, there are various ways of investigating whether the fire was intentional or not. Fire investigation is not necessarily an easy task and may require extensive resources. Nonetheless, it has been said that every fire not investigated is a lost opportunity to develop a better understanding of the psyche of firelighters and the triggers that cause them to light fires (Crowe 1999: 47). Further, Munday (2000: 30) has argued that the failure to investigate all fires in detail gives a clear signal to arsonists to carry on with their activities, as does the failure to prosecute and secure convictions when the evidence is strong. He notes that while fire may destroy some evidence, it also creates other evidence which can be detected and interpreted by trained investigators.

The basic role of a fire investigator is twofold:

- to determine where the fire began; and
- to examine the site to determine what caused the fire to start there (Cafe & Stern 1989).

The full investigation of a fire may require a team including specially trained police, fire service officers, forensic scientists, chemists and engineers (Cafe & Stern 1989). Fire leaves behind physical evidence in various forms and a range of scientific equipment, techniques and methods have been developed for examining the ways a fire spreads and the material it leaves behind. Together with scientific evidence of the fire itself, investigators can apply evidence from witnesses, other physical evidence (such as the means of entry to a building) and circumstantial evidence (such as a the financial records of a destroyed business). In the case of a bushfire, there may not always be much physical evidence left behind, and investigators may be more reliant on circumstantial and behavioural evidence.

Clear-up rates

The difficulty of detecting, investigating and prosecuting is perhaps best indicated by reference to the number of arson cases that are ‘cleared’ – that is, resolved by charging and perhaps successfully prosecuting an alleged offender. The number of cases that are cleared results in a ‘clear-up rate’.

In 1996 in the United States, arson arrests were just 0.12 per cent of all arrests and just 0.67 per cent of FBI index crime arrests (Hall 1998: 65). From 1980 to 1996, the clearance rate for arson was between 15 and 19 per cent each year. This is similar to the rate for other property crimes such as burglary (Hall 1998: 65). On average, FBI clear-up rates for arson are 18 per cent (Ritchie & Huff 1999: 733).

In 1982, Koson and Dvoskin (cited in Doley 2003b) found that in a sample of 26 arsonists, 38 per cent had a prior history of firesetting. These offenders had lit 46 fires between them yet had only had a total of eight prior arrests and convictions. It is apparent that, at least within this limited sample, arson offenders may get away with far more offences than they are apprehended for.

Western Australia Police Service clearance rates for arson are reported to be the highest in Australia at 30 per cent, though it is noted that this still means most cases go unsolved (WA Arson Task Force 1999: 1). In NSW, the clear-up rate for arson in 1989 was only 7.5 per cent (Drabsch 2003: 11).

The difficulty of prosecuting arson cases is highlighted by a study of 178 US federal cases from 1980 to 1989 in which arson was the most serious offence (see Hall 1998: 66). Of these cases, the government prosecuted 43 per cent in the district court, referred seven per cent to US magistrates and declined to prosecute 50 per cent. Given that only a small proportion of arson cases are likely to proceed to charging and referral for prosecution, this further diminution indicates the very small proportion of arson cases that ultimately proceed to trial. Nonetheless, another study of 160 arson cases prosecuted in the US district court during the same period found that 66 per cent of the cases resulted in conviction with 34 per cent dismissed or acquitted (Hall 1998: 66). This suggests that where the evidence is strong enough there is a reasonable likelihood of conviction, but only a small number of cases ever proceed to that stage.

This point is further illuminated by the observation that of all the fires reported to fire authorities, about one-third are confirmed as incendiary (Hall 1998: 66). Eighty to 85 per cent of these are never solved or cleared by arrest. Around half of those arrested are not prosecuted and around one-third of those prosecuted are not convicted. Therefore, the percentage of fires for which someone is convicted is around two per cent (Hall 1998).

It can be difficult to closely relate the rate of arson arrest, and the number of arsonists arrested, to the number of fires they cause. In some cases serial arsonists may set large numbers of fires, such as a US case where one individual was known to be responsible for 600 fires (Verrengia 2003). In many cases, though, an individual may be arrested but only charged with lighting one fire (the fire for which there is sufficient evidence). The conviction of one individual may clear many cases, without this ever being reflected in the statistics (Verrengia 2003).

Doley has noted (2003b) that determining the incidence of arson may be made more difficult by the fact that arsonists may ultimately be convicted of something other than arson. Given the evidentiary issues that arise in arson cases, and the use of plea bargaining in the US, many people investigated for lighting fires may eventually be convicted of a more readily provable offence, such as breaking and entering.

It is also pertinent to consider to what extent convicted arsonists reoffend. Doley (2003c: 2) has stated that 'most arsonists are serial offenders, regardless of whether they have a recorded arson conviction or not, and that there is a hard core within that group who will not desist from firesetting.' She notes that estimates of arson recidivism range from four per cent to 46 per cent, but that around 30 per cent of arsonists have more than one conviction for firesetting (Doley 2003c: 5). However, recidivism rates for arson in the US are said to be much lower than for other offences, particularly property crimes (Hall 1998: 66).

2 Why people light fires: motives, classifications and profiles

Understanding why people commit antisocial acts and carry out criminal offences is important for a range of reasons. Police and other agencies can apply this understanding to target and direct investigations and take preventive measures. Governments can apply an understanding of motives and criminogenic risk factors to the development of programs in areas such as crime prevention and community services. Correctional agencies and those in the welfare and counselling professions can use this understanding to apply interventions. Courts like to identify causative factors and understand what has led someone to a particular act, as this can inform the determination of an appropriate sentence, or in fact whether a sentence is appropriate at all (Shea 2002: 1). Identifying causative factors is a fundamental first step in deciding whether a clinical or treatment-based approach to management of the offender is an option (Shea 2002).

There has been a considerable body of literature generated from attempts to understand the characteristics of arson perpetrators. Lewis and Yarnell (1951: 8) note that there were at least 130 articles on the psychopathology of firesetting published prior to 1890.

Much of the literature on arson has developed in the UK and US, and has focused on arson in urban settings. The emphasis of this work has typically been on structural fires, whether residences, business premises or institutions such as schools.

As will be discussed later in this report, there are some significant areas of difference between arson in urban settings and in bushland settings, and these differences may fundamentally influence attempts at categorising bushfire arsonists and their motivations. At the same time, an examination of the literature on general and non-bushfire arson serves to provide a necessary basis on which the more specific literature on bushfires can be examined. Put another way, to understand what bushfire arson is, it is useful to understand first what it is not.

Approaches to organising knowledge about arson

Within the published literature on arson, writers have adopted a number of different approaches to the level of examination they undertake, and the way they organise and present their information. The principal forms of examination and organisation are at the level of motives, classifications and typologies, and profiles.

Motives

Some writers have sought to identify and examine different motives – reasons for undertaking an action or the factors that push a person towards a particular action – for committing arson. These have usually included a consideration of how frequently each of these motives appears in offences as recorded or reported by a research sample.

Classifications and typologies

Some studies have developed schemes of classification and typology based on motives for committing arson, personal and other characteristics of arsonists, or some combination of these. One common observation in the literature is that arsonists are not a homogenous group and all arsonists do not share a common set of characteristics nor do they light fires under the influence of a single motive. This has led to a literature dominated by the development of schemes of classification and typologies that have attempted to categorise arson perpetrators on the basis of the types of fires they have lit, their actions and behaviours surrounding the offence or their motives for carrying out the offence.

These classifications and typologies provide a solid basis for developing an understanding of those who commit arson offences, though they are not without some significant limitations, as will be discussed in detail at the end of this chapter. In particular, many classification schemes and typologies intermix and sometimes confuse motives and offender characteristics. Early classification schemes tended to be somewhat arbitrary, with categories based on one overriding characteristic of the group (such as whether they were children or adults) or on the basis of interpreted motive (Doley 2003a). More recent studies have tried to combine both characteristics of the sample and motive, though may have produced significant overlaps in the process.

Profiles

Profiling is a technique for understanding criminal behaviour and informing investigations. It is a method of identifying the perpetrator of a crime through an analysis of the nature of an offence and the manner of its commission. Various writers, investigators and agencies have adopted different variations on the approach, which may be known as offender profiling, psychological profiling or criminal profiling. All approaches involve taking into account aspects of the offender's personality which are determined by his or her actions before, during and after the crime.

Combined with crime scene evidence and other details of the investigation, profiling aims to develop a description of the offender which investigators can use to narrow the field of suspects and the scope of the investigation. Only certain types of offences are suitable for profiling, as there must be discernible psychological factors underlying the offending and a discrete crime scene capable of producing evidence of the personality profile of the offender.

Rider notes that psychological profiling can be a legitimate and practical tool, but requires an element of psychopathology to be present in the crime (Rider 1980b: 7). The detectable elements of the crime must be able to produce distinct psychological and behavioural characteristics which can be used to focus the investigation.

In considering all elements of the offender and the offence, profiling has addressed many of the criticisms made by Vreeland and Waller (1979, cited in Doley 2003b) following their review of the literature on arson. Vreeland and Waller suggested that rather than trying to develop arbitrary classification systems based on motives, it would be more productive to consider the full range of factors involved in determining firesetting behaviour, including antecendent conditions (individuals' physical and social environments), organismic variables (personal variables such as age, gender, intellectual ability, psychiatric or psychological problems), the actual firesetting behaviour and the consequences of the act.

The current chapter examines the literature on arson in terms of motives, classification schemes or typologies and the development of criminal profiles. While each of these methods of examination are discrete in many respects, they also have common elements. All classification schemes incorporate motives, and indeed many are really no more than a way of organising a list of motives. Profiling incorporates motives and classifications in developing an understanding of arson offenders. Much of the literature mixes different levels of examination.

Rather than trying to separate out the different elements and levels of examination, the relevant literature is presented in chronological order. As will be seen, approaches to understanding arson have changed over time and a chronological approach is presented as the best way to reflect the growth and state of knowledge in this area.

Lewis and Yarnell 1951

Perhaps the first prominent attempt to understand the behaviours and motives of arsonists was in the work of Lewis and Yarnell published in 1951. In one of the largest studies of arson ever conducted, these researchers examined approximately 2,000 case files from the US National Board of Fire Underwriters, representing detailed accounts of incendiary fires submitted by the board's investigators throughout the United States. Lewis and Yarnell eliminated cases where the data were inadequate or did not yield clues to guide them in tracing the perpetrator. They also found, for reasons not explained, 'there were certain types which it was useless to follow' (p 29). These included:

- fires set by village 'hoodlums' in the course of 'other asocial depredations';
- most of the fires which had been traced to young men, as a group, setting fires for excitement; and
- fires set to conceal theft or burglary.

While it is possible that analysis of these categories of fires could have had been of interest to the present paper, it is hard to know how useful they might have been as the

numbers of fires fitting each category was not recorded. Lewis and Yarnell did include a small number of representative cases in each of the categories to provide a fuller overall picture of arson activities.

After eliminating the cases described, the authors included in their study 1,145 cases involving males 16 years of age or older, together with 238 additional cases of juveniles. They also found records of 201 cases involving adult female firesetters. Of the total number of firesetters included, personal interviews were conducted with 100.

Lewis and Yarnell acknowledged that the sampling methods underlying their study would produce some skewed results due to differences in local conditions, including differences in reporting rates influenced by the efficiency of local investigating authorities. Individual authorities were seen to exhibit biases in the categories of arson perpetrators they concentrated on, and there was variation across local areas and regions in the availability of psychiatric records. Against this 'ill-assorted group of cases', Lewis and Yarnell maintained that their sample 'afforded a fair overall picture of the problems of firesetting as reported from various sections of the country' (p 30).

In analysing the 1,145 cases involving adult males, Lewis and Yarnell found what they called 'natural subdivisions' (p 31). They classified their subjects accordingly, into the following groupings:

- 'psychotic persons' who made fires in response to delusional conceptions (154 men);
- those who made fires as an act of vengeance on a certain person or social order they thought had wronged them; the 266 men in this category included:
  - 174 who were angry at their employers, at institutions or at persons they believed were casting slurs on their character; and
  - 92 who acted out 'at the height of jealous resentment in injured vanity when the women of their choice seemed to be directing their affections towards others' (p 32);
- those who apparently made fires to conceal the commission of a burglary, but who are not discussed elsewhere in the text (n=38); and
- the remaining offenders (688 in total), who all tended to make a series of fires on properties to which they had no apparent emotional connection but who were interested in the resulting conflagration itself and the activities of firefighters.

Those in the 'remaining offenders' group were seen as approaching the classification of a 'pyromaniac' who is motivated by irresistible impulse. Included in this group were:

- tramps or migrant workers who sought to make destructive fires large enough to dispel feelings of depression and oppression and as a reaction against society (n=74);
- would-be heroes who set fires and then 'discovered' and reported them in an effort to be seen as alert and community-minded and praised as heroes (n=69);
- volunteer firemen, those who wanted to be firemen, or fire 'buffs' who frequented fire stations out of their interest in fire; these men would start the fires, sometimes raise the alarm, and then go to the scene attempting to assist with fire operations (n=98); and
- individuals who lit fires for no apparent reason other than in response to an 'irresistible impulse' (n=447).

In discussing the incidence of firesetting amongst firefighters, Lewis and Yarnell contended that the need for recognition and attention, and the lighting of fires as a way of stimulating excitement and being involved does not tend to arise in paid firefighters. These professionals may view fires as exciting and stimulating, but ultimately just a job to be done (p 193). The authors saw this motivation as arising much more in the case of volunteer firefighters from small towns, where the local community has a keen interest in the work of their firefighters and the volunteers can gain prestige through their role (pp 193–194). Interestingly, Lewis and Yarnell found that in their sample most cases of firesetting by volunteers occurred in groups of two to 15 men.

Lewis and Yarnell drew comparisons yet separately categorised the volunteer firefighters they found to have engaged in incendiary activities and what they called the 'would-be hero' firesetters. The authors painted a rather unflattering picture of this group (p 228):

> These are the firesetters motivated primarily by vanity – the little men with grandiose social ambitions whose natural equipment dooms them to insignificance. No activity is too bizarre, if it but brings them attention, for they are like adolescents who dream of becoming courageous supermen. They are exhibitionists, pathological liars... They are impulsive and unmoral, capable of assult [sic], rape, and thefts and their immaturity is revealed through their alcoholism, promiscuity and juvenile hankering for playing heroic games.

Children and pre-adolescent firesetters were considered as a separate group. Consistent with the overall structure of the present paper, other than to note children as a separate classification or group within Lewis and Yarnell's scheme, their findings on children will be discussed in the following chapter.

Gold 1962

Another early work which sought to develop a profile of firesetters based on psychodynamic principles was that of Gold in 1962. The assumptions on which Gold's work was based, which were perhaps typical of those underlying much of the early work in this field, are set out quite clearly in his opening two paragraphs in which he says, *inter alia*, that:

> It is generally accepted that a person who sets a fire intentionally is committing an abnormal act. His reasoning at this time is perverse, distorted; his behavior is selectively injurious… In the ranks of such disturbed people may be found mental defectives, neurotic and psychotic personalities, psychopaths of various grades and all kinds of criminal types.
>
> [Firesetters] can be shrewd and cunning… Often they will release their peculiar impulses in swift and undetected fashion achieving thereby some kind of symbolic realisation and strange gratification. (p 404)

Gold saw firesetting as perverse and aberrant behaviour whose origins were determined by sexual disturbance and urinary malfunction (p 416). Firesetting was characterised by aggressive and destructive impulses as a reaction to 'twisted and bizarre' psychological conflicts (p 416). He saw the setting of fire as a symbolic ritual with 'magical implications' and suggested that repetitive firesetting might indicate an obsessive-compulsive neurosis, suggesting that to some degree or another all arson offenders manifest schizophrenic thinking (pp 412–413). Gold felt that many people would experience the sexual disturbances that underlie firesetting and could not be certain why this did not lead to firesetting in a far higher proportion of people. He speculated that perhaps firesetters experienced an unusual release of energy potential along specific neural circuits which had been conditioned and imprinted earlier in life by abnormal experiences, both general and sexual (pp 407–8).

Inciardi 1970

Based on a sample of 138 sentenced arson offenders who had been released on parole from New York state prisons between 1961 and 1966, Inciardi (1970) grouped arson offenders into six categories:

- revenge firesetters;
- excitement firesetters;
- institutionalised firesetters;
- insurance claim firesetters;

- vandalism firesetters; and
- those who committed arson to cover up another crime.

Inciardi found that revenge firesetters were the most common in his sample, representing 58 per cent of cases (p 146). Revenge firesetters had a median age of 28 years, making them a relatively older group than others such as the vandals, who had a median age of 18 (pp 148, 151). Revenge firesetters were generally of below average intelligence and tended to grow up in low socioeconomic areas with poor parental supervision and often disinterested fathers. Revenge firesetters tended to use alcohol at the time of committing their offences and used simple materials, like matches and gasoline, to start the fires.

Excitement firesetters constituted 18 per cent of Inciardi's sample (p 149). They had a median age of 23 and were of average intelligence. They also came from financially poor environments and often had drinking problems. This group included a small number of volunteer firefighters.

The institutionalised firesetters comprised a small group of eight individuals in mental health institutions (pp 150–151). They had a median intelligence quotient of 70, placing them in the 'defective range'. They all had grievances against their institution and lit fires, typically escaping and igniting nearby farm buildings, so they could be transferred to another institution. Most of the firesetters in this group had been institutionalised since birth.

In contrast, insurance claim firesetters had higher than average intelligence and a relatively high median age of 29 (p 150). They generally came from middle-class backgrounds and did not exhibit drinking problems or juvenile offending.

Table 1: Summary of findings from a study of sentenced arson offenders

Category	Proportion (%)	Age	Socio-economic	Intellectual	Features
Revenge	58	28	Low	Below average	Poor parenting; alcohol
Excitement	18	23	Poor	Average	Alcohol
Institutional	6	19	Institutional	Defective	Grievance
Insurance	7	29	Middle class	Above average	No marital ties
Vandalism	4	18	Slum dwellers	Dull–normal	Juvenile gangs; only group not to work alone
Conceal crime	7	22	Lower middle	Above average	Single or separated

Source: Inciardi 1970

The vandals in Inciardi's sample were generally young and of limited intelligence, with relatively deprived backgrounds and separated families (p 151). They generally had no work record, or one involving unskilled labour, and typically were involved with juvenile gangs. Inciardi's findings are summarised in Table 1.

Scott 1974

In his 1974 work on the psychology of fire, Scott perceived all firesetters as falling into two broad categories of motivated and motiveless firesetters, though his conclusions were not based on an empirical study and he did not clearly indicate how his delineations came about. Those he saw as motivated were those whose incendiarism was purposeful in nature and perpetrated for some clear and rational objective in order to produce a tangible benefit or outcome. Within the motivated group Scott placed those whose firesetting was:

- profit-motivated;
- political fire-raising; or
- suicide by self-immolation.

Within the first group, Scott saw the motives for firesetting as 'quite open' (p 39). The profit-motivated firesetters burned properties to conceal other crimes or for financial reward. Scott's analysis of this group of firesetters was represented almost solely by his detailed account of the activities of the Leopold Harris gang. This was a group of individuals who, drawing on a certain Mr Harris' knowledge and experience as a fire assessor, committed a series of arson offences on business premises in England during the late 1920s and early 1930s, profiting from the resulting excessive insurance claims.

Scott similarly drew on historical accounts of the 'gunpowder plot' of Guy Fawkes at the beginning of the 17th century and the incineration of the German Reichstag in 1933 as his primary explanation of the activities of political firesetters (pp 55–60). He went on to describe the use of fire as a weapon of war, as a tool used by the desperate and oppressed in overcrowded American suburbs and the use of fire by paramilitary groups in Northern Ireland (pp 56–66). Scott used the same historical example technique in describing cases of people who, for religious or political reasons, chose to commit suicide through the use of fire.

Alongside the motivated firesetters, Scott contrasted the 'motiveless' firesetters, among whom he identified five groups:

- incendiarists – those suffering from a mental disturbance;
- children – focusing on those with issues of mental disturbance;

- ‘fire bugs’ – those who light fires for sensual satisfaction, including some firefighters and vagrants;
- psychotic firesetters; and
- ‘fire lovers’ or sexual fetishists.

Within his chapter on incendiarists, Scott presented a loose examination of those who light fires with no apparent motive, or motives that he deemed would appear pointless to most people. He noted that firesetting is much more prevalent among males and that there is a peak of incidence in the late teens and early twenties (p 80). Scott observed that most firesetters exhibit intelligence at the lower end of the statistically normal range, but there is also a well defined group of ‘mentally subnormal’ firesetters (p 80). He did go on to say that most of the incendiarists cannot be considered mentally deranged as they do not exhibit a characteristic mental disorder beyond their abnormal attitude to fire (pp 80–81).

Within the incendiarists category, Scott included some whom he considered to be acting without motivation, but to which other authors have ascribed clear motivations. These included those who commit fires as an act of revenge towards an employer or lover, or those who target the property of a business rival or an institution (pp 80–81). Scott also included among the motiveless those who start fires hoping to become heroes or for the thrill and excitement of the blaze and the response to it (pp 82–83).

Scott perceived ‘fire bugs’ as being driven by the sexual satisfaction they gained from fires and which they could not achieve otherwise. He drew on evidence of the marital difficulties experienced by regular firesetters to support this (p 96). A poor adjustment to life in general was a feature of the fire bug, whose life was characterised by employment and relationship instability and high levels of alcohol consumption.

Within his group of fire bugs Scott included firefighters, particularly volunteer firefighters who may start fires for excitement and sexual satisfaction as well as the possibility of being seen as a hero (p 97). The fire bug group also included vagrants, characterised by poor adjustment to life and an institutional upbringing who can only achieve gratification in life through the destructive power of firesetting (pp 100–101).

Through the category of ‘psychotic fire setters’, Scott considered those suffering from serious mental disturbances, such as schizophrenia, manic-depressive (bipolar) disorder and psychotic behaviour resulting from alcoholism (pp 120–121). He distinguished from this group those suffering from psychopathic (sociopathic) personality disorders, who he had included with the fire bugs.

Scott's final analysis was of the group he called 'fire lovers'. These are people, solitary and withdrawn from society, who experience a compulsive and fetishistic attraction to fire. Fire lovers, Scott claimed – apparently drawing his conclusions from Lewis and Yarnell – tend to be poorly endowed physically, may have physical deformities and are usually of limited intellect (p 130). They tend to come from severely disrupted or dysfunctional family backgrounds (p 131) and have difficulty controlling explosive and violent impulses (p 133).

Dennett 1980

Dennett (1980) has suggested that, from the point of view of a fire investigator, there are six broad categories into which all reasons, motives and methods of firesetters can be placed:

1. to gain financially;
2. to conceal another crime;
3. to destroy/protest;
4. to become a hero;
5. to fulfil a need (derived from a mental disorder); or
6. to relieve boredom.

In relation to the category of 'hero', Dennett made the observation that this motivation arises most often when the community or environment related to the would-be hero is of 'limited scope, quiet and uninteresting' (p 23). The 'hero' feels the need to prove himself to an object of affection, a boss or the community overall, and may decide to create the circumstances for a demonstration of his heroic qualities where these do not arise naturally. Dennett noted that where the 'hero' is able to successfully gain the kind of attention he seeks, this is likely to motivate him to light more fires to repeat the experience. He is then likely to continue lighting fires until his actions are detected by the authorities or the effects of a fire that got out of hand, particularly a fatal one, results in him deciding to stop.

Interestingly, Dennett observed that the idea of using fire as a means of gaining prestige and recognition might first come about when the 'hero' observes the outcomes of a fire that occurred under 'normal' circumstances (p 23). Seeing one or more people who discovered or helped extinguish the blaze receive bravery awards, publicity or praise may plant the notion of securing the same outcomes through the deliberate ignition of a fire. While Dennett's observation is not based on empirical research, it is derived from his experience as a fire investigator and carries interesting implications for the role of the media in contributing to bushfire arson.

Dennett's depiction of the hero also included some interesting insights into how offences involving the hero motive may be detected. Signs that may indicate the presence of a hero-motivated arsonist include (p 23):

1. several small fires lit in an area which are discovered before they have a chance to develop;
2. unusual attitudes or behaviour in the person discovering the fire – this might include 'discovering' the fire when he or she had no clear reason for being in the area at that time, or being fully dressed in the middle of the night when a fire breaks out (including being ready in uniform in the case of volunteer firefighters); and
3. the same person being present at each of a series of small fires.

Rider 1980

Rider's work (1980a, 1980b, 1980c) is primarily oriented to the development of psychological profiles of arson offenders. As an introductory point he notes that arson for financial gain is rarely considered in any detail in the literature, perhaps because it is considered a rational act and therefore not of great psychological interest (1980a: 11). He also notes that revenge seems to run like a thread through all accounts of motivated arson (Rider 1980a: 13). Interestingly, in many of the analyses that have come after Rider's work, revenge has continued to be identified as a motive for a significant proportion of arson offences.

Another point made by Rider is that, as well as observable motivations, unconscious motivations may play a part in an individual's firesetting. The individual may not be able to account for why he or she has lit the fire (1980a: 11). This does not necessarily suggest that the person has acted on the basis of a mental illness of psychological disorder. The person may harbour a need to express anger or hostility which they do not consciously recognise. Common characteristics of arsonists revealed through psychological profiling (from Rider 1980b: 8) are summarised in Table 2.

Icove and Estepp 1987

Icove and Estepp (1987) analysed data from 1,016 interviews with juveniles and adults arrested in the US state of Maryland for arson and fire-related crimes, primarily between 1980 and 1984. The sample included 504 arrests for arson, 303 for malicious false alarms, 159 for violations of bombing, explosives or fireworks laws and 50 for miscellaneous fire-related offences (p 17). Through this analysis the authors sought to create and promote the use of motive-based offender profiles of individuals committing incendiary and fire-related crimes.

Table 2: Profiled characteristics of arsonists

Characteristic	Profile
Age	Firesetters tend to young, with elevated prevalence around 17 years of age; about 66 per cent of arrested arsonists are 20 years or younger
Sex	The overwhelming majority are male
Race	There is no evidence of racial correlations in arson
Intelligence	Studies suggest that firesetters tend to be of below-average intelligence, possibly with an intellectual disability; however this may be a sampling artefact
Education	Most firesetters studied have shown poor academic performance and most young firesetters exhibit problems in school
Family environment	There is a strong tendency for firesetters to come from dysfunctional families, with a high incidence of family breakdown, harsh and inconsistent parenting, absent or uninvolved parents
Social relationships	Firesetters typically experience difficulty in forming and maintaining close relationships, especially intimate ones; this may be due to troubled family backgrounds not facilitating development of social skills
Marital ties	Firesetters typically experience marital difficulties and sometimes problems with sexual adequacy
Employment history	Firesetters are characterised by poor occupational adjustment
Emotional–psychiatric disturbance	Studied firesetters show very high levels of psychological disorders and psychiatric disability They may exhibit deficits in self-esteem and self-control. The high levels of these problems may be a sampling artefact
Solitary offending	Adult arsonists and child firesetters tend to set fires when they are alone, whereas adolescents often set fires in pairs or groups
Criminal history	Most convicted arsonists studied have shown criminal histories, most commonly property crimes, whereas convicted non-arsonists are more likely to have committed violent crimes. The high levels of prior offending may be a sampling artefact, as the existence of prior offences is more likely to lead to incarceration

Source: Rider 1980b: 8

The main targets for the offences were residential properties (44%) and educational properties (31%). Relevantly, fields and forests were the next most common, being targeted in 10 per cent of the offences. In order of their occurrence, Icove and Estepp found vandalism to be the most common motive, at 49 per cent of all offences (p 18). Excitement was the next most common at 25 per cent, followed by revenge (14%). Crime concealment accounted for only two per cent, while arson committed for profit was almost non-existent in this sample (1%).

Juveniles committed almost all of the vandalism offences (96%) and typically targeted schools (p 19). These juveniles lived largely in lower middle class homes (47%) with both parents (63%). They tended to light fires using materials on hand (46%). The majority lived within one mile of the crime scene (51%) and most committed the offence with one or more companions (73%). Many remained at the scene of the fire to observe the resulting activity (41%).

Icove and Estepp found (p 19) that when fires were lit for excitement, this was mostly by juveniles (69%). Most of the offences were perpetrated as thrill-seeking (47%) or attention-seeking (43%), though a small number were carried out by firefighters wanting some action (7%) or trying to gain hero status (two offenders in the sample). Overall, excitement-motivated offenders tended to no longer live with their parents (55%). Most denied using alcohol or drugs (69%), but many (47%) had previous contact or arrests by fire or police officials. The offenders usually lived close to the crime scene (72%) and acted alone (53%). A majority of the offenders remained at the crime scene (62%).

Adults usually committed the revenge-motivated offences (81 per cent) and around half were single (53%; p 19). There was a large representation of female offenders in the revenge group (28%). Revenge-motivated arsonists usually targeted residential properties (72%). A little over half of these offenders used alcohol, drugs or both prior to or during the offence (55%; p 20) and most had prior contact with police or fire officials for offending behaviour (69%). Revenge-motivated arsonists tended to act alone (64%) and many left the crime scene and did not return (42%).

Icove and Estepp analysed the type of property targeted against the motive underlying the arson attack (p 22). Residential properties were targeted in roughly similar proportions by those motivated by vandalism, excitement or revenge. Educational facilities were ignited almost solely through vandalism. Pertinently, Icove and Estepp found that fields and forests were targeted in equal proportions by those motivated by vandalism and excitement, as well as a small number motivated by revenge (p 22).

Vreeland and Levin 1990

Vreeland and Levin (1990: 32) suggest there are three major groups of firesetters:

- arson-for-profit firesetters;
- solitary firesetters; and
- group firesetters.

Within the group of 'solitary firesetters', Vreeland and Levin draw heavily on the earlier work of Lewis and Yarnell (1951), including in this category all those who act alone in setting fires motivated by jealousy, revenge, suicidal intentions, would-be hero goals and

pyromania. Under the heading of 'group firesetters' are included those who act together to start political fires, vandalism fires, riot fires as well as the groups of volunteer firemen identified by Lewis and Yarnell. Other than those who are motivated by profit, it seems that for Vreeland and Levin the motives and other factors underlying the firesetting are less important than whether it was committed alone or in company.

Vreeland and Levin cite a number of studies which show that firesetters tend to be intellectually challenged, with a majority exhibiting below-normal levels of measured intelligence (p 37). They also cite studies which have found that arsonists commit significantly higher numbers of crimes against property than non-arsonist controls, but lower numbers of crimes against persons (p 39). They suggest that arsonists have difficulty externalising aggression and have a fear of retaliation from others, therefore they direct their aggressive feelings towards inanimate objects.

Identified by the authors are difficulties that arsonists tend to exhibit in terms of dysfunctional family backgrounds, relationship problems as well as deficits in self-control, self-confidence and social skills. It is questioned why firesetters choose to respond to these difficulties through firesetting. As the authors note, firesetting is only one behaviour among a range of maladaptive behaviours seen in these individuals, and others may respond to similar difficulties by engaging more commonly in other antisocial behaviours (p 40).

As noted earlier, the authors suggest that the attraction of firesetting as a response may stem in part from the reward offered by the immediate consequences of firesetting. Second, it is suggested that if an individual is lacking in self-confidence and has been unsuccessful in past social interactions, he or she may exhibit aggressive impulses in a way that avoids interaction or the possibility of confrontation with another individual (p 41). Firesetting allows this kind of indirect display of aggression. A further possibility is that firesetting is a way for the individual to feel they have been able to gain control of their environment in a way that family and social difficulties have previously prevented (p 41).

Douglas, Burgess, Burgess and Ressler 1992

The work of Douglas, Burgess, Burgess and Ressler (1992) has been central to the development of criminal profiling, as carried out by the FBI's National Center for the Analysis of Violent Crime. The authors worked from an understanding of the motives underlying arson offending, and a consideration of different patterns of offending, to develop profiles of the types of people most likely to carry out particular forms of arson.

Douglas et al. identified six different types of arson, based on motive (pp 59–60):

1. vandalism-motivated arson:
    a. wilful and malicious mischief;
    b. peer group pressure;

2. excitement-motivated arson:
    a. thrill-seeker;
    b. attention-seeker;
    c. recognition (hero);
    d. sexual perversion;
3. revenge-motivated arson:
    a. personal retaliation;
    b. societal retaliation;
    c. institutional retaliation;
    d. group retaliation;
    e. intimidation;
4. crime concealment-motivated arson:
    a. murder;
    b. suicide;
    c. breaking and entering;
    d. embezzlement;
    e. larceny;
    f. destroying records;
5. profit-motivated arson:
    a. fraud:
        i. insurance;
        ii. liquidate property;
        iii. dissolve business;
        iv. inventory;
    b. employment;
    c. parcel clearance;
    d. competition;
6. extremist-motivated arson:
    a. terrorism;

b. discrimination; and

c. riots/civil disturbance.

Douglas et al. also identified three different forms of arson, based on patterns of offending, conducive to analysis by psychological profiling (pp 79–80):

1. serial arson – the setting of three or more fires with a cooling-off period in between;
2. spree arson – setting three or more fires at separate locations with no emotional cooling-off period; and
3. mass arson – setting three or more fires at the same location during a limited period of time, for example, fires on separate floors of a multi-storey building.

The authors perceived arsonists as falling into two basic types, based on their overall approach to the offence (p 61):

1. organised arsonist:
   a. typically uses elaborate incendiary devices;
   b. leaves little physical evidence;
   c. adopts a methodical approach to setting the fire;
2. disorganised arsonist:
   a. uses materials on hand;
   b. uses matches, cigarettes or easily obtained accelerants (petrol, lighter fluid); and
   c. more physical evidence left (footprints, fingerprints etc).

Based on these various groupings, Douglas et al. developed comprehensive profiles of the characteristics to aid in identifying those most likely to be carrying out each kind of arson offence. These are extensive so are not all detailed here; rather a summary is presented of those most likely to be relevant to this paper's core issue of bushfire arson (Table 3).

Fineman 1993

Fineman (cited in Van Biema 1993: 36) has determined that 60 per cent of arsonists fall into a 'curiosity' subgroup that includes children and teenagers. The remaining 40 per cent includes those who burn down buildings as a form of revenge and some who gain sexual excitement from fires and may tune into emergency radio frequencies to find where police and fire brigade activity is being directed. Fineman considers that most arsonists

Table 3: Characteristics of different types of arson offence

Vandalism-motivated arson

- Most commonly targets educational facilities but also residential and vegetation
- Uses available materials
- Usually multiple offenders
- Spontaneous and disorganised
- Usually male, juvenile
- Usually flee scene; if they return, usually view out of sight and from a safe distance
- Lives with father and mother in single-family housing less than one mile from crime scene
- Lower to middle socioeconomic status
- Alcohol/drugs not used
- Prior contact with police or fire department
- Poor school performance

Excitement-motivated arson

- Rarely intends to hurt people
- Multiple offenders rare
- Matches and cigarettes (for vegetation fires)
- 10 or more years of formal education
- Middle to lower-middle socioeconomic status
- Prevalent contact with police/fire department
- Emotionally inadequate; particularly with heterosexual relationships
- Selects location where activity can be viewed from a good vantage point
- Sexual perversion (in small percentage of cases; involves ejaculation, faecal deposits, pornographic materials; uses available materials; small fires)
- Uses materials on hand
- Uses incendiary devices and time delays
- Juvenile, young adult, male
- Not employed
- Alcohol/drugs usually not used
- Serial offenders common
- Targets residential property, 'dumpsters', vegetation, lumber piles
- Some offenders do not leave crime scene; those who do usually return later and observe from distance (drive-by)
- May be affiliated with public safety organisation

Revenge-motivated arson

- Usually residential property or vehicles
- 10 years or more of formal education
- Low to middle income
- Victim is of central importance; victim usually had some history of interpersonal conflict with offender
- Does not return to crime scene – distances self and establishes alibi
- Alone at crime scene
- Predominantly adult male
- Usually employed – blue-collar
- Alcohol and/or drug use
- Males often use excessive accelerant such as 'Molotov cocktail' or gasoline; females females typically use lighter fluid
- May increase alcohol consumption after offence and have uncaring attitude towards victim

Table 3: Characteristics of different types of arson offence (con't)

Serial arson

- Targets are opportunistic or random
- Disorganised crime scene; physical evidence often left behind; uses materials on hand
- Usually male; average age older than typical single event arsonist
- History of substance abuse
- History of police contacts/arrests – usually minor nuisance offences
- Extremist serial arsonist (well educated; above-average intelligence; highly mobile; focused attack—specific targets; more sophisticated incendiary devices; more organised crime scene with little or no physical evidence
- Less educated, underachiever
- Usually lone offender, but another party may be aware of activities
- Poor interpersonal relationships; socially inadequate; erratic employment; unskilled; often unemployed
- Lives close to scene – walks to it
- Time of day – afternoon to early evening (younger offenders); after midnight (alcohol use/abuse common)

Spree arson

- No particular characteristics identified – look to other classifications for identification based on motive

Mass arson

- No particular characteristics identified – look to other classifications for identification based on motive

Source: Douglas et al. 1992: 63–80

will target unoccupied homes or areas in a conscious effort not to harm life, but suggests that those lighting wildfires in populated wildland areas of California in 1993 were much more dangerous. These firesetters, he suggested, were a separate category and were acting out of 'pure malice and intent' (Van Biema 1993: 36).

Barker 1994

Barker (1994, cited in Drabsch 2003: 12) after reviewing the available psychiatric literature, sorted the various theories into five categories:

1. Acquisitive
   An acquisitive arsonist sets a fire or fires in the course of gain, such as to fraudulently claim insurance proceeds. Landlords may set fire to properties to drive out tenants and clear the building to facilitate development. Fires may be used to harm competing businesses.

2. Vindictive
   A vindictive arsonist is motivated by jealousy or revenge and seeks to cause suffering to another. State-owned educational facilities may be a particular target.

3. Instrumental
   The instrumental arsonist lights fires as a reaction to a particular event and usually to achieve a particular end. This might be to conceal a crime, as a terrorist action or to make a political statement. The firesetting may also be a cry for help or a method of self-destruction.

4. Cathartic
   Fires are lit as a result of tension or anger. The tension may be sexually motivated and the fire may be lit for sexual pleasure, for other kinds of pleasure or excitement, by vandals to relieve destructive urges or for boredom or simply to relieve tension.

5. No obvious motive

Prins 1994

In his 1994 work on the motivation and management of firesetting, Prins noted that people set fires for reasons that may be complex and ill-understood (p 35). While in some cases their behaviour may be motivated to a greater or lesser extent by a mental disorder, Prins notes the problems associated with assuming a clear relationship between mental disorder and criminality. While in some cases the association may be clear, in other cases Prins suggests a person may be both 'mad' and 'bad' (p 35), suggesting a role for choice and free-will that may be discounted or misunderstood. While noting the value of typologies and classification schemes as a means of ordering knowledge and providing a basis for further work, Prins draws on his own earlier work to highlight the problems of confusion within these schemes.

While Prins contends that some classifications may be based on clear motives (p 36), others may be merely descriptive of disordered mental states that may or may not have determined motives. Motives are not always clear, or a person may act on various motives yet be ascribed to only one of these within a classification scheme. There can be a danger, according to Soothill (cited in Prins 1994: 36) that classification schemes may collapse different categories of explanation together and thereby fail to distinguish between different instances of arson and the characteristics of arsonists. This has also been noted by Wooden and Berkey (1984) who suggest a need to distinguish between behavioural characteristics of firesetters, various types of firesetters *and* their motives.

Bearing in mind the concerns expressed about the structure of classification schemes, but also relying on their potential value, Prins presents a selection of earlier attempts to classify the motives for arson. He cites (p 37) Inciardi's typology discussed above contending that, while it is neat and simple, it indicates a confusion between motives for firesetting behaviour (such as to exact revenge) with the circumstances in which the

behaviours occur (such as within or against an institution). Prins also cites (p 37) the typology developed by Ravataheino from a study of 180 arrested Finnish arsonists:

- insurance fraud;
- revenge, jealousy, hatred, envy, grudge;
- sensation;
- alcoholic and mental patients and the 'temporarily disturbed';
- vandalism;
- pyromaniacs; and
- children under 15.

It is noted (pp 37, 39) that this typology again tends to include both motives (such as to commit insurance fraud or exact revenge) and characteristics (such as being an alcoholic or a child).

Prins then presents a classification scheme based on his own earlier study of imprisoned arsonists (Prins, Tennent and Trick 1985):

1. arson committed for financial reward;
2. arson committed to cover up another crime;
3. arson committed for political purposes;
4. self-immolation as a political gesture;
5. arson committed for mixed motives (for example, in a state of minor depression, as a cry for help, or under the influence of alcohol);
6. arson due to the presence of an actual mental or associated disorder, including:
    a. severe affective disorder;
    b. schizophrenia;
    c. 'organic' disorders; and
    d. mental subnormality or impairment;
7. arson due to revenge motives:
    a. against a specific individual or individuals;
    b. against society or others generally;

8. arson committed as an attention-seeking act (but excluding arson committed under 5 above), and arson committed as a means of deriving sexual satisfaction/ excitement;

9. arson committed by young adults (16 and over) as vandalism; and

10. arson committed by children.

In developing this classification scheme, Prins et al. noted the difficulty of discerning a clear single motive in many cases (Prins et al. 1985: 276). They also did not find any case in the 113 they examined to which they could *clearly* ascribe a sexual motivation, or true pyromania (emphasis in original). While the authors regarded their classification as an improvement over other, earlier classification schemes, they also recognised its limitations. In particular they noted that while most of the classification is aimed at suggesting motives, some elements rely on a description of mental states which affect motivation but are not motives in themselves (Prins et al. 1985: 277). This scheme therefore reflects the kind of mixture of elements seen in most similar attempts.

Prins (1994: 38–40) also presents the findings of a 1988 study by the Home Office which examined 238 offenders involved in 214 detected arson incidents in England and Wales. This study found that some 50 per cent of offenders reviewed acted out of an 'emotional mental state', however, since this was not further defined and many non-arson offences are likely to be committed in such as state, the value of this finding is arguable. Eight per cent of the offenders within the 'emotional state' group were given formal diagnosis of mental illness. Other motives classified in this study were:

- revenge (21%);
- group vandalism (14%);
- disputes (7%);
- individual vandalism (4%); and
- concealment of a crime (3%).

Finally, a typology developed by Cooke and Ide in 1985 is cited (Prins 1994: 40) which lists 10 types of deliberately lit fires. It is acknowledged these incorporate a degree of overlap:

1. insurance fires, ignited by the insured;
2. insurance fires, ignited by a hired arsonist;
3. fires started by business rivals;

4. fires started by employees;
5. fires started by political activists;
6. fires lit to conceal other crimes;
7. fires started by children;
8. fires started by vandals;
9. fires started by attention-seekers and enthusiasts; and
10. fires started by mentally deranged firesetters.

Based on these preceding works, Prins (1994: 40) offers a number of general characteristics of arsonists. He sees arsonists overall as mostly young adult males, many of who have serious relationship problems at both the general and sexual level. A large proportion has alcohol problems and many are of relatively low intelligence.

Drawing on each of the previously presented classification schemes, Prins then presents an amalgam of them as a basis for considering explanations and motives in more detail. The amalgamated classification scheme incorporates (pp 41–72):

- arson committed for financial and other reward;
- arson to conceal other crimes, ranging from theft to murder;
- arson committed for political purposes (whether the primary aim is the damage caused by the fire, or the publicity gained from the action);
- self-immolation (though not seen as arson *per se*);
- arson committed for mixed and unclear reasons (where a single specific motive could not be determined due to the involvement of other factors such as mild depressive illness, an apparent disguised plea for help, sudden separation from a partner or loved one, or alcohol intake);
- arson due to serious mental disorder (schizophreniform illness, affective disorders, organic disorders or intellectual impairment);
- arson motivated by revenge;
- pyromania (distinguished from other categories as pyromaniacs do not have another mental disorder and are not revenge-motivated – rather they derive excitement or satisfaction from involvement in fire-raising. This category therefore includes those seeking to gain recognition as a hero, or to boost self-esteem. It also includes volunteer firemen);

- young adult vandalism (mainly due to boredom); and
- child fire-raising.

A significant finding from a range of studies cited by Prins (1994: 77) is evidence of troubled family backgrounds among juvenile firesetters, with their home environments typically characterised by emotional and social deprivation, absent or non-involved fathers who were often perceived negatively by their sons, and a lack of parental supervision and control. The contribution of family background to childhood firesetting will be discussed in the next chapter, focusing on children.

Rix 1994

A 1994 study by Rix examined 153 adult arsonists who had been referred for pre-trial psychiatric reports. The sample consisted of 129 men and 24 women, with a mean age of 25 years for the men and 31 years from the women (p 23). Of the males, 41 per cent were aged between 16 and 20 years and 25 per cent were aged between 21 and 25 years.

Almost all Rix's subjects (93%) were Caucasian. A significant number (31%) had experienced parental separation during childhood and 25 per cent had attended a special school. Twenty per cent of the men had previous convictions for arson, while 26 per cent of men and 17 per cent of women had a previous history of firesetting. Fifty-five per cent of the males had previous convictions for non-violent offences, while 26 per cent had convictions for violence, with female subjects exhibiting similar rates (p 24).

Half the subjects in this UK sample had committed arson on residential dwellings. No subjects had committed arson in grass, forest or other vegetation settings, though three had started fires on farms (p 24). Thirty-eight per cent of subjects were intoxicated with alcohol or drugs at the time of their firesetting.

The most common motives found by Rix, and their frequency as a proportion of all offences were (p 25):

- revenge (31%);
- excitement (11%);
- vandalism (9%);
- psychotic condition (5%);
- heroism (4%); and
- cries for help or attention-seeking, attempts to be rehoused or attempted suicide.

Perhaps reflecting the nature of the sample, 87 per cent of these firesetters were given some kind of psychiatric or psychological diagnosis, with 54 per cent diagnosed as having a personality disorder (p 29). The next largest group was those with a 'mental handicap', while psychosis, alcohol or other substance misuse, depressive disorder and conduct disorder were also identified. Rix asserted that this was a representative sample, due to the application of an Appeal Court recommendation which meant that all persons convicted of arson would be referred for psychiatric assessment (p 31). Therefore the sample was regarded as representative of all arsonists convicted in the north-east of England at that time. Rix does not acknowledge the obvious point, however, that the sample did not include any firesetters who were either not prosecuted, or were prosecuted but not convicted and awaiting sentence. It is possible that those who were acquitted, or were convicted without sentence, may constitute a less psychiatrically challenged group.

Woodward 1994

The UK Arson Prevention Bureau conducted an analysis of 214 arson cases, involving 268 offenders, occurring over a two-year period from 1991 to 1993 (Woodward 1994: 13). The offenders comprised:

- 181 males over 18 years;
- 47 males under 18 years;
- 35 females over 18 years; and
- 5 females under 18 years.

The bureau's findings of the prevalence of various arson motives is in Table 4.

Table 4: Motives for committing arson

Motive	No. of cases	% of cases
Revenge (including revenge against wife, husband, partner, employer; anger, grudge, frustration)	51	1
Alcohol/drug addiction	46	17
Mental problems of varying severity (including depression, cries for help, personality disorder, mental illness)	45	17
Arson for gain	24	9
Concealing another crime (usually theft)	21	8
Excitement (pyromania)	9	3
Extremism/terrorism	5	2
'Heroics'	3	1
No apparent motive	46	17

Source: Woodward 1994

While a number of other studies have shown a high degree of drug or alcohol use before or during commission of the offence, Woodward considered misuse and addiction to be a primary motive in itself. The case summaries given by Woodward to explain his categories indicate a number of cases where the use of alcohol appears to have reduced inhibitions leading to arson offences (pp13–14). But as Woodward notes, it appears in these cases that there was a primary motive of revenge, and alcohol merely served to facilitate the commission of the offence by strengthening the offender's resolve while loosening their inhibitions. It may be that the offenders would have chosen a different way of expressing their anger had they not been drinking, but it does not appear that alcohol use created the decision to offend in the first place. This is also true in relation to drug addiction and use. While Woodward notes that a number of offenders had active drug addictions at the time of the offence, he does not suggest any reason for concluding that the arson offence was somehow committed in pursuance of this addiction (p 14).

In discussing the excitement motive, Woodward notes that he found few cases that appeared to fit the psychiatric diagnosis of pyromania (p 15). He does cite the case of a part-time firefighter who lit fires in barns because he loved fighting the ensuing fires, and the cases of two women who lit fires for the excitement generated by the firefighters and their uniforms.

Woodward's classification scheme includes 46 arsonists (17 per cent of the total) who started fires with no apparent motive, though he notes that most of the offenders in this category were young males and most of the offences came 'within the all too familiar category of mindless vandalism' (p 15).

In contending that it is mainly the less intelligent arsonists who are caught, Woodward notes that while arson committed in an attempt to defraud insurers constituted only six per cent of his analysis, the Arson Prevention Bureau believes that this type of arson is likely to account for closer to 20 per cent of all arson (p 15). Woodward's contention is that those who commit arson for profit are more likely to be relatively intelligent and able to carefully plan and execute the offence in a way that avoids detection. It is those who do not have the capacity for planning and execution, or those who act impulsively without consciously intending to avoid detection, who are most likely to be caught and therefore skew any analysis of apprehended offenders.

Fineman 1995

Based on a consideration of the literature and extensive experience in clinical practice, Fineman suggests there are two main types of firesetters – non pathological and pathological – and several sub-types within each (pp 39–41). These are as follows.

Non-pathological juvenile and adult firesetters

1. Curiosity type
   These are primarily younger children who engage in fireplay without understanding the consequences of their actions. The resulting fires, due to the child's inability to recognise the need to call for help or take similar action, may cause extensive damage even though there is no intention to cause harm.

2. Accidental type
   This type may include children conducting play or experiments that involve fire, but the fire is not set for the curiosity of witnessing the fire itself. Includes accidents or carelessness by adolescents and adults.

Pathological juvenile and adult firesetters

3. Cry for help type
   Fires are lit to bring attention to an intrapersonal dysfunction (such as depression) or interpersonal dysfunction (such as abuse at home) or vicarious observation (such as parental conflict). The firesetter avoids causing harm and responds well to treatment. This type also includes firefighters or 'would-be heroes' who set fires to attract the attention of peers or the community.

4. Delinquent type (juveniles) or antisocial type (adults)
   This group includes those lighting fires for the purpose of profit, concealing a crime or vandalism. Delinquent juveniles may have scant regard for others but will generally avoid causing too much harm with their fires. Adults are more likely to seek to cause harm.

5. Severely disturbed type
   This type includes those who gain sensory reinforcement from the fires themselves and may continue to set fires to elicit this stimulation. This group includes those who derive sexual satisfaction from fire and pyromaniacs. Others in this type may use fire to self-harm.

6. Cognitively impaired type
   Includes those for whom intellectual impairment or organic brain damage have contributed to issues such as poor judgement, the ability to foresee the consequences of actions and self-control. Cognitively impaired firesetters do not seek to cause harm but their poor judgement may result in the creation of highly damaging fires.

7. Sociocultural type
   These are primarily people who commit fires for political purposes—perhaps as a form of protest, during riots or for distorted religious purposes.

8. Wildland firesetter type
   This may include elements of the delinquent and antisocial types as well as the severely disturbed type. These firesetters may set fires intending that they spread across large areas and possibly into inhabiting areas, or disregard the possibility of these outcomes. They may never consider the possibility of death or injury to animals or humans. They typically regard themselves as victims of society and wish to punish society in some way. They are treatable if caught.

In developing his typology, Fineman argued strongly for the need to base an understanding of firesetting on a solidly formulated model. The model he proposed, based on a dynamic-behavioural formulation, is of sufficient interest to be discussed separately at the end of this chapter.

Holmes and Holmes 1996

Holmes and Holmes (1996: 96) note that arson is committed equally by adults and juveniles, with 49 per cent of offences committed by juveniles. Of these juvenile offences, 26 per cent are set by children aged between 10 and 14. The authors observed that 90 per cent of recorded arson is committed by males. In terms of prior offending, 87 per cent of arrested arsonists in one report (Sharn & Glamser 1994, reported in Holmes & Holmes 1996: 96) had prior felony arrests, with 63 per cent having multiple arrests and 24 per cent having been arrested for arson. Holmes and Holmes (1996: 96) note that the most common motives for arson, as reported by Sharn and Glamser were:

- revenge (41%);
- excitement (30%);
- vandalism (7%);
- profit (5%);
- concealment of crime (5%); and
- mixed motives (12%)

Sapp, Huff, Gary, Icove and Horbert 1996

An in-depth study of the characteristics of serial arsonists and their offences was conducted by the US Federal Bureau of Investigation (Sapp, Huff, Gary, Icove & Horbert 1996). This study provides a firm basis for further refining our understanding of arson perpetrators. The FBI researchers conducted detailed interviews with 83 offenders, examining many

dimensions of the person, their background and their actions. The characteristics found in serial firesetters are consistent with those appearing in many other studies of broader firesetting.

The 83 offenders interviewed had set more than 1,400 recorded fires between them. Sapp et al. found that the serial arsonists were almost all males (94%) and white (82%), while half were aged 27 or younger when interviewed. Given that it may be some time since the offenders began setting fires, or since their last fire before being apprehended, this is quite a young group. Overall they showed poor marital adjustment and relationship histories, with most being single (66%) or divorced (15%). While two-thirds were of average or higher intelligence, their overall academic performance was poor, suggesting difficulties in coping with aspects of the education system and learning that went beyond raw ability. In an echo of the findings of Lewis and Yarnell in 1951, half of these serial arsonists were tattooed while a quarter had some type of disfigurement.

The serial arsonists examined by Sapp et al. had, consistent with many earlier studies, extensive criminal histories. A large majority of the offenders (87%) had prior felony arrests, with 63 per cent of the total group having multiple felony arrests. Many in the group had spent time in institutional settings including prisons, juvenile detention facilities and orphanages. More than half of the serial arsonists reported significant medical histories while just under one-half had a history of psychological problems.

In another finding reflective of that seen in much of the literature, serial arsonists displayed poor occupational adjustment. Only one-third of the offenders had regular occupations and none were in professional positions.

Most of the serial arsonists reported coming from family backgrounds that were financially stable and comfortable or self-sufficient. At the same time, many reported poor relationships with their parents. This was particularly so in relation to fathers, where 43 of the 70 (61%) who responded to this aspect of the questioning reported having relationships with their fathers that were cold, distant or hostile and aggressive.

In relation to the characteristics of the offence itself, Sapp et al. found that in one-fifth of the cases serial arsonists acted together with an accomplice. It is noteworthy that those who acted in company set significantly fewer fires (average 6.1 fires) than those operating alone (average 32.6 fires).

Serial arsonists typically used unsophisticated methods of lighting fires, with gasoline and matches (usually in book-form rather than boxes) being the main tools of ignition. Around one-third of the arsonists remained at the scene of the fire, while a quarter observed the fire and the accompanying action from another location. Forty per cent left the scene and did not return, while most of the remainder returned at some time, usually within 24 hours.

In this sample, 31 of the 83 arsonists lit fires in vegetation with just under half lighting one or two fires. A few arsonists lit far greater numbers of fires, with just under one-third lighting 10 or more fires. Serial arsonists in this study tended to set fires in only one location, suggesting that those who light vegetation fires at one time are perhaps unlikely to light structure fires at another. The authors suggest that many of the arsonists in this sample lit fires in vegetation or in other non-structures such as rubbish bins because they were motivated by the excitement of the fire and it did not particularly matter where the fire was burning as long as they achieved their goal of excitement. Half the fires in this sample were lit within one-half to two miles of the offender's home, with a further 20 per cent lit even closer. Perhaps not surprisingly then, most offenders walked to and from the location, a phenomenon echoed in other research.

Of particular interest to investigators was Sapp et al.'s finding that a very large majority (76%) of these serial arsonists took no particular action to avoid identification. Most of the remainder wore gloves, while a few removed evidence or tried to disguise themselves. That most did nothing to try and hide their involvement is particularly surprising given the relatively low clear-up rate found for this sample (11%, well below the FBI average of 18% for all arson offences).

In terms of motives, a large majority of the arsonists (64%) acted out of revenge, while 27 per cent were motivated by excitement, 23 per cent by emotional problems, 12 per cent by profit and 10 per cent set fires as an act of vandalism. Nearly half listed some form of stress as a precipitating factor and these stressors were roughly equally divided between financial difficulties, conflict with parents or a significant other, a significant life event (such as change of school, death in the family, mother having a baby) and multiple stressors. Not surprisingly given the dominance of the revenge motive, one-third of offenders reported feeling angry at the time they lit fires while small numbers felt frustrated, sad, afraid or happy. Just under one-third experienced a combination of emotions.

Kidd 1997

Kidd (1997: 29) proposed a three category system for arson after considering the classifications offered by Lewis and Yarnell, Scott and Prins:

1. Arson with a motive:
    - insurance fraud;
    - property speculation, planning approvals demolition or site clearance;
    - contractual matters;
    - intimidation;
    - concealment of another crime;

- revenge or jealousy;
- racial or ethnic motivations;
- political/riot/idealistic purposes;
- attempts to be rehoused;
- hindering commercial competition;
- hero or financial aspirations by firefighters, security guards or others; and
- as a method of suicide.

2. Apparently motiveless arson:
   - true pyromania;
   - clinical psychosis;
   - other mental disorder, including sexual deviation;
   - criminal damage and vandalism;
   - as a result of alcohol or drug use; and
   - mental or intellectual incapacity.
3. Juvenile fire involvement:
   - fireplay (including curiosity and experimentation);
   - firesetting (including peer pressure);
   - motiveless arson; and
   - pathological firesetting.

Muckley 1997

Muckley (1997) has also suggested a three-part typology of firesetters:

1. The curiosity firesetter:
   - mainly includes children and young people, and covers the possible growth of behaviour from fireplay to firesetting.
2. The deliberate firesetter:
   - delinquent firesetters may light fires one day and commit other antisocial behaviours the next; delinquents usually work in groups;
   - revenge firesetters.

3. The career arsonist:

    - mainly seen as older adolescents and adults whose interest in fire has become an obsession. Incarceration without proper treatment frequently intensifies feelings of anger and increases firesetting behaviour.

Ritchie and Huff 1999

Ritchie and Huff (1999) examined the mental health records and/or prison files of 283 arsonists, primarily accessed through the FBI's Behavioral Science Unit. An indication of the possible skew inherent in this study's sample is shown by the finding that over 90 per cent of the arsonists examined had mental health histories, the most prevalent issue being schizophrenia (25%). Over half the offenders had been abusing alcohol at the time of their offence and 64 per cent had been abusing a substance of some kind (p 738).

Only 20 per cent of the arsonists in this sample were married and nearly half (48%) were unemployed (p 735). This was an older sample than many other studies, with 27 per cent aged between 30 and 39, perhaps a reflection of the fact that this was a group with a relatively extensive offending history who warranted the attention of the FBI's Behavioral Science Unit. In fact, 71 per cent of the sample had a criminal history with misdemeanours while 52 per cent had prior felonies (p 735). More than a quarter had previous convictions for arson.

The most prevalent motive found by Ritchie and Huff was revenge, accounting for over 37 per cent of offences (p 735). Crime concealment and vandalism each accounted for around 15 per cent of the offences. In only four per cent of the cases in this sample was vegetation a target of the arson attack (p736).

A dimension considered by Ritchie and Huff, which has not been covered by other researchers, is that of impulsivity and compulsivity. Half the arsonists in this sample acted impulsively, most commonly as a result of revenge-fuelled anger. Very few of the offenders showed evidence of a compulsive fascination with fire (p 738). The authors found little evidence to support older psychoanalytic theories that firesetting is associated with release of sexual tension (p 739).

Kocsis 2001a, 2001b, 2002

Kocsis has applied the principles of criminal profiling to serial arson offences. He has identified four distinct offence patterns which share common behaviours distinctive to serial arson:

- sexual;

- resentment;
- anger;
- wanton excitement.

The sexual pattern identified by Kocsis is characterised by an offender whose firesetting is associated with sexual expression and/or release (2001a: 21, 2001b: 24). A defining feature of this pattern is evidence of sexual activity occurring in or near the target, perhaps evidence of ejaculation, pornographic material or bodily waste. Typical targets of sexually motivated arsonists are places with a relatively low risk of detection and apprehension yet are easily accessible to the public, such as bathrooms or abandoned buildings.

Kocsis notes that his 'resentment' category is similar to the revenge motive highlighted in other classification schemes, but distinguishes it on the basis that resentment serial arson is typically directed at state-owned educational facilities, and there may be no direct relationship between the target and the offender (2001a: 23, 2001b: 25). In this sense there may be a degree of displacement of the offender's anger from another person, organisation or institution onto the school or other facility they target.

The resentment category is also different from the 'anger' pattern, where an individual's rage or malice is expressed through arson (2001a: 23, 2001b: 25). This kind of arson is typically perpetrated against residential dwellings, expressing an element of personal harm directed towards the occupant or occupants. This may be accompanied by damage of the property or contents before ignition of the fire. The personal harm incorporated in this offending pattern instils an element of violence that is not necessarily found in the other patterns.

Kocsis' fourth category is serial arson committed out of a desire for 'wanton excitement'. Kocsis describes this as 'possibly the most malignant as it represents an offender who associates apparently random destruction with gratification' (2001a: 23). The 'excitement' arsonist does not act on the basis of resentment or anger and does not usually target residences or schools. Pertinently, this type of arsonist usually targets low-risk, easily accessible places, particularly vegetation and bush areas. The 'excitement' arsonist generally brings items to the target to aid ignition, ranging from simple accelerants to delayed ignition devices.

While Kocsis has identified four behavioural patterns associated with serial arsonists, he has also identified six broad motives for arson generally (2002):

- profit;
- animosity;
- vandalism;

- crime concealment;
- political objectives; and
- psychopathological factors.

In discussing his animosity category, Kocsis notes that crimes committed due to feelings of anger, hatred or revenge are not unique or intrinsic to arson, but that these feelings can find expression in firesetting (2002: 2). He argues that his category of 'animosity' is more appropriate than the commonly seen category of revenge, as the latter fails to include the psychological factors that may be involved, such as displacement of anger onto a target removed from the object that has precipitated the feelings. Thus a person aggrieved by an employer may not necessarily target the place of employment, as a revenge motive might require, but may set fire to bushland.

In relation to vandalism, Kocsis suggests this is possibly the hardest motive to comprehend due its seemingly purposeless nature (2002: 2). There is no clear reason why a person may start the fire, beyond one or more influences such as an apparent disregard for others' rights, a mischievous mindset, peer pressure or boredom.

In his discussion of psychopathological factors that may contribute to arson, Kocsis notes that a public perception of arsonists as suffering from a mental disorder may derive from poor understanding and the overgeneralisation of disorders such as pyromania (2002: 3), a point that is considered (see below) by Shea (2002). Kocsis notes that empirical studies of arson in psychiatric populations have found the most common diagnoses to be schizophrenia, personality disorders, mental handicap, substance abuse, mood disorders and pyromania. In relation to pyromania he notes the debate around whether it really exists as a discrete disorder and that perhaps the one point of agreement in the debate is how extremely rare it is (2002: 4).

Shea 2002

While Shea's (2002) paper sought to specifically address bushfire arson, and is one of the few specific papers on this topic, his discussion of characteristics frequently seen in bushfire arsonists also has broader application. For this reason, Shea's work is presented in this chapter rather than in the part of this report dealing specifically with bushfires. Shea examined the role of a number of major characteristics in arson behaviour.

Mental illness

The literature has shown that a significant proportion of people setting fires have exhibited mental illness. The link between the illness and the firesetting behaviour cannot simply be assumed, though, and it must always be asked whether the behaviour is actually related

to the symptoms of the illness (Shea 2002: 2). The literature tends to reflect an assumption that where someone has a mental illness and is exhibiting antisocial behaviour, there is necessarily a causal link involved. Most researchers appear not to take into account that many people with a mental illness, even a severe and untreated illness, will experience periods of lucidity and 'normality' where their thoughts and behaviours are not under the influence of their illness. Mentally ill persons may commit antisocial acts during these periods based on motivations unrelated to their illness.

Even during a period when a person's illness is active and influencing their behaviour, not every behaviour they perform – antisocial or otherwise – is necessarily attributable to their illness. Responding to the behaviour under the assumption that a person's mental illness has caused it carries the risk that other causative factors may not be addressed, leading to the possibility that even when the illness is successfully treated the firesetting behaviour may recur.

Brain damage and intellectual disability

Similarly, while people with organic brain damage or intellectual disability may light fires, the damage or disability may not be the cause of the firesetting behaviour (Shea 2002: 2). Most people with brain damage or intellectual disability do not light fires. When they do, the action may be the result of any of the range of motivating factors that various researchers have identified. The existence of brain damage or an intellectual disability may become another factor in the person's behaviour and may influence the way they respond to other contributing factors.

As Shea has noted (p 2), people with organic brain damage or intellectual disability may suffer from problems such as a diminished capacity for abstract thinking, poor memory, impulsivity, suggestibility, an inability to generalise from one situation to another and the inability to relate present behaviour to possible future consequences. Any of these kinds of problems could influence someone who experiences another motivation, such as anger or a desire for attention, to act on this other motivation in an antisocial way.

Drugs and alcohol

There does not appear to be any evidence suggesting a strong link between alcohol and drug use in bushfire arson, though it has been found to be a factor in other forms of arson. Alcohol and drugs can reduce inhibitions and affect the conscience that would otherwise prevent some people from committing an act such as firesetting. Some drugs can also produce delusions and hallucinations (p 2), particularly if a person has an underlying condition such as schizophrenia. By altering a person's mental state in this way, drug use may contribute to antisocial acts, including the lighting of bushfires. It seems likely that

reduced inhibitions may contribute to bushfire-setting in some cases, particularly if the act is based on a motivation such as anger or vandalism.

Pyromania

While many early studies of firesetting appeared to liberally apply the diagnostic category of pyromania, and assigned many research subjects to this category, it has more recently become accepted that the occurrence of pyromania as defined in the *Diagnostic and statistical manual of mental disorders*, fourth edition (DSM-IV) is rare (see Shea 2002: 3). Pyromania falls into the category of 'impulse control disorders', a residual classification used when the behaviour is not a clear component of some other disorder (Blackburn 1993: 73). The essential features of the disorder are:

1. failure to resist an impulse, drive or temptation to perform an act which is harmful to the person or others;
2. increasing tension or arousal prior to the act; and
3. the experience of pleasure, gratification or release at the time of committing the act (Blackburn 1993: 73).

Blackburn (1993: 74) expresses some doubt as to whether impulse control disorders exist as a distinct class of act. He argues that an 'impulse' is a circular inference of cause from the behaviour that supposedly arises from it. 'Failure to resist the impulse' is inferred from a simple observation that the behaviour has occurred. He notes that acts arising from impulse control disorders are distinguished from other acts due to the lack of another apparent motive, such as financial reward or procurement of vengeance. If a person lights a fire when they do not have any clear reason for doing so, they must have had an impulse to light the fire which they failed to resist, therefore they must be a pyromaniac.

This reason is not only circular but, as Blackburn notes (1993: 74), the lack of a clear motive may simply be a matter of judgment on the part of the person applying the label of 'pyromaniac'. If the firesetter did in fact have a reason, even an obscure one, they would immediately cease to be a pyromaniac even though the diagnosis may remain with them.

Shea puts the concerns around the application of the pyromania classification quite bluntly, stating that 'it is not a diagnostic category of any scientific significance' (Shea 2002: 3). Of particular import to him is that the diagnostic criteria for pyromania does not require that a person be *unable* to resist the impulse to set fires, rather that they exhibit a *failure* to resist the impulse. This difference is critical, as the failure to resist an impulse that the person could have resisted establishes a role for free will which the influence of the pyromaniacal condition should remove, and strongly suggests the existence of other motivations more significant that the pyromania itself. As Shea (2002: 3) puts it:

> …what the DSM-IV is saying, in brief, is that when all the usual causes and motivations are excluded, there is a group of people who like lighting fires because of the excitement that surrounds both lighting them and putting them out. Pyromania is simply a shorthand label for that behaviour. It does not mean that they have a psychiatric syndrome known as pyromania, which causes them to light fires.

The value of the pyromania classification as a tool has also been questioned by Doley (2003e) who cites a number of studies showing that the reported incidence of pyromania is now very low. She also cites studies showing that the understanding of pyromania held by the community and by fire investigators is generally misleading and inaccurate.

Dynamic-behavioural model (Fineman 1995)

In trying to develop an understanding of why some people choose to start fires, it is worth giving some special consideration to the work of Fineman (1995). A typology developed by Fineman is set out above. In developing this typology, Fineman argued strongly for the need to base an understanding of firesetting on a solidly formulated model:

The model that all firesetters are sexually repressed or obsessed, active or latent homosexual, enuretic, cruel to animals and of subnormal intelligence must give way to a model that more accurately reflects the literature as well as the clinical impressions of those clinicians and fire service professionals who frequently evaluate firesetters. (p 33)

The model proposed by Fineman is based on a dynamic-behavioural formulation which views firesetting as the product of an interaction between three forces (p 42):

- dynamic historical factors that predispose the firesetter toward a variety of maladaptive and antisocial acts;
- historical environmental factors that have taught and reinforced firesetting as acceptable; and
- immediate environmental contingencies that encourage the firesetting behaviour.

Dynamic historical factors in this formulation include past areas of dysfunction concerning family background, peers, academic performance, personality and health (Fineman 1995: 43). These factors therefore include many of the areas of difficulty and dysfunction that other researchers have identified as characterising the backgrounds of firesetters. A critical aspect of the way these factors operate in the dynamic-behavioural formulation is that they tend to predispose an individual to a variety of maladaptive behaviours and antisocial acts. As noted elsewhere, some individuals may respond to dysfunctional histories by engaging in firesetting whereas other individuals, or indeed the same individuals

at other times and places, may engage in other types of vandalism, unruly behaviour, substance abuse or other antisocial acts.

The decision of an individual to engage in firesetting, rather than some other form of antisocial behaviour, is largely driven by historical environmental factors that contribute to the development of at-risk fire behaviours. These factors might include a lack of early parental supervision of a child's fire interest or fireplay, a lack of education and understanding of fire safety, a history of previous firesetting and the ways in which parents or significant others have responded to previous firesetting (Fineman 1995: 44). The risk that an individual will choose fire to express conscious or subconscious motives becomes a combination of historical factors, together with others such as the individual's ability to express anger directly and appropriately, and the degree of their interest or fascination with fire. For troubled children, having parents who smoke may contribute to them becoming involved in firesetting, due to the availability of matches and cigarette lighters, and because the purposive use of fire is a familiar aspect of their home environment (Porth & Hughes 2000: 6).

The likelihood that a person will continue to set fires, harm others or engage in extensive property damage can be evaluated as a function of a cluster of variables comprising the immediate environmental contingencies. These might include (Fineman 1995: 44–46):

- crises or trauma affecting the firesetter, such as a relationship breakdown, expulsion from school (particularly for adolescents) or experiencing physical or sexual abuse (particularly for children);
- characteristics of the fire itself, such as the location, means of ignition and whether it was deliberate or accidental, whether the person acted alone or in company and similar factors which might help to disclose underlying motives;
- thoughts, particularly distorted ones, and feelings the offender experiences both before and after setting the fire; these may be influenced by drug and alcohol use; and
- type and intensity of events, external and internal, that reinforce firesetting behaviour. External reinforcements may include financial or other benefits gained from the fire and avoiding detection. Internal reinforcements may include pleasurable feelings gained from the action, such as feelings of power and control, excitement or sexual satisfaction as well as the feelings derived from the support of peers when the fire is set as an act of group vandalism.

Arson classification schemes, typologies and profiles: some difficulties

There is no doubt the various attempts that have been made throughout the literature to classify arson into schemes or typologies, and the efforts to develop profiles, have contributed greatly to an understanding of arson and its perpetrators. Overall, however, these attempts have not been without some significant limitations and it is worth devoting some attention to these.

Studies that have led to the development of arson typologies have sometimes lacked a sound empirical base, or have been based on research samples likely to skew the nature of the classification scheme. Overall the literature contains few studies using sound and well controlled methodologies. Most studies are largely conjectural and based on speculation and observations derived from the authors' experience with firesetters in a clinical or investigative setting (see Vreeland & Levin 1990: 32).

Where studies have used empirical methods, many have been based on psychiatric populations comprised of detected offenders who have been referred for assessment, diagnosis or treatment. In most cases these have not been compared alongside any kind of control group of non-offenders, or offenders not considered to require psychiatric intervention. Typologies drawn from samples of this type are likely be skewed towards more serious offenders and those displaying more disturbed or troubled behaviour. Many older studies have been based on an assumption that most people lighting fires fit the psychiatric diagnosis of a 'pyromaniac', in that their firesetting behaviour is the result of their inability to resist sexually motivated impulses. While studies have consistently shown that those meeting the criteria constitute only a small proportion of the arson-offending population, there persists a tendency to adopt a circular form of reasoning which essentially suggests firesetting is an abnormal, deluded and psychiatrically unhealthy behaviour, so those who intentionally set fires must be mentally abnormal, deluded and psychiatrically unhealthy.

The reliance on using arson offenders who have been detected, and generally have been charged and possibly convicted, is in itself problematic even where the sample has not been further narrowed to a psychiatrically defined population. It is likely, as a number of authors have noted, that arsonists who have been caught may be atypical of the broader group of arsonists. It may well be that the arsonists who are caught are less skilful, less intelligent and are acting out of motives or on the basis of conditions which mean they are less likely to make efforts to avoid detection. This problem tends to arise in any study which relies on convicted or incarcerated offenders as a basis for generalisation to the broader offending population. This problem may arise more acutely in the case of arson, for a number of reasons, as follows.

The official clear-up for all types of arson offences is historically quite low, indicating that only a fairly small proportion of offenders are ever apprehended. This compares with an offence category such as homicide, where a far greater proportion of offences are resolved. When attempting to analyse homicide offenders, then, one can be reasonably certain that any statistically large enough sample of offenders will be representative of the whole. In analysing arson, however, even the largest sample may still not be representative of the whole offending population.

It may also be that the small proportion of arson offenders apprehended is sufficiently unrepresentative and skews the proportions of offending that are attributed to any given motivation. For instance, a number of studies have shown that a significant proportion of arson is committed for reasons of revenge. This implies that revenge is the motive behind a significant proportion of all acts of arson, including those where the perpetrator goes undetected. It may be, however, that revenge-motivated arsonists are detected and apprehended at a greater rate than some other arsonist, perhaps because they are acting in an emotionally heightened state, are quite possibly intoxicated, are more focused on committing damage than disguising evidence of their activities and have left behind clear circumstantial evidence of their motives. Of course this is purely speculative, but the example does serve to highlight the fact that typological categorisations tend to be, by their nature, speculative as well.

3 Firesetting by children: motives and classifications

It is apparent from the general literature on arson and deliberate firesetting that a large proportion of firesetting is conducted by children. For instance, in the United States, children and young people are thought to be responsible for 60 to 75 per cent of deliberately lit fires (Stanley 2002: 8). The proportion of juvenile arsonists is higher than for other crimes and appears to be rising (Drabsch 2003: 13).

As will become apparent, when children light fires it is usually the result of play or experimentation. It is generally not malicious and children below a certain age (10 in most places) cannot form a legal intention to commit a crime. For these reasons, children's firesetting for the most part falls outside the definition of arson as used in this paper. Nonetheless, some older children do commit arson, and any child has the potential to become an arsonist in later life, particularly if they have issues and engage in problematic firesetting that is not treated. The ability to treat and prevent firesetting behaviour in children also holds promise for preventing them engaging in arson as adults.

So even though child firesetting is in some ways outside the scope of this paper and bushfire arson research, it is essential that it be examined. There is a very extensive literature on children's use of fire, perhaps larger than that on adults. The following is a sample selected to provide a core understanding of children's firesetting, without the risk of losing this understanding in too lengthy a review.

It is also apparent that the motives underlying firesetting in children, especially children too young to form a criminal intention, are different in many respects from adult firesetting. While many studies have included children in their analyses of motives and their classification schemes, they have generally regarded children and juveniles as a separate group from adult firesetters. At the same time analysis of the literature is made harder by inconsistency in the use of terminology, and by the lack of distinction in some parts of the literature between children, adolescents and adults. This approach has the potential to create some obscuration, particularly in older children or adolescents, when the line between childhood and adulthood starts to blur. There is, however, the potential for greater obscuration if children are not treated separately, and the particular characteristics of childhood firesetting are lost. The separation of children from adults in various studies emerges as sufficiently important for the same approach to be adopted in this paper.

The nature of childhood firesetting has been summed up by the observation that there seems to be two types of child firesetters – those who are merely curious about fire and those who are intentionally setting fires (Drabsch 2003: 13). Curiosity firesetters are usually five to ten years old, although as will be seen there are instances of firesetting outside this rather arbitrary age bracket. Older children who light fires tend to do so as a result of aggression, sensation-seeking, social skills deficits, deviance, vandalism, covert antisocial behaviour and attention-seeking behaviour.

Lewis and Yarnell 1951

In their in-depth study involving over 200 children firesetters, Lewis and Yarnell saw fireplay as the normal outgrowth of a fascination with the phenomenon of fire, which infantile imaginations endow with magical properties (pp 283–284). Children who experience emotional difficulties which are not addressed, however, may carry their interest with fire through the maturation process where it can develop into a lasting obsession (p 284).

In their examination of firesetting by the adolescent boys in their sample, Lewis and Yarnell found the basis of pyromanic behaviour, as they saw it, to lie in the turmoils and stresses of adolescent sexual development (pp 311–312). They saw firesetting as resulting from the masculine struggle to attain social prestige and power and cope with conflicts deriving from resistance to the passage into adulthood. Drawing on Freudian underpinnings, the authors saw adolescent firesetters as sexually immature and markedly concerned with masturbation and urethral eroticism (p 313). The adolescents see punishing and dominating aspects of their mother as overshadowing the gentle protection she afforded them when they were infants, and they 'fear all women as awesome creatures capable of destroying them' while maintaining a jealous hatred of their fathers (p 313). Fire gives these youths a means of revenge against the despised father figure, while providing sensual satisfaction and cleansing the guilt derived from masturbation.

In their analysis Lewis and Yarnell distinguish between these motives of adolescents who set fires as a solitary pursuit, and those who set fires in groups. Adolescents were twice as likely to set fires in groups as individually and inevitably did so in male-only groups (p 334). In these cases the fire activity was motivated by a desire for excitement or simply because they 'wanted to see a fire' and the boys acted in groups as mutual support against authority during their period of revolt (pp 334–335).

Scott 1974

Scott's examination of children firesetters draws mainly on the work of Bender in the late 1930s who examined children with a history of firesetting who had been referred for psychiatric treatment (cited in Scott 1974: 86). Thus the analysis is skewed towards those displaying relatively serious firesetting behaviour and those more likely to display apparent neurological or psychiatric difficulties.

Scott draws on the work of Bender and others to show that those children for whom firesetting progresses beyond 'normal' experimentation to ongoing problematic behaviour are likely to experience difficulties at school and suffer from a lack of love and security in their home life as well as deprivation of basic material needs (pp 89–90). Firesetting thus becomes the basis for aggressive and destructive fantasies directed at the parents. While

firesetting can be a normal component of childhood experimentation, it also has the potential to be part of a behaviour disturbance which can become ingrained and develop into patterns that persist into adulthood (p 92).

Wooden and Berkey 1984

In their 1984 study, Wooden and Berkey examined 536 juveniles apprehended for setting fires on school property in the United States (p 3). The authors grouped juvenile firesetting in four general types:

1. playing with matches firesetters – who are merely engaging in fireplay rather than deliberately setting fires;
2. crying for help firesetters – troubled youngsters who engage in firesetting as a gesture of displeasure with an often chaotic and disruptive home environment;
3. delinquent firesetters – older adolescents and teenagers who engage in arson as a form of juvenile delinquency; and
4. severely disturbed firesetters – set fires with great frequency and ritual (p 3).

Consistent with other studies, Wooden and Berkey found that the major problem shared by these youngsters is coming from a severely disturbed family environment. In many cases the father was absent but where he was present, significant problems existed between the parents or between the father and children. Many child firesetters have been victims of sexual abuse (pp 3–4).

Poor performance in school is a common characteristic of child firesetters (p 4). The children may be intelligent but experience problems with truancy, disruptive behaviour and hyperactivity. Difficulty in school is perhaps the reason that young firesetters often target school property.

Wooden and Berkey found child firesetters often have poor relationships with their peers (p 4). Inadequate social skills often lead to a lack of significant friendships. At the same time many firesetting children lack assertiveness, so may be subject to manipulation by their peers.

Overall, Wooden and Berkey found child firesetters to be characterised by multiple problems. They identified 33 behavioural characteristics that distinguish firesetters from non-firesetters (p 5). Within this group of characteristics, the two most distinguishing characteristics shared by firesetters but not others were involvement with stealing and with truancy and related school problems that contributed to poor academic performance. Child firesetters more frequently had long-term behavioural problems than non-firesetters and were more easily led by peers (pp 31–2).

Other significant behavioural problems shared by firesetters but not others included lying, playing alone, impulsivity, fighting with siblings or peers, impatience, being out of touch with reality, jealousy, shyness, hyperactivity, stuttering, difficulty expressing anger, violence and being a poor loser (pp 32–3).

From Wooden and Berkey's study, a picture of what may be seen as a 'typical' juvenile firesetting career emerges (p 5). The 'typical' adolescent firesetter follows a sequence of feeling isolated from family and peers, wandering around before beginning to steal. At the same time, the adolescent begins disobeying and withdrawing from parents and teachers and then, after a time, begins setting fires.

Wooden and Berkey regarded firesetting among children and juveniles to be unlike crimes such as burglary, theft and rape which, in the United States at least, are disproportionately committed by lower-income non-Caucasian males (p 5). In contrast, middle-income Caucasian males disproportionately commit juvenile arson.

In an extension of their examination of children, Wooden and Berkey examined firefighters in one metropolitan fire department. They found some support for a contention that some juveniles start fires because of interpersonal difficulties, grow up to become firefighters, have marital and personal difficulties and produce offspring who become firesetters themselves (p 153). The authors found that 10 per cent of firefighters fit that general pattern and composite profile. They also found that 55 per cent of the firefighters had themselves set 'trouble fires' as youngsters (p 5). Nine per cent of the firefighters' children had set fires against their parents' wishes, suggesting that at least some of the influences that led to the father's involvement with fire may be carried on to the children.

Kafry 1990

Kafry (1990) studied a random sample of 99 eight-year-old boys and found interest in fire was almost universal. 'Fireplay' was carried out by 45 per cent of the boys in the sample (p 47). She also found that interest in fire began very early, with 18 per cent of the group lighting fires before the age of three and a decreasing tendency to light fires after the age of seven (p 48). In considering the question of children's intentions and culpability when lighting fires, it is interesting to note Kafry's finding that most of the boys lighting fires had a high level of understanding about the possible consequences of their behaviour and typically set the fires in places where they could not easily be detected by adults (p 49). Over half the fires set by boys in Kafry's study were set in groups, as part of adventurous play and sometimes involved reactions of excitement to the fire (p 49).

Kafry found children who played with matches to be more mischievous, energetic, aggressive, exhibitionistic and impulsive than those showing no interest in fire (p 52). Compared to his peers, a boy who shows an interest in fire is more likely to often become

involved in adventurous play leading to accidents and has more conduct problems. Kafry noted that this depiction of child firesetters, or 'rascals' as she calls them, was consistent with that found in a number of other studies see cited (see p 52). The similarity in depiction suggested to Kafry:

> …a behavioural continuum, which has on one extreme the repeater firesetters, close to it are the non-repeater firesetters, then those who play with matches and then, at the other extreme, those who are devoid of behavioural problems and risk-taking behaviours. (p 52)

The characteristics of child firesetters found by Kafry and others is similar to those of other children who may not light fires but exhibit similar levels of mischief and accident-prone behaviour:

> The 'rascal' is not only prone to hazardous fire behaviours and accidents but also has similar personality characteristics to those of the hyperactive child as well as the delinquent child. (p 52)

Kafry also found that children who had problematic fireplay were likely to come from families marked by deficiencies in warmth and positive support, with harsh and inconsistent punishments more likely to be found (p 55). These children were more likely than others to come from socioeconomically deprived backgrounds and single-parent families where the parent was lacking in positive child-rearing skills (p 57). Parents of child firesetters were also less likely to be involved with the child's education or to engage in positive learning interactions with the child.

Wood 1995; Lewis 1999

A review of juvenile firesetting by Wood (1995, cited in Lewis 1999: 15) suggested that it is better to consider this activity as juvenile fire involvement rather than juvenile arson. This approach reflects the widespread interest with fire and involvement in fireplay among children, with most children not progressing to problematic firesetting. Wood suggested there are four kinds of juvenile fire involvement:

- fireplay – indicating a curiosity or exploratory behaviour;
- firesetting – a deliberate attempt to damage or destroy property; this activity indicates a comprehension of fire and its effects;
- pathological firesetting – the deliberate use of fire to express anger or revenge; and
- arson – involving an unlawful act of intentionally or recklessly setting fire to property, whether of another or one's own, for some improper reason.

Lewis argued that irrespective of the classification scheme adopted, the most common reason for deliberate fire-raising is 'simply boredom' (Lewis 1999: 16). He says that young people with much time but little to occupy them find piles of rubbish on street corners and other areas they frequent. The lighting of cigarettes by the young people leads to fire and ignition of the rubbish. The resulting fire and the excitement surrounding the arrival of the fire brigade creates something to occupy the young people for a time and leads to them repeating the offence (pp 16–17).

Other studies and reviews

An analysis conducted by the NSW Fire Brigades of fires caused by children between 1987 and 1994 (see Drabsch 2003: 13–14) suggested a very broad range of social and environmental factors common to children who light fires in Australia:

- single-parent home, child usually living with mother;
- either no father figure present, or continually changing males;
- recent trauma, such as moving home or school;
- recent new baby;
- lower socioeconomic profile;
- attention deficit disorder (ADD) and hyperactivity;
- enjoys experimentation and exploration;
- feels neglected, suffers poor self-esteem;
- poor communicator or parents are poor communicators;
- either extremely intelligent or slow learner;
- behavioural problems at school or home;
- difficulty in relating with peers;
- often prefers adult company;
- abused physically, sexually or mentally; and
- easily influenced by peers.

Drabsch notes that while these factors may be helpful identifying some children at risk of firesetting behaviour, focusing too much on individual factors may ignore the wider social factors that also contribute to arson (Drabsch 2003: 14). While helpful in some respects,

these factors are also clearly very broad in scope and cover a wide range of children who may be exhibiting problem behaviours, not necessarily firesetting. An analysis of most types of juvenile offending would produce a similar profile.

While many juvenile firesetters may come from single-parent families, the quality of parenting emerges as more important than the family structure itself. In an examination of over 1,000 child firesetters involved in intervention programs, Porth and Hughes (2000: 5) found no significant pattern in the relationship between the seriousness of a child's firesetting and whether they lived with one or both parents, whether either was a biological parent or not. Whether parents were divorced, married, unmarried or widowed similarly showed no significant pattern (Porth & Hughes 2000: 6). Together these results suggest that the structure of the parental relationship may not be important in relation to child firesetting. Rather it is the quality of the parenting that determines the firesetting outcome.

The National Association of State Fire Marshals in the United States in 2001 concluded there were five types of pathological juvenile firesetters (cited in Drabsch 2003: 14):

1. cry for help – many of these children had problems with depression, ADD and hyperactivity, together with stressful family situations; physical and sexual abuse and neglect were prevalent;
2. delinquent – usually 11 to 15 years of age; interest or involvement in vandalism and hate crimes, showing little conscience and a lack of empathy; firesetting was just one of a range of personality and behavioural problems;
3. severely disturbed – these were paranoid and psychotic individuals motivated by sensory reinforcement or self-harm; usually avoided hurting others with their firesetting;
4. cognitively impaired – also tended to avoid intentionally harming others; often caused significant property damage and displayed a lack of good judgement; and
5. sociocultural – firesetting was motivated by the supportive response these children would receive from the community or for attracting attention to a certain cause.

Among juvenile firesetters in the United States, a clear pattern has been shown in a young person's escalating firesetting and their involvement with peers. Young children are more likely to light fires alone rather than in the company of other children (Porth & Hughes 2000: 11). As children age and become adolescents, the likelihood of them lighting fires in company increases, suggesting an increasing role for peer pressure during teenage years. At the same time though, a young person's tendency to light fires in company decreases with the seriousness of their firesetting. Across all ages, those whose firesetting is considered to be of 'extreme concern' are nearly twice as likely to operate alone as

those whose firesetting is of 'little concern'. This finding echoes that of Sapp et al. (1996) in relation to serial arsonists, who lit far more fires when acting alone than they did in company.

A review of studies examining firesetting by children by Lowenstein (2001, cited in Stanley 2002: 8) found a range of common problems among these children including mental illness, suicidal intentions, other criminal histories, histories of sexual assault and a history of family and upbringing problems. Other studies have shown high levels of personality disorders, post-traumatic stress disorder, conduct disorder and cruelty towards animals (Stanley 2002: 8). Stanley concludes that the extent of these problems is perhaps not surprising given that the samples for these subjects are typically drawn from children who have come to the notice of authorities for the severity of their firesetting behaviour or because they are exhibiting other behavioural problems.

Bringing the findings from these and other studies together, Stanley (p 8) concludes that research throughout the world consistently shows approximately 90 per cent of young firesetters are male, while Australian research has shown that the age of first firesetting ranges from one to 14 years, with the average age being 5.3 years (p 8).

Stanley further concludes that young people who light fires often light multiple fires, with young firesetters in one Australian study lighting an average of just over seven fires in a given 12-month period. In considering why children and adolescents engage in problematic firesetting, Stanley (p 8) noted that the combined results of all studies suggested motivations including the need to:

- express intense personal feelings such as anger and hatred;
- attract adult attention to feelings of loneliness, distress and unhappiness;
- exhibit a cry for help; and
- be seen as important, valuable and heroic by apparently discovering the fire or helping to put it out.

Closer examination of these motives and the circumstances of young firesetters shows they have very similar backgrounds to those who exhibit other kinds of problem behaviours. These children typically come from backgrounds characterised by parental absence, family breakdown and conflict, parental psychopathology, erratic parenting styles and techniques, and low levels of parental involvement with the children (p 9). A number of studies have shown that many child firesetters have suffered physical and sexual abuse and that the effects of this can persist into adulthood, with nearly half of adult female firesetters shown to have a history of sexual abuse (p 9).

As is the case with adult firesetting, there are limits to how useful any classification schemes or summaries of motives for child firesetting can be. Bahr (1997: 3) has warned against trying to understand the behaviour of individual children involved in firesetting based on findings from statistical analyses of entire groups. While particular characteristics may describe a group, they do not necessarily describe any given individual within the group. Bahr suggests, for instance, that studies showing that some 60 per cent of child firesetters come from 'broken homes' thereby suggest that 40 per cent do not. He further notes that while a particular study of child firesetters found that 60 per cent had below average intelligence, a different study found little support in the literature for the conclusion that firesetting children differ from others in intellectual test performance.

Part 2: Bushfire arson

4 The impact of bushfire arson

Bushfires are a continuing feature of life in Australia, particularly during the summer months. Uncontrolled fires can cause devastation on a massive scale. In order to put the information gained from an examination of general arson literature into context, and applying it to an understanding of bushfire arson, it will be useful to provide some basic background information on the extent and impact of bushfires and wildfires. This background will help inform an understanding of the nature and seriousness of the bushfire arson problem.

How many bushfires?

Overseas

The United States has some environmental conditions that are similar to those in Australia and experiences large numbers of wildfires each year. During the period from 1960 to 2003, the US experienced more than 5.8 million wildfires, at an average of 132,444 fires per year (National Interagency Fire Center 2003). The number of fires per year ranged widely, from 81,043 in 1998 to 249,370 in 1981. The total area burned by these fires ranged from 1.8 million to 8.4 million acres, with around 4 million being typical for any one year.

The United Kingdom does not have the kind of fire-prone environments found in Australia and the US. There are nonetheless a sizeable number of grass and woodland fires annually in the UK, examples of incidence ranging from 175,000 fires during the dry summer of 1995 to 68,000 during the wet summer in 1997 (Lewis 1999: 69).

Australia

In Australia it is difficult to obtain consolidated data on the number of bushfires occurring over any given period. Some information on 'disaster level' bushfires is given below, but this excludes smaller fires. An appreciation of the extent to which Australia is subject to bushfire can be obtained by reviewing some available state and territory figures.

The NSW Rural Fire Service (NSWRFS 2004) reported the 2002–03 fire season as one of the most protracted and demanding on record, due to prevailing drought and weather conditions. During that period the service fought fires for nine months continuously, including 151 consecutive days on which a 'bushfire emergency' was declared. It recorded some 2,586 notifiable incidents and expended over 100,000 firefighter days.

Fires in NSW during 2002–03 were mostly in inaccessible terrain and burned around 1.5 million hectares (NSWRFS 2004). However, there was also an impact on urban areas, with 84 homes in NSW (mostly in the suburbs of Sydney) being destroyed. The service also noted that fires burned just over one million hectares in Victoria and 156,000 hectares in the ACT.

The NSW Fire Brigades responded to 38,851 fires in 2001–02, of which 37 per cent (or 14,375 fires) were vegetation fires (NSWFB 2003: 1). While these may include fires in urban parks, domestic gardens and other 'non-bush' environments, it is another indication of the flammability of the Australian landscape. A 10-year review of NSWFB activities showed that in both 1989–90 and 1998–99 the predominant fire attended was vegetation fires, though vegetation fires as a proportion of all fires fell from 39 per cent to 26 per cent across those years (NSWFB 2003: 133).

Between July 1995 and June 2003 the National Parks and Wildlife Service suppressed over 3,000 fires in NSW national parks and adjoining areas (NSW NPWS 2003). The incidence of bushfires has increased in recent years due to *El Niño* weather conditions which produce drought conditions and resulted in nearly 800 of these fires burning in the summers of 2001–02 and 2002–03.

During a 20-year period from 1976 to 1995 there were 11,676 fires on public land in Victoria, equating to an average of 584 each year (Davies 1997: 5). However, there was considerable annual variation, with the number of fires each year ranging between 243 and 878. In total, these fires burned over 2.3 million hectares of public land. The degree of variation in fire size and intensity from one year to another is indicated by the very broad range of area burned each year, ranging from a low of 4,817 hectares in 1992–93 to over 700,000 hectares 10 years earlier (Davies 1997: 5).

In 2002–03, the Fire and Emergency Services Authority of Western Australia suppressed 10,859 bushfires (FESA 2003). In the same year the Tasmania Fire Service attended more than 2,700 fires (State Fire Commission of Tasmania 2003: 8). While prevailing weather conditions may have made 2002–03 a particularly bad fire year across Australia, these figures give an indication of the frequency with which bushfires burn in Australia.

What causes bushfires?

It is perhaps self-evident, yet worth stating, that every fire has a cause and for many bushfires that cause is linked to a human agent (Weber 1999: 39). The cause of all bushfires can be divided into two categories – accidental and deliberate (Weber 1999: 39–40):

1. accidental:
    - natural:
        - lightning strikes;
        - spontaneous combustion;
        - glass;

- negligence:
  - vehicles and/or trains;
  - non-stationary engines;
  - stationary engines;
  - welding, grinding, soldering or gas cutting implements;
  - fuel spill fires;
  - powerlines;
  - escape from campfires;
  - cigarettes;

2. deliberate – factors to look for include:
   - incendiary devices;
   - close proximity to roads, tracks, trails, urban areas;
   - numerous fires close together;
   - evidence of human activity;
   - previous fires in the same location;
   - method of ignition cannot be determined and all accidental causes have been eliminated;
   - evidence from eyewitnesses;
   - apparent motive.

Of all natural causes, lightning strikes are by far the most prevalent. Glass fragments focusing rays of sunlight and discarded cigarettes can cause fires, but are very unlikely sources of accidental ignition (Weber 1999: 40). Spontaneous combustion occurs sometimes through the self-heating of organic matter such as coal, hay, sugar cane residue and even flood debris.

Statistics available for NSW and ACT bushfires indicate that natural causes account for only a small proportion of fires. In the ACT, lightning accounts for only three to five per cent of fires each year, an average of one fire each year is due to spontaneous combustion, and people are responsible for over 90 per cent of fires (Weber 1999: 41). In NSW, during 2002–03 lightning was responsible for 52 per cent of fires, with suspected arson the cause of 22 per cent (NSW NPWS 2003). It is interesting to compare this situation to fires that occur in the coniferous forests of British Columbia, Canada, and the western United States, where up to 60 per cent of forest fires are caused by lightning. In the Northern American boreal forests, lightning causes up to 90 per cent of ignitions (Weber 1999: 44).

The number of bushfires caused by lightning strikes varies considerably through locations and times. Through Victoria and the NSW alpine areas, some 25 to 35 per cent of fires are started by lightning, and 60 to 100 lightning-started fires can occur in one event (House of Representatives Select Committee 2003: 413). On 8 January 2003 lightning strikes started 87 fires in Victoria and 60 in the Kosciuszko National Park (in NSW), eventually resulting in a devastating firestorm that hit Canberra on 18 January of that year (House of Representatives Select Committee 2003).

While a large number of fires in Victoria result from lightning strikes, the majority are the result of human actions, either careless or malicious (Kapardis, Rawson & Antonopoulos 1983: 245). During the 10-year period from 1972–73 to 1981–82, nearly 60 per cent of Victorian forest fires were attributed to careless use of fire, and these accounted for approximately 30 per cent of the total forest area burned in this period. Malicious use of fire was responsible for approximately 18 per cent of the fires and 11 per cent of the burned area, but the number of deliberately lit fires has been increasing across a 20-year period (Kapardis, Rawson & Antonopoulos 1983). Lighting strikes caused 24 per cent of the total number of fires but 60 per cent of the area burned (Kapardis, Rawson & Antonopoulos 1983). At least in Victoria, damage caused by lightning fires is disproportionately large compared to their number, perhaps because they are more likely than human-caused fires to start in remote areas where they are inaccessible to fire suppression efforts and where the need to control them is not as great as in more urbanised locations.

What proportion of bushfires is deliberately lit?

Overseas

The US experiences an average of more than 100,000 wildfires every year. Around 90 per cent of these are considered due to human activities, mostly carelessness (Verrengia 2003). Some 23,000 wildfires a year in the US are thought to be the result of arson (Verrengia 2003). An analysis conducted by the US National Fire Protection Association found that 23 per cent of 115,000 fires in grass, brush and wildlands in 1986 were incendiary or suspicious (Hall 1998: 63). Another analysis estimated that approximately 22 per cent of all wildland fires in the United States are deliberately lit (Federal Emergency Management Agency 1994: 20).

In Southern California around 85 per cent of fires are caused by human activity, with 21 per cent being deliberately lit (Mees 1991: 97). An estimated 20 of 26 fires that destroyed large areas of Southern California and left thousands homeless in 1993 were considered to have been set by arsonists (Van Biema 1993: 36). The South Carolina Forestry Commission attends to between 5,000 and 6,000 fires per year, of which 40 to 45 per cent

are determined as deliberately set (South Carolina Forestry Commission 1994). In the UK it is thought that some 20 per cent of fires in open countryside are started deliberately (Lewis 1999: 69).

Australia

In the brief discussion above about causes of bushfires, a number of sources were cited which suggest that anywhere up to 90 per cent of bushfires are deliberately lit. A lack of consolidated national data makes this hard to confirm. In response to a question on notice in the Australian House of Representatives, which asked whether it was a fact that 70 per cent of bushfires are the result of arson, Dr Brendan Nelson, Minister for Education, Science and Training stated that the Department of Education, Science and Training did not have any statistical information on bushfires arising from arson (Hansard 2003). In response to the same question, Wilson Tuckey, Minister for Regional Services, Territories and Local Government was also unable to advise whether the suggested rate was correct, stating that while a significant proportion of bushfires are suspected to be due to arson, there is no consistent national approach to the collection and analysis of bushfire data (Hansard 2003).

The rate of bushfire arson seems to vary at different places at different times. Some environmental factors that may influence this are discussed later, but it is interesting to note it has been estimated that 40 per cent of the fires that burned around Sydney after Christmas 2001 were deliberately lit (Stanley 2002: 7). By 8 January 2002, 25 people had been arrested in connection with deliberately lighting fires, including 19 adolescents and children (Stanley 2002).

During 1996–97 the Department of Conservation and Land Management in Western Australia attended 293 wildfires, of which 85 were established as deliberately lit, with 67 of undetermined origin (WA Arson Task Force 1999: 6). In the following year, this increased to 470 fires, with 174 determined to be deliberate and 102 unresolved. While overall figures relating to losses and costs are not available, it is noted that one individual fire in the Gnangara Pine Plantation in 1995–96 cost $5.5 million in fire fighting costs and lost plantation assets (WA Arson Task Force 1999).

Overall, the WA Arson Task Force has reported that around 50 per cent of all fires attended by that state's fire services are deliberately lit (WA Arson Task Force 1999: 9). It further estimates that from 1995–96 to 1997–98, around 65 per cent of deliberately lit fires were set in grass, scrub and urban bushland areas.

In the five years to 2000, between 25 and 35 per cent of wildfires occurring in or adjacent to national parks and state forests in Victoria were recorded as deliberately lit, with similar figures in Western Australia (Crowe 1999: 45). However there is considerable local variance

in rates of deliberate ignition, with some regions in Victoria recording 60 per cent of fires as deliberately lit, and other regions recording as little as five per cent (Crowe 1999). At certain times and in certain locations this can significantly increase. In one year the percentage of deliberately lit fires in the Shoalhaven area of New South Wales reached 82 per cent (Crowe 1999).

During the 20-year period from 1976–77 to 1995–96, some 2,499 fires (21%) on Victorian public land were assessed as deliberately lit (Davies 1997: 6). The only more prevalent cause was lightning strikes, which accounted for 3,024 fires (26%). The relative prevalence of fire causes was highly variable across different regions of the state, with deliberate lighting causing 12 per cent of fires in the north-east region but 39 per cent in the Port Phillip region (Davies 1997). Deliberately lit fires accounted for more than 80 per cent of the area burned in the Port Phillip region, but only six per cent in the north east (Davies 1997: 19). While further and closer analysis of the data would be needed to properly analyse the implications of this variation, it does suggest the perhaps expected conclusion that bushfire arson is far more prevalent in more urbanised areas.

Ultimately, it is difficult to say with any certainty what proportion of fires are deliberately lit. The nature of fire behaviour and investigation, particularly outdoors, is such that there may be no firm evidence to confirm or deny whether a fire was deliberate, accidental or natural. In the case of bushfires, firefighters and investigators will often develop a suspicion that a fire was deliberately lit through the absence of any other feasible explanation, such as knowledge of lightning strikes occurring in the area. Whether that suspicion is able to give rise to proof of deliberate ignition supported by evidence, though, is another issue. As Drabsch (2003: 8) has noted, the relative isolation and concealment offered by the bush works to the advantage of bushfire arsonists, who are typically only apprehended if there is a witness who saw the fire being lit or saw the person leaving the area. In other cases circumstantial evidence, such as a person reporting or being at the scene of numerous fires, perhaps in far-flung locations, may provide evidence to support as assessment of deliberate ignition and possibly prosecution. The uncertain nature of these determinations means that any conclusions regarding the incidence of deliberately lit fires must be partly speculative and therefore an estimate.

According to Crowe (1999: 46–47), there is an attitude among many rural fire services that small bushfires are of little consequence, and fire crews can be dismissive of the need to determine the origin and cause of small fires. This may be understandable due to the number of small fires they may attend and the fact that they have not caused damage other than to scrub or bushland which will regrow. Indeed, the fire crews may see these small fires as beneficial as they assist regeneration and help to reduce fuel loads. At the same time, Crowe argues that these small fires may be the ‘breeding grounds’ for future arsonists and failure to investigate these fires may mean the motivations for lighting them go unrecognised.

Is bushfire arson on the increase?

As with arson activity overall, there are a number of sources which suggest the rate of bushfire arson may be increasing. In NSW, an observed increase in overall rates of incendiary and suspicious fires was seen in relation to tree, bush and grass fires which increased by 883 per cent, from 455 in 1987 to 4,475 in 1993 (NSWFB 1994: 8). During the same period the number of tree, bush and grass fires from all causes increased by 32 per cent. Incendiary and suspicious fires as a proportion of all tree, bush and grass fires increased from 13 per cent in 1987 to 34 per cent in 1993, with the rate per 100,000 people increasing from 55.9 to 167.3 in the same period (NSWFB 1994: 8). Breaking this down further, incendiary fires increased by 289 per cent, while suspicious fires increased by 189 per cent.

As noted for other types of fire, apparent increases in the rate of bushfire arson may be attributable at least in part to improvements in reporting rates and improvements in the ability of police to investigate the offences (ABC 2003b). It is not clear whether the incidence of arson is increasing, or whether the greater attention paid to it by fire and police agencies is simply revealing the extent to which the problem always existed (Abru 2001: 32). Community awareness of bushfire arson has led to greater vigilance and to the community playing a significant role in the detection and apprehension of offenders (ABC 2003b).

Not all available data indicate an increase in arson rates. Separating the 20-year data from Victorian public land fires into separate decades shows an increase in deliberate lighting of around seven per cent in the latter decade (Davies 1997: 9). This increase disappears, however, when the data for the last five years of the sample are broken down into separate years—there is a small and essentially consistent decline in incidence across these years. Further analysis would be required to assess the true nature of this decrease and whether or not it is just a short-term aberration within a longer-term overall increase.

What impacts do bushfires have?

It could be argued that, in one sense, deliberately starting bushfires is an act of little consequence. Damage to vegetation that does not impact on human habitations, threaten lives or cause commercially-significant damage (such as to forestry plantations) could be seen as of little importance. The procreation of many Australian flora species is reliant on or aided by fire (see MCCOC 2001: 51). At the same time, though, deliberately starting a bushfire creates a risk of damage to property, life and the environment that may reach catastrophic proportions (MCCOC 2001: 51).

There is no doubt that bushfires and wildfires can cause widespread devastation. Particularly where fires impact on urban–bush interface areas, they can cause death and injury as well as property damage on a massive scale. For instance, a severe brushland

fire in Oakland, California in 1991 caused the deaths of 25 people and damage estimated at $1.5 billion.

As discussed below, there is evidence to suggest that many arsonists may go to some efforts in selecting the most appropriate location and materials to start a fire. Those starting bushfires with the intention of having them spread rapidly may apply a degree of skill and knowledge in selecting appropriate weather conditions and finding a location whose aspect, slope and vegetation is conducive to the rapid spread of the fire.

A relatively small fire, whether burning in a building or in the bush, can quickly become a large one if not quickly controlled and the final amount of damage and the danger the fire poses to property and life is to some extent a matter of chance (Drabsch 2003: 8). This may be particularly so in the case of bushfires. While structural fires may tend to be confined to essentially one building or within a limited area, depending on the nature and contents of the structure, bushfires have the potential to spread across very large areas. Once started they quickly leave the control of the firesetter and may quickly leave the control of firefighters, particularly if weather conditions are severe and a number of fires come together.

The major fires of recent years and decades have shown how quickly circumstances can change in fighting large bushfires and how quickly properties can come under threat. Large bushfires seem in many ways to develop a life of their own as the fire creates its own environmental conditions. They present a continuing threat to the lives of firefighters and the public as well as livestock and wild animals. Once a deliberately lit blaze is underway and starting to spread, the person who lit it essentially relinquishes any control of the outcome of their actions. Particularly in urban interface areas, a firesetter can release the potential for the loss of multiple human lives and millions of dollars worth of damage. There are few human behaviours, outside terrorist attacks, which achieve this unfettered potential.

Cost of bushfires

The Australian government's Bureau of Transport Economics (BTE) analysed the costs associated with natural disasters occurring in Australia between 1967 and 1999 (BTE 2001). Based on insurance company definitions of a 'disaster', the BTE report only considered bushfires and other disasters where the total insurance cost of the event was more than $10 million.

Each year 'disaster-level' bushfires cost Australia an average of $77 million, though this can vary significantly from one year to another (BTE 2001: 44–46). Between 1967 and 1999 Australia was affected by 23 bushfires where the insurance cost was greater than $10 million. The total cost of these bushfires is estimated to have been more than

$2.5 billion, though the BTE report notes it is not clear whether this amount includes damage to forestry. The value of forest resources can be a significant component of bushfire damage. Following the January 2003 bushfires in the ACT, which caused some $300 million damage, the ACT government received an insurance payout of $52 million for the loss of much of the ACT's forest industry (SMH 2004).

It is often considered impossible to place a financial value on loss of life, and there is certainly no way to place a value on the emotions surrounding a death or serious injury. Taking into account a wide range of factors, however, the BTE report estimated the financial cost of a life to be $1.3 million when the fatality resulted from natural disaster, while a serious injury cost $317,000 and a minor injury $10,600 (BTE 2001: 47). Between 1967 and 1999, bushfires in Australia resulted in 223 deaths and 4,185 injuries, constituting a total cost of $654 million (BTE 2001: 52). It is noteworthy that while the total insurance and other costs from bushfires were less than from floods, severe storms, tropical cyclones or earthquakes during the period of analysis, bushfires claimed more lives than any of these other disasters (BTE 2001: 52). More people were injured by bushfires than all the other disasters combined and bushfires created 48 per cent of the total death and injury costs from natural disasters in Australia (BTE 2001).

Much of the damage caused by wildfires is difficult to place a financial cost on, as it is not confined to buildings, vehicles and livestock, all of which have a fixed dollar value. The cost of the devastating bushfires through NSW at the end of 2001 and early 2002 was estimated at $100 million (Drabsch 2003: 3). Although this figure is somewhat elevated due to the severity of the fires, and can only be considered as an indication of all fires, it must be remembered that the *social* cost of arson is thought to be possibly four times the more directly assessable cost (Drabsch 2003). This additional cost arises through the need to develop and maintain infrastructure in the form of police, fire brigades, courts and social services as well as through costs such as higher insurance premiums and increased construction costs in designing and fitting out fire-resistant buildings (Drabsch 2003). Fires can also disrupt social and economic activities and this may be particularly true for bushfires that spread over a large area, sometimes destroying infrastructure and properties as well as creating potential health hazards through the effects of smoke entering urban areas.

Due to the diversity of Australia's climate and landscape, and the way in which some very large individual bushfires can influence total costs, it is useful to consider some of the major bushfire impacts across the various states and territories. BTE figures show that between 1967 and 1996, 42 per cent of the average annual cost of bushfires accrued in Victoria (BTE 2001: 35). Twenty-two per cent of average annual bushfire costs accrued in NSW, 15 per cent in South Australia, 14 per cent in Tasmania and six per cent in Western Australia (BTE 2001). These figures are somewhat skewed by a relatively small number of particularly devastating fires, and were published before the January 2003 fires in the

ACT. The BTE figures show zero average annual cost for bushfires in the ACT or Northern Territory and belie the very large number of fires that burn in the Northern Territory without impacting on lives or property.

While Victoria only occupies a small percentage of the total Australian land mass, and experiences only a small proportion of the total number of bushfires that burn each year, the state's climate and landscape make it disproportionately vulnerable to the effects of bushfire. Since 1926 more than 250 people have been killed by bushfires in Victoria (Kapardis, Rawson & Antonopoulos 1983: 244). Major events have included the 1939 Black Friday bushfires which burned almost two million hectares, claimed 71 lives, burned 1,000 homes and cost $350 million (in 1998 dollars; DSE 2004, BTE 2001: 46).

In 1983, a combination of weather, fuel and ignition factors that developed on one day led to the Ash Wednesday fires in Victoria and South Australia (Trevitt & Ryan 1995b). Seventy five people lost their lives in those fires, 2,545 buildings were destroyed and over 390,000 hectares of country were affected.

In January 1994 almost all of coastal New South Wales experienced an extended period of extreme fire weather (Trevitt & Ryan 1995a). Between 27 December 1993 and 16 January 1994, 800 fires started, burning approximately 800,000 hectares. Over 200 houses were destroyed, mostly in urban areas of Sydney, while many others were severely damaged. Four people, including two firefighters, were killed.

During the Christmas period in 2001 more than 450 bushfires burned throughout New South Wales. Responding to these fires required 1,695 fire fighting equipment units, 109 aircraft and more than 29,000 personnel from 50 organisations (Drabsch 2003: 3). Despite these efforts 754,000 hectares of bushland were burned, 7,000 head of livestock were killed and 109 homes were destroyed. No human lives were lost, although an uncountable number of non-livestock animals doubtless perished. As has been mentioned, the financial cost of these fires was estimated at some $100 million (Drabsch 2003).

Fires in other parts of Australia have also been costly. The firestorm that hit suburbs in Canberra on 18 January 2003 destroyed more than 500 homes, took four lives and caused more than $300 million in damage (McLeod 2003: 1). The Western Australia Bushfire Service has estimated the annual value of property lost through fire incidents it responded to in 1996–97 was $9 million, while the value of fires suspected to be deliberately started was $3.8 million or 42 per cent of the total (WA Arson Task Force 1999: 6).

Psychological impacts

Another potential cost arising from bushfires, whether arson-induced or otherwise, is the psychological impact on firefighters. This psychological impact has been studied by McFarlane (1988) who examined the incidence of post-traumatic stress disorder (PTSD)

in 469 volunteer firefighters who had been involved in fighting the Ash Wednesday fires. These subjects were drawn from a community sample, rather than only from patients who presented for treatment, allowing subjects who had not developed PTSD to be used as a control group. Aside from the direct relevance to bushfire-related studies, the use of volunteer firefighters was interesting as, unlike most people in a disaster who try to protect themselves or escape from the disaster, firefighters must deliberately expose themselves to an extreme level of danger (McFarlane 1988: 116).

McFarlane found very different responses to traumatic circumstances among the firefighter group. Some had developed PTSD and experienced chronic distress and disability while others had been in situations of extreme danger without suffering any ongoing affects. Overall, and in contrast to other studies cited by McFarlane, the onset of PTSD in this group was not associated with a higher intensity of exposure to danger, greater losses or a perception of a greater degree of threat (McFarlane 1988: 119). Nonetheless the 11 subjects who developed PTSD experienced significant levels of difficulty, particularly from ongoing intrusive imagery and memories, avoidant thoughts and anxiety. These led to life and social problems, particularly in maintaining personal relationships. An interesting question, and one not explored by McFarlane, is to what extent the firefighters' expectation that they would be encountering danger and their awareness of the possible consequences of dealing with a fire disaster, helped mitigate against the more widespread development of post-traumatic difficulties.

Environmental impacts

On a very different note, given the significance of greenhouse gas emissions to the global environment and Australia's high level of emissions compared with other developed countries, it is pertinent to note that more than half of these emissions are produced by bushfires (Abru 2001: 32).

How much of these impacts are due to arson?

In considering the indirect costs of arson it must be remembered that not all fires, especially bushfires, spread and cause damage. At the same time, not all fires that do take lives, damage property or cause widespread destruction of bushland areas are due to arson. Natural and accidental causes inevitably cause a certain number of fires. Costs such as maintaining emergency services infrastructure, constructing homes in urban–bush interface areas with fire-resistant materials and providing fire safety equipment would have to be borne in any case. While it is possible that the extent of infrastructure and other costs may be reduced if all potential incidents of arson could somehow be prevented, further work is

needed to determine to what extent, if any, it would be possible to reduce costs in this way. Understanding how costs may be reduced if arson did not exist would allow us to determine how much arson is actually costing communities.

In many ways it is difficult to establish to what extent the damage resulting from bushfires is due to arson. It is too simplistic to say that because perhaps a quarter of bushfires are deliberately lit, a quarter of the damage caused by bushfires can be attributed to the work of firesetters. On the one hand arson-caused bushfires can sometimes cause relatively greater damage than those arising from natural causes. Deliberately lit fires are usually started relatively close to populated areas and are often started at times when other fires are already burning and causing problems for firefighters (Abru 2001: 32). Lightning-caused fires tend to burn across larger areas than many deliberately lit fires, largely because they typically start in remote areas which are inaccessible to fire crews and where the lack of population centres reduces the need to control them quickly. At the same time, these fires can spread rapidly into urban areas, as evidenced by the lightning-caused fires that began on 8 January 2003 and caused so much devastation in Canberra 10 days later.

To the extent that arsonists may select weather conditions and locations conducive to the spread of fire, arson-caused bushfires may be generally more severe than naturally occurring ones. The occurrence of deliberately lit fires during severe weather conditions, particularly when other fires are already burning, can present major problems for fire services and increase the likelihood than any given fire may become uncontrollable or that sufficient resources may not be available to deal with all fire fronts. At such times, even where an individual deliberately lit fire does not in itself become threatening, it may join up with other deliberately or naturally lit fires to become a major fire front.

A lingering difficulty is that unless it can be shown a given fire, or fires, was deliberately lit and caused damage in the absence of any naturally or accidentally lit fires in the same area at the same time, it is difficult to separate out and attribute costs to one fire type or the other. If a series of fires from different sources together cause injury or property loss it is not necessarily possible to attribute any particular component of the loss to the deliberately lit fire or fires. In the absence of more sophisticated models for apportioning costs, it may not be possible to do more than note the total costs of bushfires, and note the proportion that are deliberately lit and try to make logical inferences from one to the other.

5 Environmental factors in bushfire arson

Environmental factors contributing to bushfire arson

Australia is one of the most fire-prone countries on earth. The geographic location of Australia and its topography make almost all vegetation types in the country prone to fire, and many have evolved to utilise fire in their regeneration (Cheney 1995). The tropical rainforests of north Queensland may be the only 'fire-free' areas of vegetation in Australia (Cheney 1995).

The south-eastern corner of Australia, south of a line between Adelaide and Sydney, is particularly vulnerable to severe fire weather due to weather systems that can bring hot, dry air from the centre of the continent and very strong, dry winds from the Southern Ocean (Cheney 1995). These strong winds during dry times of the year tend not to occur elsewhere in the country. The south-eastern part of mainland Australia and Tasmania also produce tall forests with heavy fuel loads and have extensive and relatively densely populated urban areas that interface with the fire-prone bushland (Cheney 1995).

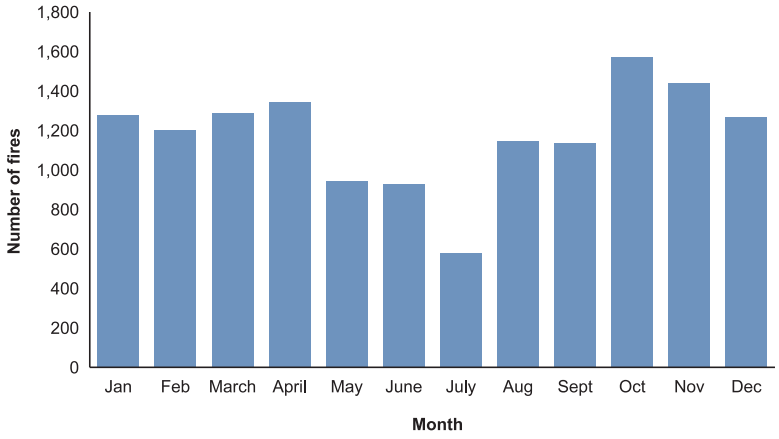
Under the right conditions fires in the Australian bush can grow very rapidly and quickly become uncontrollable. As an example, the Bendora fire in the Namadgi National Park, which contributed to the firestorm that destroyed 500 homes in Canberra on 18 January 2003, grew from around 100 square metres at 5pm on 8 January to 200,000 square metres by 11am the following day (Doherty 2004).

While Australia is prone to bushfires at all times, there are certain months of the year, and particular days and times, when bushfires may be more likely to be ignited naturally and also to grow and spread. If bushfire arsonists become more active at these times, the potential or actual effects of their fires become much greater.

Time of year

In northern Australia the main fire season is winter and spring, during the dry season, while in southern Australia fires burn most often and severely in summer and autumn (Cheney 1995). An analysis of fires attended by the NSW National Parks and Wildlife Service across a period of eight years showed that bushfires were most prevalent during September to December followed by a peak in January. There was a large fall in incidence from February to June (NSW NPWS 2003). An examination by the NSW Fire Brigades of fires between 1987 and 1993 found that incendiary and suspicious tree, bush and grass fires were most frequent in the summer months, peaking in October (NSWFB 1994: 9). There were quite marked differences between different months, with very few fires during winter.

Figure 1: Incendiary and suspicious tree, bush and grass fires in Australia, by month of the year, 1992–93



Source: King 1995: 69.

Expectedly, Australian fire incident figures show a peak of suspicious and incendiary bush and grass fire incidence during the summer months. As Figure 1 shows, in 1992–93 the number of fires was lowest during the winter months of May to July, then gradually increased to peak in October and November. It is interesting to note that after October and November there is a small drop in fires during December, January and February which are usually the hottest months and the periods when fire conditions are at their worst. Further analysis is needed to determine why this is the case.

Day and time of day

On a daily basis, the NSW Fire Brigades has found that incendiary and suspicious bushfires peak at 3pm (NSWFB 1994: 10–11). They are virtually non-existent between 4am and 6am, then gradually increase after 7am. Nearly 28 per cent of fires start between 3pm and 7pm, with the highest prevalence from 2pm to 6pm (NSWFB 1994: 10–11). The NSW data also show a significant increase in deliberate and suspicious bushfire ignition on weekends, with over 35 per cent of these bushfires occurring on Saturday and Sunday and the incidence spread fairly evenly across other days (NSWFB 1994: 12).

As shown in Figure 2, Australian fire incident statistics for 1992–93 show patterns in the incidence of incendiary and suspicious tree, bush and grass fires by day of the week and time of day (King 1995: 72). During those years the greatest proportion of this type of fire occurred on Saturday and Sunday. Fires were relatively uncommon during the middle of the week. There were virtually no fires of this type started in the early hours of the morning,

between 1am and 8am. After 8am there was a gradual increase in incidence with a clear peak between 3pm and 4pm and the hours either side of this. Incidence then declined again through the evening and night.

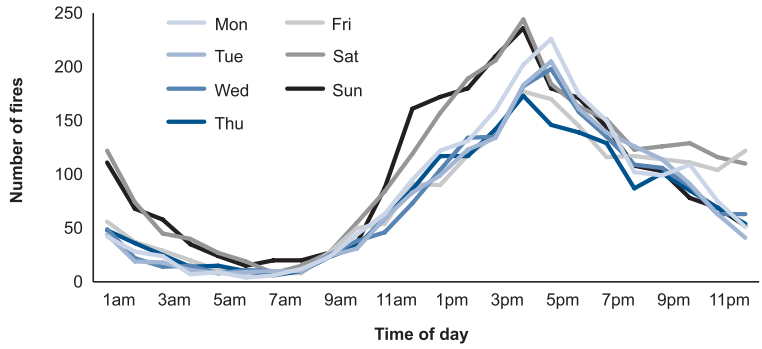
However, a study of over 1,000 child firesetters involved in juvenile intervention programs the United States showed no particular pattern in the time of the day or day of the week, when firesetting occurred (Porth & Hughes 2000: 8).

Severe fire weather

As noted above, south-eastern Australia tends to be prone to very severe fire weather which in recent years has been heightened by the prolonged drought resulting from the *El Niño* weather pattern. Severe fire behaviour typically occurs when there is a coincidence of factors conducive to the ignition and spread of fire, including:

- stressed and wilting vegetation;
- maximum fuel availability – lengthy period since areas were burned, curing of grass and shrub fuels and high availability of bark fuels;
- very high to extreme periods of fire behaviour; and
- prolonged summer dry spells that follow a dry winter and/or spring (House of Representatives Select Committee 2003: 409).

Figure 2: Incendiary and suspicious tree, bush and grass fires in Australia, by time of day, 1992–93



Source: King 1995: 72

During severe fire weather conditions there can be many large fires lit by arsonists, and arson is believed to be at least one of the primary causes of large wildland fires during severe weather conditions, if not the primary cause. During severe fire weather conditions fire authorities typically go on alert, partly through a belief that arsonists become more active in these conditions, and a belief that severe fire weather acts as a trigger for arsonists (Mees 1991: 97).

Mees examined weather conditions for 732 arson and 3,452 non-arson person-caused fires occurring in four Southern California forests during a 10-year period from 1975 to 1984 (Mees 1991). He found that, contrary to accepted beliefs, and the opinion of fire personnel, the proportion of arson and non-arson person-caused fires remained the same under most fire-danger conditions. His findings did not support a conclusion that arsonists become more active in severe fire weather. Mees did, however, find that arsonists were far more likely to cause large fires, with arson producing large fires at four times the rate of non-arson. This led Mees to the conclusion that arsonists probably target fuels and/or locations that will help the fires start and spread quickly. As Mees' fire weather data were based on seven-day averages, he could not rule out the possibility that arsonists were selecting high fire days or particularly dangerous periods within the seven-day cycle.

In Australia, there has also long been anecdotal evidence to suggest that bushfire arsonists may target ignition locations and times on the basis of a number of environmental factors. For instance, anecdotal evidence has suggested that bushfire arsonists may favour sites within close proximity to roads and that they do not often venture deep into the bush (McLean 2000: 11). It has also been thought that bushfire arsonists may look for topographical factors that aid the ignition and spread of the fire, such as the aspect and slope of the site, or wait for weather conditions that are conducive to creating large fires (McLean 2000: 12–13).

An attempt to provide a solid basis to the anecdotes and conjecture on these and other environmental determinants of bushfire arson activity was made in a study of fires occurring in the Dandenong Ranges of Victoria (McLean 2000). Using a geographic imaging system and information from fire investigators, McLean was able to map temporal and spatial characteristics of deliberately lit fires.

It was found that deliberately lit fires occurred predominantly in particular areas of the Dandenong Ranges. Seclusion from residents was highly important, with 36 per cent of all fires occurring within a narrow band of 150 to 200 metres from the nearest residence (McLean 2000: 24). Very few fires were lit within 150 metres of residences. During periods of total fire ban, the typical distance increased, with 24 per cent of fires being lit within 200 to 250 metres of residential areas and none less than 100 metres. It was found that the ability to access the site by road was important. Low quality roads – affording access to the firesetter but carrying little other traffic – were the strongly preferred choice of access

(McLean 2000: 26). Most bushfire arsonists chose to light fires within 50 metres of the road and there was a strong exponential decrease in ignition as distance from the road increased (McLean 2000: 28).

The analysis showed that fires were predominantly lit on aspects that promoted rapid fire development; extreme aspects that were north to north-west facing were preferred (McLean 2000: 30–31). A majority of fires were lit in areas where the slope of the land encouraged fire development. In contrast, fires that occurred naturally due to lightning strikes predominantly occurred in much lower risk sites (McLean 2000: 32–33). These findings suggest that people lighting bushfires often bring to the site a degree of knowledge about the aspects of the environment that will encourage fire spread. McLean could not confirm his speculation that community education and awareness campaigns had contributed to an increased level of knowledge among firesetters. He did find a pattern suggesting that over the previous five years firesetters had been selecting increasingly more dangerous sites, suggesting that levels of knowledge and understanding had increased greatly during that time (McLean 2000: 47).

When temporal patterns were analysed it was found that the number of deliberately lit fires increased through the warmer months, peaking in January (McLean 2000: 35). This is an expected result in that it is consistent both with other studies and with the pattern of naturally lit fires resulting from lightning strikes. When ignitions only by juveniles were considered these showed a significant peak of occurrence during October and November, with ignition decreasing markedly in December and January. On a daily basis, across the whole state of Victoria, fires tended to be lit constantly during the week with an increase on the weekends, although in the Dandenong Ranges it was found that ignitions tended to decline on the weekend (McLean 2000: 36). Juvenile fires, however, increased on Fridays and the weekend. No discernible difference was found between the times of the day when arson fires were lit, and when naturally lit fires occurred (McLean 2000: 53).

In the Dandenong Ranges, more fires were lit on total fire ban days than on other days (McLean 2000: 41). This tended to occur regardless of what the actual fire danger rating was on a given day. These findings suggest that the declaring of a total fire ban tends to encourage bushfire arsonists into activity and it is the declaration of a ban, rather than the actual weather conditions, that provides the trigger. The amount of deliberate firelighting does fluctuate with the fire weather intensity of different years (McLean 2000: 51). During bad fire years, possibly when there is more media coverage and greater potential for excitement or attention, bushfire arson tends to increase.

6 Why people burn the bush: motives and profiles in bushfire arson

It is apparent that most studies of arson have been developed in the UK and US, and focus on urban settings. Generalising from overseas studies to Australian populations and circumstances can be problematic. Conclusions derived from overseas studies must always be handled cautiously. There is always a question as to whether societal factors that have not been controlled for have influenced the results in ways that invalidate generalisation to other populations. The role of societal factors and culture may be particularly important in relation to bushfires. While the UK has forests, woodlands and other natural and rural environments, it does not possess bushland or wildlands of a scale or type comparable to those in Australia. The climatic conditions that typify a dangerous bushfire season in Australia – soaring temperatures, hot and dry winds, drought conditions that result in tinder-dry undergrowth – and a natural environment dominated by dry, sclerophyll forest and arid grasslands are simply unknown in the UK. It is not surprising, then, that most of the research in the UK has considered arson in urban areas, with only passing consideration given to fires lit in grasslands or open areas. Even where these environments are considered, they are likely to be thrown in together with, for instance, arson against empty buildings or farm buildings (Lewis 1999: 60).

Although some areas of the United States have conditions similar to Australia, and large wildfires are a major summertime threat, particularly on the west coast, it is apparent from the literature covered earlier in this report that US arson studies are also dominated by a focus on the urban environment.

One of the major confounding factors in generalising, even from US wildfire studies, is the particular place the bush occupies in the Australian psyche. In its broadest meaning, 'the bush' refers to the whole of rural Australia, essentially covering the entirety of the country that is not the major cities widely spread about the coastline. In this context the bush is an unassailable and intrinsic part of the Australian national identity. The notion of the bush, and the settlement of its far-flung reaches by early colonialists, establishes the foundation of a distinctively Australian culture expressed through literature, painting and music (Baker 2003: 27). The bush is said to 'form the national character and ethos of Australians' and is conceived as almost anthropomorphic as it 'embodies such virtues as mateship, stoicism, egalitarianism and a healthy disrespect for authority' (Baker 2003: 26). While Americans have the frontier and the Wild West to fire their imaginations, the imagination of Australians, and perhaps even the national conscience, finds its wellspring in the bush.

In its narrower meaning, 'the bush' refers to the sclerophyll forests that form a band from south-eastern Queensland around the coastline to the south of Western Australia. In this sense, the bush occupies a different, but similarly important, place in the minds of urban Australia. This is the bush which holds rich childhood memories for so many Australians. The bush is the scene of outings, picnics, camping trips and long summer days spent exploring and discovering. It has been the setting for many popular children's stories and television programs. The reduction of bushland areas close to major cities through urban

growth has perhaps deepened the sense of mystery and wonder with which many regard the bush and has contributing to making the urban–bush interface a highly attractive place to live for many Australians.

Most of the motives or behaviours forming the basis of the classification schemes and typologies in the literature simply do not arise in the case of bushfire arson or, where they do, they occur so infrequently or are so peripheral to the substantive offence, as to not even warrant significant consideration let alone recognition in a typological scheme. While there may be cases where a person lights a bushfire to conceal a crime, such as in the hope that a murder victim might be thought to have died from a naturally occurring bushfire, such cases will be rare.

Most of the classification schemes identify revenge as a primary motive for arson. The literature is replete with cases of aggrieved employees who respond to being sacked or to some other perceived injustice at the hands of an employer by setting fire to their workplace. There are many cases of jilted lovers who decide to get back at the object of their affection by burning their house or car. Given the nature of the damage and loss involved in bushfire arson, the likelihood of revenge-motivated ignitions occurring is much less, but nevertheless does occur.

Anger and revenge are usually directed at specific targets. When anger and revenge arise as motivations for bushfire-lighting, the anger seems mainly to be directed at society as a whole. This may be because the anger has been displaced from a specific person or organisation, or the person has feelings of resentment towards society overall which may be directed towards other targets in other circumstances (Shea 2002: 1). Kocsis has suggested there may be circumstances where a person burns down their own or a neighbour's house by starting the fire in adjoining bushland, on the basis of profit or revenge motives. At the same time Kocsis rejects the suggestion that bushfire arsonists are generally irrational or unstable, as a lot would not be suffering from a mental illness (ABC 2001). It is interesting to note in this context media reports that an 18-year-old jailed for four months in 1987 for starting a fire in the Blue Mountains said that he had been put under stress by workmates and took out his frustration by lighting a fire (SMH 2002b).

There will also be isolated cases of rural landholders igniting a neighbour's property or the bush adjoining it as 'payback' for some real or perceived wrong. There will be cases too of people who set fire to the bush as a form of protest against the practices or policies of government land managers or as revenge against some unfavourable government action or decision. Crowe (1999: 46) contends that this type of burning may result from a resentment towards the government, perhaps over a perceived indifference to the threats posed by bushfires or land management practices. To many rural firesetters, government land does not constitute property, and the low level of response made by fire agencies and police may endorse this attitude.

Arson committed for financial gain is central to most of the general arson classification schemes and forms the basis of a significant proportion of arson offences overall. It is possible that a small number of bushfires are lit by people whose primary intention is for the fire to take out insured buildings or vehicles so that fraudulent claims can be made on these losses. This might be done in the hope that the fire will appear to be an apparently naturally occurring bushfire. Alternatively, a bushfire may result from the fire spreading from the building or vehicle.

In some cases rural landholders will take advantage of favourable weather conditions and the existence of other bushfires in the area to light fires that will clear land which could not otherwise be cleared, either for legal or cost reasons. The opening up of additional grazing land through the effects of bushfire can accrue a financial advantage to rural landholders and as such their actions can be viewed as motivated by financial gain. The gain may, however, be relatively intangible or take time to accrue, and the offence is likely to be more opportunistic than calculated. It is difficult therefore to see the behaviour or its motivations as falling into the same category as those cases where a person has ignited a fire with the aim of collecting the proceeds from an overinsured building or to bring to an end a failing business venture. It is also most unlikely, and there is no known evidence to suggest, that there are professional 'torches' being paid to start bushfires, nor is it easy to conceive of a circumstance that would give rise to bushfire ignition as a professional venture.

The one apparent instance where direct financial gain is a motive for bushfire ignition is where the fire is lit by a firefighter who is paid a bonus when he or she attends a fire, or who can gain overtime by having to remain at a fire scene beyond the duration of a normal shift. In these circumstances there is the basis for an individual to light a fire for the sole or overriding purpose of accruing a tangible and direct financial benefit. It has been recommended that fire services avoid any policy of paying staff according to the number of fires they attend (Kocsis 2002: 5). Doley has suggested that firefighters may start fires for material gain or more altruistic reasons, such as trying to avoid the dissolution of their unit if they do not have enough activity (quoted in Moscaritolo 2004: 1). However, there is no evidence available to suggest that this activity by firefighters occurs to any significant extent or that where firefighters are choosing to light fires to increase their income they are choosing to light fires in remote bush areas rather than in urban areas.

As firesetting in a bush environment then rarely involves material gain or political ends, it has been concluded that bushfire arsonists usually act for psychological reasons (Shea 2002: 1). Many court reports of bushfire arson convictions include psychiatric diagnoses of antisocial personality disorder or histrionic personality disorder (SMH 2002a), the latter associated with attention-seeking and emotionality. In some cases bushfire arson may be sexually motivated (ABC 2001). However in most cases it is likely that adults who set bushfires do so for excitement or thrills, or the need for attention. The excitement or thrills

may be sought through the use of fire as an act of vandalism, possibly under peer pressure (Abru 2001: 33). Doley has noted arsonists' lack of remorse (quoted in Moscaritolo 2004: 1). She says that bushfire arsonists light fires for excitement – the excitement of the flames, the emergency services sirens and activity. Doley cites two broad categories: young men on the fringe of society who get excitement or a sense of purpose from their actions or, more rarely, firefighters.

It is apparent that the desire to gain recognition or hero status is a primary motive behind bushfire setting by volunteer firefighters. Media reports about a 20-year-old volunteer firefighter convicted of lighting 25 fires between January and December 2001 described him variously as:

- a loner;
- having good parents;
- liking action games and risk-taking;
- being quite intelligent;
- having pyromania;
- being immature, attention-seeking and a drifter;
- having been raised on a diet of action movies;
- having a longstanding desire to emulate the feats of firefighters which became a lust after watching TV images of firefighters rescuing people on September 11; and
- wanting the same accolades and recognition as the New York firefighters (Stanley 2002: 7).

It should be noted that it is not only volunteer firefighters who start bushfires in the hope of receiving attention and recognition. Other members of the community may also hope to be seen as heroes by 'detecting' and reporting fires, and possibly even becoming involved with assisting fire services.

In many cases bushfires, like urban fires, may be lit under the influence of a number of factors and motives operating together. For instance, the apparent tendency for arsonists to light bushfires at times when other major fires are burning or during fire bans can be considered in terms of a number of motivating factors. Generally, the times when fires are burning problematically are times when weather conditions are particularly severe and conducive to the ignition and spread of bushfires, thus prompting those firesetters who select the most appropriate fire conditions. For those craving excitement, the response of

fire services may be more rapid, on a large scale and is likely to be heightened by a sense of urgency which adds to the overall experience. The existence of other fires and community concern will increase the likelihood of extensive media coverage. This in turn will increase the potential for community recognition and the according of 'hero' status upon those for whom this is a motivating factor. Such conditions are also clearly ideal for those who light fires with the intention of causing the maximum amount of damage, whether this is for revenge or political purposes. For those who are seeking to use fires for a purpose such as clearing land, the existence of other fires makes it less likely that the deliberately lit fire will attract particular attention from investigators, particularly if the proximity of other fires makes it appear that the deliberately lit fire resulted from a cause such as spotting.

Children bushfire setters

It is apparent that in some cases bushfires will be started by children. A review of the literature on firesetting among children found no literature specifically addressing children's firesetting in an Australian bush context (Stanley 2002: 11). Stanley suggests that the research literature is therefore no more illuminating than the written popular media and this may be the reason that Australian writers have tended to depend to a large extent on newspaper accounts of bushfire arson behaviour.

In the absence of specific literature or further research on bushfire setting among children, it must be assumed for current purposes that children lighting fires in the bush do so for the same reasons as children lighting fires in other settings. This may be motiveless experimentation or play. It may also be motivated, for example, by a child who lights a fire in the bush as a 'cry for help' in response to family and other problems. The proximity of the bush to many urban environments in Australia, coupled with the flammability of native vegetation, particularly in severe fire weather, may provide a readily available platform for various forms of child firesetting.

A bushfire arson typology?

Given the relative lack of literature specifically addressing arson in bushland settings, it is not possible to present a fully comprehensive or empirically based classification scheme or typology of bushfire arsonists at this time. Further work with available data and with detected offenders will be necessary and is proposed as part of the current research program.

Nonetheless, sufficient information exists to allow a basic typology to be suggested. This is based on a consideration of motives as revealed through the general arson literature, and in particular those which do not seem to apply in bushland settings. It is also based on a consideration of the relatively limited literature addressing bushfire arson.

Drawing on all this material, the following typology of bushfire arson is suggested. The typology includes five principal types of deliberately lit bushfires, each with sub-categories.

1. Bushfires lit to create excitement or relieve boredom:
    - *Vandalism* – by individuals or groups. In some cases the firesetters may intend for the fire to spread across a large area, or may be reckless as to this possibility.
    - *Stimulation* – the firesetter seeks the excitement and stimulation of seeing fire crews, and possibly media arrive. May be further motivated by the existence of severe fire weather or other fires burning, making the response of fire crews more urgent and media coverage more likely. The firesetter will not usually intend to cause property damage, but may either be reckless as to the possibility or may feel that the potential for damage will heighten the experience.
    - *Activity* – fires lit by firefighters or others in order to generate activity and relieve the boredom or tension arising from waiting for a naturally occurring fire to break out. Firesetters are not seeking recognition or status, merely something to do.
2. Bushfires lit for recognition and attention:
    - *Heroism* – fires are lit to create the possibility that the firesetter will gain positive recognition and rewards and may gain 'hero' status by reporting the fire and perhaps assisting in the suppression effort.
    - Self-esteem/impress others – fires are lit in response to feelings of inadequacy. The firesetter seeks a feeling of power and control, and to demonstrate these qualities to others. Fires may also be lit to gain notoriety or reputation.
    - *Pleading* – fires are lit as a 'cry for help'. The firesetter seeks recognition and attention as a means of securing help or assistance, rather than for other rewards or hero status.
3. Bushfires lit for a specific purpose or gain:
    - *Anger* – fire is lit to secure revenge or as an expression of anger or protest, such as towards government land management agencies.
    - *Pragmatic* – fires are lit for purposes where other means of obtaining the objective are impractical or illegal, such as land clearing. Will also include relatively rare instances of crime concealment.
    - *Material* – fires are lit for material gain, such as by firefighters seeking overtime or other payments.

- *Altruistic* – the fire is lit to achieve an aim the firesetter believes will benefit others. This will include fires to gain recognition or funding for small rural fire services, or where the firesetter believes that the fire would clear fuel loads and prevent a more serious fire in the future.

4. Bushfires lit without motive:
    - *Psychiatric* – fires are lit on the basis of psychological or psychiatric impulses derived from mental disabilities. The firesetter does not have another motive and does not necessarily have control over his or her actions and lacks the capacity to form malicious intent.
    - *Children* – fires are lit as a form of play or experimentation but without any form of malicious intent or belief that the fire will spread.
5. Bushfires lit with mixed motives:
    - *Multiple* – fires are lit on the basis of several of the above motives arising at one time. Includes cases where the person suffers from a mental disability, but acts on the basis of other motives exclusive from or together with the effects of that disability.
    - *Incidental* – bushfires result from the spread of a fire that was lit with malicious intent, but without any expectation of a bushfire occurring. Includes cases where a person has set fire to a vehicle to claim insurance, as revenge or as vandalism and chooses to do so in a bush environment to avoid detection; the resulting fire spreads to the bush even though the firesetter never intended or foresaw that it would.

Part 3: Applying the knowledge

7 Firefighters: a special case?

Most studies investigating the motives behind arson offences have noted the occurrence of firesetting carried out by firefighters. The incidence of deliberate firesetting by firefighters is invariably portrayed in the literature as quite rare. Nonetheless, the fact that a certain number of fires are lit by the very people charged with putting them out, and those into whose hands the public entrusts their fire safety, is a topic warranting special consideration.

Do many firefighters start fires?

The incidence of firesetting among firefighters is not clearly known and there has been little direct research on the topic. Where firefighter arson has been reported in studies focusing on motives and classifications, the number of cases has been small. Much of the evidence for firefighter arson tends to be more anecdotal or conjectural. Many in the fire services may believe or suspect that some of their colleagues are lighting fires, but there is no firm basis for taking these suspicions to the level of accusation or more formal investigation.

The United States Fire Administration (USFA 2003: 5) has noted that while arson is reported in a number of major US data collections, it is not broken down to show the number of fires set by firefighters or other emergency services personnel. The USFA notes that such a collection would be difficult to maintain as it would have to be populated from the outcomes of judicial processes which could take years to complete.

There appears no doubt that the number of cases of firefighter arson is small, and only a very small proportion of firefighters 'cross the line' and light fires. The National Center for the Analysis of Violent Crime, located at the FBI Academy, was able to locate only 25 cases of firefighter arson across the United States for its study of firefighter arson (Huff 1994). These cases involved a total of 75 firefighters who were responsible for 182 fires.

In Australia, Strikeforce Tronto, set up by NSW Police to investigate the causes of bushfires in that state, investigated some 1,600 suspicious fires in its first three years of operation (Warne-Smith 2004: 3). Through those investigations 50 people were charged, 11 of them volunteer members of the NSW Rural Fire Service.

Perhaps the most important point to make about the incidence or frequency of arson committed by firefighters is that it is extremely rare when viewed against the number of firefighters who never commit arson. Of course, the 75 firefighters identified by the USFA as maliciously lighting fires is 75 too many. Nonetheless, this is but a tiny fraction of the over one million volunteer and paid firefighters operating in the United States (USFA 2003: 5).

The fact that 11 of the 50 people charged through Strikeforce Tronto were volunteer firefighters led to the rather misleading conclusion that one in five bushfire arsonists were volunteer firefighters (Warne-Smith 2004: 3). This conclusion ignores the large number of

people who lit fires without being charged and who were likely not firefighters. It also ignores the fact that those volunteers who were charged were not necessarily charged with firesetting, rather with other issues stemming from the investigation. Perhaps most importantly, the charging of the 11 volunteers needs to be considered in the context of the 69,000 other volunteers in the NSW Rural Fire Service who have not been implicated in firesetting (Warne-Smith 2004).

The importance of volunteer firefighters to the Australian community cannot be underestimated. Across Australia there are estimated to be at least 240,000 people performing volunteer services in the fire and emergency services sector (AFAC 2001: 5). Volunteers have been reported to provide an estimated 21 million hours of free service to the community each year, though this figure does not include the contributions of two of the three largest groups of volunteers in the sector, namely the NSW Rural Fire Service and Queensland Fire and Emergency Services (AFAC 2001: 6). With these services included, the total number of volunteer hours provided each year would likely approach 40 million. The financial contribution made to the Australian community and its economy by fire and emergency services volunteers is hard to calculate, but estimated to be around $1 billion every year (AFAC 2001: 1). No dollar value can be put on the lives saved by the work of fire and emergency services volunteers.

Impacts of firefighter arson

Taking into account the small number of firefighters who commit arson, and the vital community service provided by the vast majority of those in fire services, arson committed by firefighters nonetheless warrants attention over and above that committed by the general population for a range of reasons. Not least of these is the particular impact that firefighter arson can have.

Arson committed by firefighters can have the same devastating impacts as arson committed by non-firefighters, such as potential or actual death, injury and property damage. However, it is possible that in some cases a firefighter may be able to use his or her knowledge and experience to create a more 'successful' fire, which causes maximal damage. This may exacerbate the already high costs that arson accrues by way of increased insurance premiums and the cost of fire suppression measures, as well as increasing the possibility that the firefighter's colleagues could be injured or even killed battling the fire.

Arson committed by firefighters has other impacts beyond those caused by the actual fire, such as impacts on public trust and on the fire service. Firefighters are typically held in high esteem by the community, which relies on them to protect life and property in dangerous and difficult circumstances. It is important for the community's peace of mind to know that there is a committed and dedicated fire service available whenever it is

needed. The commission of arson by members of the fire service, particularly given the media interest that generally accompanies charging or conviction, can undermine public confidence (USFA 2003: 20). In some cases this could affect community support in very direct ways, such as funding of rural fire services. In other cases the fire service could suffer loss of morale or have their effectiveness compromised by the turmoil created by allegations and investigations. Damage to the fire service's reputation could also interfere with its ability to attract high-quality recruits.

Motives for firefighter arson

In its report on firefighter arsonists, the USFA (2003: 8) sets out the six motives that it sees predominating in the research, namely:

1. excitement-motivated arson;
2. vandalism-motivated arson;
3. revenge-motivated arson;
4. crime concealment-motivated arson;
5. profit-motivated arson; and
6. extremist-motivated arson.

The USFA also notes a seventh category of 'mixed motives'.

There are examples of firefighter arson in each of these categories (USFA 2003: 9) but the study by the National Center for the Analysis of Violent Crime (NCAVC) isolated excitement, revenge and profit from its small sample (Huff 1994). The USFA noted that vandalism-motivated arson would be found more frequently among civilians than firefighters (USFA 2003: 10). Significantly, the NCAVC study found firefighter arsonists tend to start with small, nuisance fires in rubbish or vegetation before gradually moving to larger fires with more potential for damage. These fires were usually in vehicles or unoccupied structures, but sometimes in occupied structures. The USFA (2003: 3) has noted that by setting fire to an occupied structure, a firefighter arsonist has a greater potential to gain hero status by helping to rescue the occupants.

Using the above typology, it would seem likely that the majority of firefighter arsonists would commit their offences through an excitement motivation. This would include those who want to stimulate some activity for their unit or brigade as well as those seeking attention, recognition and hero status. A smaller number would be aggrieved firefighters who feel they have been treated badly by their unit or community and start fires accordingly.

There will also be some who start fires for profit, such as those seeking overtime payments or those who are paid on a piece basis when they are called to fight fires. As noted above, this latter situation has led to calls for fire services to not offer payments on this basis (Kocsis 2002: 5).

There may be instances where a firefighter will set a fire in order to conceal some other crime. In the USFA report (2003: 10) there is an example of a firefighter who lit a fire in his house in an attempt to conceal the murder of his wife. In this situation, however, it would seem that the individual's status as a firefighter was probably incidental to his decision to murder his wife. It is possible that his decision to use fire to conceal the crime may have derived from his experience and knowledge of fire, but overall this offence can probably not reasonably be attributed to him being a firefighter. The same can be said of most cases where a firefighter lights a fire for extremist or political reasons, such as the example given in the USFA report (2003: 10) where some white males who happened to be firefighters burned down African-American congregated churches in the southern United States during the late 1990s.

Profiling firefighter arsonists

Two attempts have been made to establish profiles of those firefighters who commit arson, by the South Carolina Forestry Commission and the FBI's Behavior Analysis Unit (see USFA 2003: 7). No formal evaluations of the efficacy of the two profiles are known to exist, but they are reportedly considered by law enforcement officers to present a 'remarkably accurate' profile of most known cases (USFA 2003: 7). The profiles are presented in Table 5.

A number of features of the profiles are particularly worthy of note. First, the two profiles show distinct concordance across all dimensions. Second, the features identified are consistent with those that emerge in profiles of arsonists within the general population. Third, although these are based on US samples and must therefore be applied with some caution to the Australian setting, the fact that one of the profiles was developed by a forestry fire service increases the applicability of the profiles to Australian volunteer firefighters. The overall concordance between these samples and others increases this applicability.

Most researchers have found that firefighter arsonists generally use fairly unsophisticated methods for setting fires. They tend to use available materials, such as paper or clothes, together with gasoline and matches or cigarette lighters (USFA 2003: 8). Generally firefighter arsonists work alone, but instances of them working together as a group have also been found (Huff 1994; USFA 2003). Doley has concluded that firefighter arsonists are different from other arsonists (Doley 2003d). They are frequently of above-average

Table 5: Profiles of firefighter arsonists

South Carolina Forestry Commission	FBI's Behavior Analysis Unit
White male, age 17–26	White male, age 17–25
Product of disruptive, harsh or unstable rearing environment	One or both parents missing from home during childhood. If from intact home, the home atmosphere was mixed and unstable
Poor relationship with father, overprotective mother	Dysfunctional. One of the parents left the home before the child reached age 17. Cold, distant, hostile or aggressive relationship with natural father
If married, poor marital adjustment	Poor marital adjustment. If not married, still living at home with parents
Lacking in social and interpersonal skills	Lack of stable interpersonal relationships
Poor occupational adjustment, employed in low-paying jobs	Poor occupational adjustment. Menial labourer, skilled labourer, clerical jobs
Fascinated with the fire service and its trappings	Interested in fire service in the context that it provides an arena for excitement, not for the sake of public service
May be facing unusual stress (family, financial or legal problems)	Alcoholism, childhood hyperactivity, homosexuality, depression, borderline personality disorder, suicidal tendencies
Average to above-average intelligence but poor to fair academic performance in school	Mixed findings on intelligence, but most arsonists have been found to have average to higher intelligence. Poor academic performance

Source: USFA 2003

intelligence and appear to function successfully in society. They are usually employed, but may have high job turnover and appear as arrogant, cocky or overbearing to those close to them. Younger individuals may be overly eager to please or attention-seeking.

In relation to volunteer firefighters, it has been noted that while many members of a fire brigade would have an interest in fire, most have a healthy respect for the community they serve and do not engage in firesetting (Crowe 1999: 50). It is suggested that this interest and concern in itself can help identify fire service members who have the characteristics of an arsonist (Crowe 1999). Crowe argues that those members who appear overly interested in fire and overly keen to help the community may be potential firesetters.

The difficulty with this approach, however, is that these characteristics can be either negative or positive. An individual firefighter may have an obsessive interest in fire that leads to a need to start one if it does not happen to arise naturally. The same individual may have great concern for the wellbeing of his community which leads him to start fires in the hope that the ensuing attention leads to the community receiving government support, such as

funding to maintain the local fire brigade or for improved land management. Alternatively, an individual's interest and concern may lead to a keen awareness of the dangers of fire and a desire to reduce the impact of fire on the community. Focusing on interested and concerned individuals will not be of benefit without a close examination of the nature of these traits and the way in which the individual expresses them.

Preventing firefighter arson

Many fire services, particularly in the United States, have adopted measures to prevent arson committed by firefighters. This topic is discussed in the chapter on prevention, later in this report.

8 Responding to arson through management and treatment of the offenders

Adult arsonists

A review of the literature indicates that little regard has been given to the treatment of adult firesetters. For example, one review of recent research was unable to identify any significant literature on treatment for adults and noted that recidivist firesetters have reported disappointment over not receiving psychosocial and medial help, especially in comparison to once-only firesetters (Lowenstein 2003: 196).

This lack of attention suggests that treating arson may not be different in essence to treating other forms of offending behaviour. Where the arsonist's behaviour is attributable to an underlying psychological or psychiatric condition, this condition should be treated. Repo and Virkkunen (1997, cited in Lowenstein 2003: 196) for instance observed the high level of alcoholism and alcohol misuse among firesetters and suggested the need for related treatment. Scott considered the possibility of effectively treating psychotic firesetters on the basis of their disorders and saw a 'psychiatrically oriented prison' as the most suitable environment for isolation and treatment of what he called fire bugs. He did not, however, support the notion of a institution specifically oriented to dealing with firesetters as previously put forward by Lewis and Yarnell, preferring an institution which also dealt with other offenders with severe personality disorders (Scott 1974: 126–127).

Prins (1994) has suggested for those firesetters who do not have severe underlying mental disorders that treatment should centre on an investigation of social and personal circumstances with a view to ruling out other psycho-pathological factors. It is contended that therapy can be beneficial where an underlying condition is found. For political firesetters and vandals, though, Prins argues that general penal and other criminal sanctions are the best approach. The behaviour of these firesetters needs to be understood in the context of other forms of social violence and responded to with the sanctions applied to other violent offences.

Where a firesetter has been diagnosed with a mental disorder, the objective will be to treat the underlying illness, using medication and psychotherapeutic methods (Prins 1994: 68–69). Once the illness is stabilised in a psychiatric hospital, there is a strong need for the patient to receive adequate and appropriate support in the community, including through the application of supervision and controls where necessary and the provision of support for basic needs such as accommodation. Stabilising the illness and the patient's circumstances, Prins suggests, should prevent the distorted thinking that led to firesetting behaviour from again arising.

Bushfire arsonists

Given the dangers – actual and potential – posed by bushfire arson, it is perhaps not surprising that there have at times been popular calls for extreme measures to be taken in response to arsonists. For example, during the devastating fires that burned around Sydney after Christmas 2001, the popular media, especially talkback radio, was the source of archaic suggestions about how to deal with convicted arsonists, such as inflicting burns on them (Kocsis 2002: 4).

As with most instances where a particular crime captures public attention, there are often calls from the public, media and politicians for harsher penalties and longer gaol terms for convicted arsonists. Sometimes these calls result in the introduction of new or amended legislation allowing for these harsher sentences. The efficacy of tougher penalties in deterring arson, however, as with any other type of offending, is highly dubious. The deterrent effect is based on an assumption that the individual will stop and rationally consider their behaviour before deciding to embark or proceed on a particular course of conduct. As Kocsis has noted (2002: 5), many arsonists act from the basis of motives that do not incorporate the kind of contemplation that would allow more severe potential punishments to have a deterrent effect. Arsonists who suffer from intellectual disability or mental illness, or who are driven by the strength of feelings of vengeance, will not desist from their behaviour on the basis of a punishment they may not be able to comprehend.

The notion of establishing a register of convicted bushfire arsonists as a deterrent was rejected by Kocsis (2002: 5) with the observation that this already exists in the form of police and court records, and creates issues of stigmatisation, labelling and privacy concerns likely to override any benefit it may produce.

Child arsonists

Against the relative lack of literature on treatment of adult firesetters, there is quite a large literature on treatment for juveniles. The management of child firesetters is generally seen as a separate issue from the management of adults, with different needs being addressed. The literature generally reflects a belief that child firesetting, if addressed early enough, can be eliminated before it becomes an established behaviour or before it escalates into more dangerous and more malicious activity. Interventions to prevent and respond to firesetting in children and adolescents generally incorporate general education, specific education and specific treatment, or a combination of these.

General education

Given the extent of interest and fireplay among young children, it is very important that all children receive education about fire and its dangers. Kafry (1990: 57) suggests that intensive fire prevention efforts should be addressed at all preschool children and that educators and psychologists who deal with parents and their youngsters should be aware of fire prevention and include it as an integral part of their work. For young children, educational programs can be used to develop understanding and awareness about the dangers of fire. Involving children in helping to prevent fires at home, such as by emptying dirty ashtrays, can also be beneficial (Wooden & Berkey 1984: 182–183)

It has been suggested that the best approach to managing very young firesetters is a program of education aimed at helping them develop an understanding of the dangers of fire (Prins1994: 83–84). This approach recognises that many children will have an interest in fire and many will engage in fireplay without giving any consideration to the possible consequences of this type of play. Making the children aware of the dangers can help to prevent or limit the extent of their fireplay, or help ensure that they confine their fireplay to relatively safe circumstances. This awareness can also help ensure that children will take quick and appropriate action, such as alerting adults, if the fire gets out of hand.

Specific education

Where children have been involved in problematic fireplay or show an unusually keen interest in fire, there is a need for more specific education programs. Many fire services have introduced awareness courses to help child firesetters understand the wider context of fire and the dangers it can bring. Some of these programs aim to satisfy the child's interest and curiosity by directly exposing them to the work of fire services and their equipment. Children may visit a fire station and be shown or allowed to handle firefighting equipment as well as watching demonstrations or firefighting exercises. As will be seen in specific examples later, many English fire services have found this approach to be effective, as children come to understand the consequences of fire and those who deal with it on a realistic level. With older (eight- to 14-year-old) children, useful approaches to fire education may include writing essays on fire issues and administering fire prevention and safety tests (Wooden & Berkey 1984: 182).

Involving parents

In formulating education programs for children it is very important that the parents be involved as much as possible. Most studies of firesetting in children have identified troubled family backgrounds as the principal contributing factor, with a lack of parental supervision

and control as a major component. Programs for young firesetters need to try and generate a willingness in the parent or parents to become involved with addressing the problem and to work with the child and program-deliverers to overcome the problematic behaviour. A high level of awareness of fire hazards was found among the parents of eight-year-old boys (Kafry 1990: 50), with 68 per cent saying that the danger of fire is the main thing they wanted to teach their children about, and 44 per cent indicating that fire was their main fear when they left their children alone. At the same time, when asked how they handled their child's interest in fire, 38 per cent of mothers chose to deal with the problem by ignoring it or simply forbidding the child to use fire.

It is likely that many parents will not be cognizant of the dangers to life and property that a child's firesetting may bring and appropriately involving the parent in the child's education and treatment may help make the parent more vigilant and take a stronger interest in the child's overall behaviour. This in itself may be a trigger for a greater level of parental involvement in the child's activities generally, and may lead to recognition of the circumstances that are contributing to the child's feelings. It is even possible that successfully involving a parent in a fire treatment program may be the foundation for resolving those conflicts that have led to the firesetting behaviour in the first place.

Specific treatment and counselling

For older children, or those whose fireplay has become regular or problematic, there may be a need for therapeutic interventions beyond a general education program. This may involve the provision of individual counselling to address the firesetting behaviour and its underlying causes (see Prins1994: 83–84). The use of a single session of hypnosis combined with family therapy has been found to successfully terminate firesetting behaviour in some young people, with firesetting behaviour remaining absent at a two-year follow-up (Lowenstein 2003: 195).

Programs involving behaviour modification have proved successful with some child firesetters. Programs might involve encouraging the child to understand the motivations behind her or his firesetting behaviour so that the child is better prepared to cope with stressors (Wooden & Berkey 1984: 183). The child may then be rewarded for positive behaviour, such as responding more appropriately to those stressors. Programs may involve a satiation approach where a child is allowed, in a controlled setting, to play with fire until he or she becomes satiated by the experience and the interest in fire begins to wane (see Prins 1994: 83–84). For instance, a child may be required to continually light matches throughout an entire therapy session or sessions. After a time, the action of lighting matches will become boring and seeing the flame suddenly spring from the match will lose its magical wonder and appeal.

Some successful behaviour modification programs have also involved adversive components (see Prins 1994: 83–84). For example, the child lighting matches throughout a therapy session may be required to hold the match until the heat of the flame is felt on their fingertips and starts to become unpleasant. Alternatively, the child may have to hold each match at arm's length until the discomfort of fatigue sets in. While it is arguable whether treatments involving adversive components can be considered ethical, the inclusion of such a component can help change fire from a desirable and magical thing to something that is regarded as mildly unpleasant and generally to be avoided.

Muckley has expressed great confidence that firesetting behaviour can be resolved, citing success rates of more than 90 per cent from various programs (Muckley 1997: 33). It is believed the ability to resolve firesetting behaviour results from the fact that, compared to a successful robbery, the payoffs from firesetting are low and behaviour is maintained by the payoff. A number of treatment methods for young firesetters are suggested, including:

- setting up a 'fire helpline' to allow children and parents to talk after an upsetting situation, rather than the children starting a fire;
- counselling, being mindful of responding to peer pressure and providing ways of dealing with home problems;
- making use of peer tutoring, by introducing young people to previous problem firesetters who have responded to treatment;
- visits to fire stations, though these may reinforce or reward firesetting and should not be undertaken until firesetting behaviour has stopped;
- restitution by way of financial recompense or assistance with repairing and cleaning up damage; this works particularly well with disturbed teenagers who may be feeling guilt about their behaviour;
- developing a home escape plan with the firesetters and giving each family member a fire prevention task;
- teaching firesetters about safe lighting of matches; and
- following up treatment programs after one year.

While education and outpatient behaviour modification programs may be appropriate for younger children undertaking less serious firesetting, older more serious delinquents may have to be dealt with through programs delivered in correctional or hospital settings (Wooden & Berkey 1984: 190). A variety of approaches may be used including pharmacological treatment, psychotherapies, behaviour modification, problem-oriented treatment, social skills training, assertion training and anger management programs (Lowenstein 2003: 196; Vreeland & Levin 1990: 43; Wooden & Berkey 1984: 190).

Depending on the needs of the child and the techniques of the therapist, these programs may be conducted individually or on a group basis, or a combination of these.

The need to consider pharmacological treatments is indicated by the findings of a number of Finnish studies showing the possibility of a neurochemical component to firesetting behaviour. Studies by Virkkunen and others (cited in Lowenstein 2003: 196) have suggested that family history and paternal violence and alcoholism may reduce central serotonin levels in juvenile firesetters. Reduced serotonin levels have been linked to impulsive and aggressive behaviours including impulsive arson, impulsive acts of violence, argumentative and hostile behaviour, substance dependency, obsessive-compulsive behaviour and violent suicide (Bender 2003; Ranier 2002).

In any case of a child involved in problematic fireplay, showing an overly keen interest in fire or engaging in firesetting with a wilfully destructive component, it will be important to not only address the overt behaviour but to examine the problems underlying it. A UK study by Swaffer (1993, cited in Lowenstein 2003: 196) suggested that the diversity of motives among young firesetters implied that treatment needs would vary from one individual to another and interventions needed to be individually targeted. The same study suggested the need for a functional analysis of the youth and his or her family, peer relationships and emotional responses to daily life events.

Stanley has noted there is sufficient evidence to show that children who are severely abused and neglected are likely to engage in disturbed and problematic behaviours, and one of these behaviours may be lighting fires (Stanley 2002: 11). Understanding and responding to children's firesetting needs to be understood in the context of this history of abuse and the child's responses to it. Those working with children and young people engaged in problematic firesetting behaviour must be aware of the strong possibility of neglect and abuse having contributed to the behaviour and that the firesetting may be a direct response to this treatment. Within this context, appropriate counselling and other interventions can be applied to help resolve these root causes. At the same time, professionals working with children and young people who have abused backgrounds need to be aware of the possibility that firesetting may manifest as one response to this abuse and be ready to intervene appropriately, perhaps by liaising with fire service and other professionals.

Where a fire has been lit as a form of attention-seeking behaviour, it is necessary to consider whether this was as a 'cry for help' in response to a short-term crisis and whether the behaviour will cease once the crisis has passed, or whether the act is related to chronically low self-esteem, in which case a more ongoing supply of attention is required (Shea 2002: 2). Those seeking recognition and 'hero' status are likely to fall into the latter category. The question of whether the attention-seeking is acute or chronic will determine the nature and duration of the intervention required to respond to it.

Elements of effective juvenile firesetting treatment programs

As well as discussing specific approaches to juvenile firesetting, a number of writers have tried to set out those elements that combine to create effective juvenile firesetting programs. Kafry's (1990) conclusions on appropriate ways of responding to problematic fire behaviour in children are:

1. increase the availability of fire prevention training to more adults and future adults in our society;
2. develop guidance for parents and specialists who deal with young children;
3. train children in actual preventive behaviours in addition to teaching knowledge;
4. allow children constructive channels for expressing their interest in fire;
5. study the effects of existing preventive programs on actual fire behaviours including fire skills and fireplay;
6. compare the effects of the 'don't play with matches' theme with the 'use matches safely' theme in terms of fire knowledge, skills and play;
7. focus on fireplay rather than firesetting as the major variable for future research and prevention efforts;
8. channel the energy of the 'rascals' to other constructive directions not necessarily involving fire, but involving physical activity, exploratory plays, and development of hobbies;
9. direct intensive prevention efforts to children who are embedded in deprived family backgrounds;
10. study fire variables and the effectiveness of prevention approaches in different populations and social settings and relate them to the general context of socialisation research; and
11. study the effects of prevention programs on behavioural as well as cognitive indices.

The USFA and the Office of Juvenile Justice and Delinquency Prevention (OJJDP) examined the elements of effective juvenile firesetting intervention programs and identified seven critical components (see Schwartzman, Stambaugh & Kimball 1999: 18–19). These elements may be useful as the beginnings of a best practice approach to developing an intervention program:

1. a program management component to make key decisions, coordinate interagency efforts, and foster interagency support;

2. a screening and evaluation component to identify and evaluate children who have been involved in firesetting;
3. an intervention services component to provide primary prevention, early intervention, and/or treatment for juveniles, especially for those who have already set fires or shown an unusual interest in fire;
4. a referral component to link the program with the full range of community support agencies that might help identify juvenile firesetters and provide services to them and their families;
5. a publicity and outreach component to raise public awareness of the intervention program and encourage early identification of juvenile firesetters;
6. a monitoring component to track the program's identification referrals and treatment of juvenile firesetters; and
7. a juvenile justice system component to establish relationships with juvenile justice agencies that often handle juvenile firesetters.

Many English fire service programs involve specially trained firefighters in working with child firesetters, and firefighters may be uniquely suited to this type of role. Firefighters regularly deal with the victims of fires and experienced firefighters are often highly skilled in working with people and helping them in times of crisis. Also, firefighters are used to working in teams, so become good at networking with social service agencies and other professionals while retaining a practical and focused approach to dealing with the problem at hand (Smith 2001: 4).

As Porth (2001: 1) has noted, identifying and successfully involving community stakeholders can be the key to an effective intervention program. The commitment of stakeholders can provide avenues and human resources for addressing the various underlying problems and issues that may be contributing to firesetting behaviour, while also providing a basis for meeting a program's financial resource needs. Key stakeholders in firesetting intervention programs include (Porth 2001: 1–2):

- fire services, including fire investigation;
- law enforcement;
- mental health;
- juvenile justice;
- education;

- child welfare; and
- hospital and medical services (burns and paediatric).

Some cautionary notes

While fire service awareness programs have proven successful with many child firesetters, they are not without their dangers. Exposure to the services may satisfy the curiosity of many children and may allow them to direct an interest in fire into positive pursuits such as a future career in firefighting, but it may serve only to heighten interest in others. There is a danger that such approaches could reinforce a child's fascination with fire and drive him or her to become more involved with fire in a negative sense. For this reason it is vitally important that children undertaking these programs are monitored by a suitably qualified professional and that therapeutic interventions are made should the child's response not be appropriate. The dangers of misdirected interest also highlight the need for interventions to ensure that the underlying problems contributing to firesetting are addressed. If the underlying problems remain and the child is not equipped to deal with them, there is a lingering danger that firesetting behaviour will return or the child will find other inappropriate ways of expression.

There is also concern about the use of confrontational techniques in fire awareness programs. Some programs have advocated confronting child and adolescent firesetters with the possible ramifications of their behaviour. This might involve taking them to the scene of burned-out buildings, showing them images of burn victims or even having them visit the burns unit of hospitals or do volunteer work with burns victims. While this form of confrontation may make some young firesetters come to a sudden realisation of the potential consequences of their actions and inspire them to abandon firesetting, there is a danger that others will simply be traumatised by the experience. This may create further problems or exacerbate existing ones. It may leave some children feeling guilty and lead to further declines in self-esteem where this is a component of their underlying problems. In some cases it may even deepen feelings of anger or resentment towards society or those around them and lead to an exacerbation of firesetting behaviour. Where a firesetter acts on the basis of an antisocial personality disorder, or out of antisocial feelings of resentment towards society, exposing them to the consequences of their actions may be useless at best (Shea 2002: 2).

A cautionary note about assuming the efficacy of fire education programs for children comes from the work of Kafry. She notes that her study found no significant differences between children who played with matches and those who did not on any indices measuring knowledge about fire and its consequences (Kafry 1990: 50). By indicating a lack of correspondence between the cognitive and behavioural aspects of fire, Kafry suggests that increasing a child's knowledge and understanding about fire does not guarantee they

will reduce their involvement in fireplay and firesetting. Prevention efforts may need to be directed at limiting the ability of children to play with matches in the first place. As playing with matches is not an isolated problem, but rather one related to other problems in the child's life, addressing inappropriate fire behaviour needs to be part of a holistic approach that addresses underlying problems and directs the child's energy into more constructive and socially positive directions (Kafry 1990: 58–59).

While there is certainly a need to address firesetting and other problematic behaviour in children, treatment needs to be directed towards resolving causal problems while not altering positive aspects of the child's behaviour. While the 'rascal' child depicted by Kafry can present difficulties to parents, teachers and other authorities, she suggests that their characteristics are not all negative (Kafry 1990: 53). Certainly there is a need to reduce the child's exposure to hazards and to direct them away from dangerous behaviour such as lighting fires. At the same time, it is important to ensure that the positive aspects of the 'rascal' such as targeted risk-taking, curiosity, openness to new experiences and vitality are not lost, but rather are directed towards positive efforts in educational, sporting or other pursuits.

Specific juvenile firesetting programs

Having considered the research underlying treatments for juvenile firesetters, and considered some of the best practice approaches in this field, it may be useful to outline some of the specific juvenile firesetter intervention programs that have been implemented by fire services overseas and in Australia.

United Kingdom

A fire prevention program in Staffordshire was established in 1993 following a number of juvenile deaths directly attributable to children playing with fire (Catchpole 1994: 25). The resulting project was set up with 14 volunteer counsellors, all members of the fire service, who were trained by child psychologists. The program targets children three to 17 years who have been identified playing or experimenting with fire. Each child is visited up to three times by a counsellor who uses audio-visual aids, such as video of a living room on fire, to reinforce awareness of the dangers of fire.

A similar program in Merseyside, the Fire Awareness Child Education (FACE) scheme was established in 1988 to address the causes of firesetting in children aged four to 10 years (Catchpole 1994: 26). Through a multi-agency approach involving fire and social services, schools and hospitals, the child receives counselling and education while the counsellor assesses their family background and circumstances. Parents are involved throughout the program to raise their awareness and help resolve family problems that

may be contributing to the firesetting behaviour. A variation of FACE has subsequently been introduced as a community-based alternative to incarceration for certain cases of teenage arson, while another variation has been used as a rehabilitative program for convicted arsonists and other prisoners in HM Prison Liverpool (Hayes 1999). The Staffordshire and Merseyside programs have reported considerable success with only five per cent of children from one program and none from the other being involved in further offending and requiring further intervention (Catchpole 1994: 25, 26).

The Leicestershire Fire and Rescue Service operates a series of programs targeting children from three to 16 years of age (Brown 1999). The Fire CARE (Children At Risk Education) program targets three- to 13-year-olds who are referred by sources such as parents, schools or social services. A male and a female member of the CARE team visit these children and work with them using education materials and counselling techniques to build the child's understanding of fire and determine the reasons underlying their problem behaviour. Where necessary the CARE team will use referrals to other agencies who can address underlying problems.

In the 13 Plus scheme, the Leicestershire service targets older children who have been before the courts for fire-related offences (Brown 1999: 29). The scheme provides an alternative to custodial or other sanctions and involves counselling, awareness-raising and involving the child in community work that has a fire safety emphasis.

Young people between 14 and 16 years showing serious disaffection with school and community life, and manifesting actual or potential firesetting behaviour, may also be helped through Leicestershire's Firebreak initiative (Brown 1999: 29). This scheme is designed to develop a sense of pride, teamwork, leadership and self-discipline skills within the environment of a real fire situation. Through realistic training, drills and classroom teaching the youth are taught to extinguish a range of fires. To heighten the experience, they wear a uniform and are responsible for operating a fire appliance.

Australian jurisdictions

Australian Capital Territory

The ACT Fire Brigade runs a Juvenile Fire Awareness and Intervention Program. This program identifies three- to 16-year-olds with fire-lighting tendencies or an interest in fireplay. Children may be referred by parents, schools, police, courts, hospitals, mental heath services, day care services, youth justice services or the Emergency Services Bureau. Following parental consent, the child participates in fire awareness sessions. The brigade also conducts a general fire awareness program for kindergarten children (Drabsch 2003: 18).

New South Wales

The NSW Fire Brigades operates interventions at two levels:

1. primary intervention – classroom presentations where officers talk with children about fire competent behaviours; and
2. secondary intervention – programs to deal with children identified as having inappropriate firelighting behaviours (Drabsch 2003: 16–17).

The Child Intervention Program commenced in 1990. It aims to determine why the child is lighting fires and develops a course of action, such as referral to appropriate treatment and counselling professionals. An intervention officer from the fire service works in close contact with these professionals.

The Juvenile Intervention and Fire Awareness Program provides telephone advice and a resource kit, direct intervention by a trained firefighter and, if necessary, referral to another agency. The program has cooperative partnerships with the burns unit of the children's hospital, Kidsafe, the Department of Juvenile Justice (for youth conferencing), the Department of Education and Training, the Department of Health (Centre for Mental Health), NSW Police, the Department of Housing, and consultant psychologists.

Management of juvenile bushfire arson offenders in NSW is supported by legislation. The NSW *Young Offenders Regulations 1997*, section 19A ('Outcome plans for bushfire arson juvenile offenders') provides for outcome plans where a young person has admitted lighting a bushfire or damaging or destroying property by means of fire and is directed to attend youth conferencing. The outcome plan must provide for:

- attendance by the child at a burns unit of a participating hospital;
- a meeting between the child and any willing victim; and
- making reparation for the offence, such as assisting in clean-up operations, treating injured animals and paying compensation.

Northern Territory

The NT Fire Brigade runs a Juvenile Fire Awareness and Intervention Program. This program identifies three- to 16-year-olds with fire-lighting tendencies or an interest in fireplay (Drabsch 2003: 18). Children may be referred to the program by parents, firefighters, teachers, police, health or juvenile justice services. A fire officer visits the child's home to help the child develop an awareness of fire and safety issues. The program uses an award system to encourage behaviour change. This might be a movie ticket or, for older juveniles, a two-day work placement with the brigade.

Queensland

Children are the third largest cause of structural fires and one of the major causes of bushfires in Queensland. The Queensland Fire and Rescue Service designed the Fight Fire Fascination Program to address this problem. A trained fire officer visits the child's home over a six-month period using goals, objectives and rewards to discourage firesetting behaviour (Drabsch 2003: 18–19).

South Australia

The Fire Safety Department, SA Fire Services, runs the Juvenile Fire Lighters Intervention Program. Referrals to the program come from parents, doctors, childcare agencies, the children's hospital and family care agencies. The program helps children aged from four to 17. It uses role-plays, discussions and activities run by an experienced fire officer who visits the child's home over a number of weeks. The program is reported to have worked with over 900 families, achieving a 97 per cent success rate (Drabsch 2003: 19).

Tasmania

The Tasmanian Fire Service coordinates a Juvenile Fire Lighter Intervention Program for children between three and 14 who have been referred by parents, schools, health, police or fire services, physicians or community organisations. This program aims to educate children about the dangers and consequences of playing with fire and increasing awareness of fire safety. Over 90 per cent of children who complete the program do not engage in further lighting of fires (Drabsch 2003: 19).

Victoria

Melbourne Fire and Emergency Services Board, the Country Fire Authority and the Royal Children's Hospital are responsible for the Juvenile Fire Awareness and Intervention Program. Children aged three to 16 are visited at home by specially trained firefighters over several weeks. Children participate in role-plays, discussions and activities where they learn respect and awareness for fire and its consequences. Participation is mandatory for juvenile firesetters appearing before the Children's Court (Drabsch 2003: 19).

Western Australia

The WA Fire Service runs the Juvenile and Family Fire Awareness program which aims to teach children about the dangers of playing with fire. The program aims to reduce the risk of firesetting by identifying children undertaking inappropriate fire behaviour (Drabsch 2003: 19).

9 Preventing arson

Throughout the literature, especially that dealing with arson investigation, there are suggestions and recommendations for preventing arson or at least limiting its impacts. As with most areas of arson literature, advice on prevention is primarily centred on arson committed in urban settings. There are serious limitations on the ability to apply the existing literature on arson prevention to a bushfire setting. Preventive measures are usually specific to buildings and not relevant to outside fires, and typically involve approaches such as:

- recognition of management responsibility for arson prevention;
- better design of buildings and use of building materials to limit the ignition and spread of fire;
- improved security and surveillance on unoccupied buildings (after hours) or vacant buildings; and
- ensuring all buildings are fitted with suitable and operative fire protection equipment, including alarms and sprinklers (see, for example, Prins 1994: 91–93).

Understanding the behaviour and motivations of arsonists is an important component of arson prevention, supplementing 'traditional' target hardening approaches based on physical security and approaches that aim to restrict the effects of any ensuing fire (Munday 2000: 30). Background checks by employers and investigators may identify arson-related risks. Assessment of the physical and behavioural evidence can reveal motives to be used not only in prosecution but in preventing future arson attacks (Munday 2000: 30–31).

Recommendations and strategies for preventing bushfires or reducing their impacts typically come after the occurrence of particularly damaging fires, resulting in large-scale property damage and loss of life. The 1991 fires in Oakland, California, for instance, led to a series of recommendations from a task force examining relevant emergency procedures (Lewis 1999). These recommendations included:

- development of local community emergency plans, with emphasis on the community assisting the escape of people who live in wooded areas, especially those who are ill or have disabilities;
- the placing of prominent and visible house numbers on properties in woodland areas;
- installation of sprinkler systems in buildings in wooded areas;
- recruitment and training of volunteers at appropriate levels;
- goat grazing to help vegetation control; and
- education for residents on vegetation control.

As another example of the way large and destructive fires usually lead to demands for action, during the devastating fires in Southern California in 1993, the governor offered a $250,000 bounty for arsonists suspected of starting some of the fires (Van Biema 1993: 36). Another common response is demands, in the media or from politicians, for harsher sentences for those convicted of bushfire arson. While harsher sentences may satisfy a community need to see offenders punished, it is unlikely they will bring about a reduction in rates of offending. Consistent with other findings in the broader criminological field, incarcerated arsonists have reported that they would more likely have been deterred by an increased chance of apprehension than increases in the severity of punishments (Mees 1991: 100). Mees notes the need for enhanced patrols and surveillance, leading to a higher probability of detection.

Many approaches to preventing structural arson involve 'target hardening', or taking measures such as securing buildings that may deter a would-be arsonist by making the crime harder to commit. In the case of bushfires, where target hardening is not a viable option and most other approaches recommended for structural protection do not apply, behaviour-based prevention is likely to be the best tool available.

The WA Arson Task Force has incorporated behavioural approaches in one of the few attempts to recommend specific strategies for reducing the incidence of arson in urban bushland environments (WA Arson Task Force 1999: 21). The task force recommends:

- behaviour change through community education initiatives and school-based information services;
- developing fire management plans that include fuel reduction and emergency response for all urban bushlands;
- promoting neighbour-based fire detection and reporting systems as a way of obtaining prompt advice about fire outbreaks;
- adopting Crime Prevention Through Environmental Design (CPTED) principles when planning in urban bushland areas, as well as using education and awareness programs to encourage appropriate use of bushland and public surveillance and awareness; and
- using risk analysis to identify high-risk and high-value areas in forests, parks and reserves where improved prescribed burning programs can be conducted.

If fire services and law enforcement were able to identify areas where bushfire arsonists may strike, they may be able to more effectively deploy resources to monitor and patrol potential crime sites, as well as being prepared to respond more quickly when a fire breaks out. Drawing on fire risk management research conducted by the South Australian

Department of Environment and Natural Resources, and McLean's (2000) paper on fires in the Dandenong Ranges of Victoria, Bahr has developed an analysis model that can be used to target potential bushfire arsonists (Bahr 2002). Bahr's model combines the situational, spatial and temporal dimensions of fires identified by McLean with an assessment of the hazard level presented by a fire and its risk of ignition. Using this analysis model potentially allows fire agencies to proactively deploy resources and surveillance efforts into those areas and at those times where the risk of an arson attack is greatest. As Bahr notes (2002: 72), these efforts may not fully deter a motivated and committed arsonist, but may lead to the offender targeting an area where the fire can be more readily contained and the risk of the fire spreading and endangering life and property can be reduced.

Preventing firefighter arson

Given the potential significance of arson committed by firefighters, as discussed earlier, it would be valuable to consider whether there are specific measures that can be taken to prevent firefighter arson. As previously discussed, although very few firefighters 'cross the line' and maliciously light fires themselves, when they do the impacts can be far-reaching. Firefighter arson also represents an area where genuine prevention is possible, as firefighters constitute a discrete group within the community that is already subject to certain controls and educational regimes.

In order to combat the potential effect of firesetting by one of their own, many fire services, particularly in the United States, have developed programs to educate members of the fire service and to guard against potential firesetters joining the service. The USFA (2003: 27) has suggested that:

> The keys to prevention seem to lie in recognising the problem, acknowledging the serious threat it poses to public safety and to the credibility of the fire service, and improving screening procedures for new recruits.

Education and awareness programs

A number of US states have implemented education and awareness programs for new recruits, generally as part of a formal curriculum. The USFA (2003: 27) has noted that proactive prevention and awareness programs try to instil in cadet firefighters, as well as their more experienced colleagues, a 'zero tolerance' approach to firefighter arson. Programs generally include segments on the legal implications of committing arson, the impacts of arson on the community and the fire service itself, and each firefighter's duties and responsibilities to support anti-arson measures (USFA 2003: 29).

Studies have shown (Huff 1994; USFA 2003) that it is mostly relatively junior firefighters, in the first three years of service, who set fires. Awareness programs, especially during induction, may be able to extinguish firesetting tendencies or thoughts before they manifest in the individual's behaviour. Effective awareness programs may create a wariness in the minds of would-be firesetters and make them consider the consequences – in terms of legal ramifications, the responses of their colleagues and the effects on life, property and the fire service – if they were caught lighting fires.

Background checks

A number of fire services have introduced background checks and implemented screening processes to try and prevent those with a previous history of firesetting, or who demonstrate the potential to become firesetters, from joining the service. The NSW Rural Fire Service has recently introduced criminal history checks for all new volunteers, although the service stresses that the commission of unrelated offences would not necessarily prevent someone joining the service (Howden 2004).

There are certainly significant benefits to implementing criminal history checks. Clearly a check will disclose whether a volunteer has previous convictions relating to firesetting or other offences that may be of concern, such as other forms of criminal damage. Requiring a person to agree to checks being carried out sends a message about forms of behaviour that are unacceptable to the fire service and the community.

However, criminal history checks are not without significant limitations, particularly as they will only disclose offences for which a person has been convicted. If a person has set fires in the past but avoided detection, or been detected but not convicted, there will be no criminal history of their activities. Most, if not all, Australian jurisdictions have 'spent convictions' legislation. This allows a person to not disclose convictions, other than for very serious offences, once a certain amount of time has passed. This period is usually 10 years. Under the legislation, a person may legally deny they have ever been convicted of an offence once the required period has passed. While organisations such as criminal justice agencies and emergency services agencies can generally gain exemption from these laws and thereby access older records, this requires regulations to be made by government. Even with exemption, fire services may not be able to access juvenile criminal history records, which may lead to prior offences remaining hidden, particularly given the proportion of firesetting that is carried out by children and adolescents.

Background checks can also be difficult to implement and carry out, particularly in volunteer fire services. Volunteer services may not have the infrastructure to easily carry out the checks, particularly if the local units operate autonomously without a central administration. The police service providing the criminal history information may levy a cost for this service, which may be an issue particularly for smaller units or those taking on a number of new

volunteers. It may take a number of weeks to obtain the results of the check, which could become a problem if fire services are trying to take on new volunteers ahead of an impending fire season.

Even if these problems are overcome, the decision to require criminal history checking should not be taken lightly. Any background checking raises privacy issues and fire services will usually need legal advice to make sure they do not breach privacy legislation. Having to agree to a check being carried out may put off potential volunteers, particularly if a person has a past conviction, perhaps for an offence which they committed as a young adult and now regret, which may be completely unrelated to firesetting. This is likely to be more of an issue in small communities, especially as knowledge that a past conviction has been uncovered may be hard to keep within the fire service and where it may unfairly affect a person's standing in the community.

The Office of the State Fire Marshal in the US state of Pennsylvania has attempted to get around these problems with an alternative that yields some of the benefits of a background check while providing some protection against the fire service being held liable if a member should ever commit arson (USFA 2003: 28). Applicants to Pennsylvania fire departments are required to submit an affidavit for fire company membership. Before a magistrate, applicants must affirm they have never been convicted, pleaded no contest or been found guilty of arson or making false alarms to public service agencies. The applicant must affirm that they have read and understand the definitions of arson and false alarms in the legislation and have never committed or engaged in those acts. The applicant also affirms that they have made full disclosure to the fire department of any arrests, convictions or adjudications for any other criminal offences. If a subsequent investigation reveals that the person has falsified or misrepresented a criminal history, they are liable to forfeit their membership of the fire service and face criminal penalties for perjury.

Screening tests

The use of psychological screening instruments represents an avenue by which fire services may be able to identify members or applicants with a predisposition or heightened risk of becoming involved with firesetting. There are various dimensions to the screening that may be conducted. Some tests will aim to indicate a person's suitability across certain dimensions applicable to any public safety role, such as maturity, judgment and decision-making, leadership and ability to cope with stressful situations. Other tests will aim to more directly identify potential problems by assessing an applicant against known risk factors and profiles related to firesetting.

The South Carolina Forestry Commission developed a system, the Arson Screening and Prediction System (ASAP), to analyse a subject's responses across eight domains and compare these with arson profile characteristics, as set out in Table 5 of this report (USFA

2003: 30). The assessment instrument is not intended to identify a person as an arsonist, but allows further assessment of the applicant on the basis of identified risk. The eight domains measured by the ASAP are (USFA 2003: 30–31):

1. personal (age, race, gender);
2. marital and family (relationships with parents, marital adjustment, childhood family environment);
3. occupational (employment and work history);
4. social interaction (social and interpersonal skills and problem-solving, empathy);
5. personal and emotional needs (self-control, impulsiveness, aggression, anger threshold);
6. self-esteem (intelligence, academic performance, self-esteem);
7. stress (financial management, income levels, family and legal stress); and
8. fire service attitudes (fascination with fire and fire services).

An applicant's responses are scored, with higher scores more closely resembling the profiles of known arsonists.

In Australia a number of fire services use psychological testing of some form in their recruitment of career firefighters. Some of these assess applicants against general psychological traits shown to be relevant to public safety roles, while others compare an applicant to a profile of the type of person the organisation considers suitable for employment (see, for example, www.fire.nsw.gov.au/recruitment/permanent/stage_two_psychological.pdf; www.fire.qld.gova.au/recruitment/pdf/infopack2.pdf; www.fesa.wa.gov.au/files/info_pack_ffighters.pdf). A number of commercial organisations provide psychological testing services specifically designed for recruitment into public safety organisations and these may be used by Australian fire services (see for example, www.aiof.com.au and www.pacificbehaviour.com.au).

A number of fire services in Australia and New Zealand are testing two new screening instruments developed specifically to target potential arsonists during the recruitment of volunteer firefighters (Doley 2003d). The Firefighter Selection and Screening Interview (FSSI) uses a semi-structured interview format. It allows a trained interviewer to examine key areas of an applicant's life and experiences in terms of characteristics linked to firefighter arsonists. The Arson Screening and Prediction instrument (ASAP) uses a questionnaire completed by the applicant and compares the applicant's responses to the volunteer firefighter arsonist profile. It has the advantage of being able to be administered, scored and interpreted by fire administrators (Doley 2003d).

The FSSI and ASAP are yet to be fully evaluated for use in volunteer firefighter recruitment. As Doley (2003d) notes, neither can be an absolute predictor of the likelihood of a given person lighting fires, but they provide a basis on which fire services can more closely examine that person's suitability for firefighting roles.

The use of psychological screening instruments represents an important component of efforts to prevent firefighter arson and is an area warranting much closer consideration. The author will conduct a detailed examination of this topic in the future.

The role of the media

The media can play a valuable role in helping to prevent bushfire arson, or it can potentially provide encouragement to arsonists. The role of the media in reporting bushfires, especially where arson is reported to be involved, can be problematic. The public perception may be that arson is far more prevalent than is really the case due to the very high profile it is given by the media (Drabsch 2003: 15). It is possible that the observed correlation between high fire danger periods and the incidence of deliberately lit bushfires may be triggered in part by the intense media attention given to fires and the work of firefighters.

Media attention may encourage those people who start bushfires in the hope of gaining rewards and recognitions, including volunteer firefighters. Media reports with evocative headlines such as 'Firing squad: this typical rural fire service brigade near Blacktown reveals ordinary people doing extraordinary deeds,' portray firefighters in an almost mythically heroic light:

> …in early December, as in the past summer, only one thing was on their minds—the explosion of the parched Australian bush in what might have been a bushfire holocaust. …they downed tools and went off to pitch themselves into the battle to contain fires and save property. (Brown 2002)

As discussed earlier, volunteer firefighters play a vital role in protecting Australians from bushfires, and their efforts deserve community support and recognition. It is possible though that attention of this type may also serve to encourage people (volunteer firefighters and others) who see an opportunity to gain 'hero' status and recognition for themselves to start fires. Media coverage of fires will always require a difficult balancing act. This balance needs also to recognise that the media plays a vital role in keeping the community informed and assisting them to prepare for meeting the bushfire threat, and that public awareness of the role of volunteer fire organisations generated by the media helps these organisations in their fundraising efforts (Drabsch 2003: 15).

Media reporting of disasters often involves scapegoating and this is true in the case of bushfires. McKay (1996) has shown that media coverage of the Ash Wednesday fires in South Australia in 1983 and the 1994 NSW fires placed considerable emphasis on reports and speculation about the role of arsonists in starting the fires, as well as the role of land-use management techniques in allegedly contributing to the devastating effects of the fires. McKay (1996: 317) has suggested that newspaper reports, by scapegoating the causes of bushfires to arsonists or land managers, can be overly fatalistic. This can undermine the public information and awareness-raising role of the media coverage by not stimulating individuals in the community to adopt self-protection measures. There is a danger that those in bushfire-prone areas will not take steps that could protect their homes from bushfires as they may adopt a 'why bother' attitude.

10 Where to from here?

Arson is a serious criminal offence, the motivations for which can be complex and multifaceted. A deliberately lit and uncontrolled fire carries the potential to inflict property damage running into the millions of dollars and the loss of many lives. There is perhaps no other criminal offence that poses as great a threat, certainly none that is committed as frequently as arson.

The seriousness of arson, the many factors that may underlie and contribute to its commission, and its very real and direct impact on fire services, insurance companies and others, has led to a significant literature on motives for arson. Over time, efforts to understand and classify these motives have shifted from psychodynamic approaches that saw arson as being grounded firmly in psychosexual urges and frustrations, to the development of psychological profiles that draw on all aspects of the offender and the offence to help focus and direct investigations. There has also emerged a sizeable literature on the management and treatment of childhood firesetters and in relation to the characteristics of some particular subgroups, such as serial arsonists and firefighter arsonists. Issues around the prevention and investigation of arson have also enjoyed a degree of attention.

What is obvious, however, is how much of the published literature is specific to arson in urban environments, usually in the context of buildings or vehicles and usually in the United States or the United Kingdom. Within these environments perhaps the most common motive is revenge committed out of anger. A person gets sacked, or rejected by a lover, and responds by burning down their perceived persecutor's business, house or car. In another instance the proprietor of a struggling business decides to burn down the premises for the insurance money. The various typologies, classifications and profiles developed over the years have been framed in this urban environment.

Arson in Australian bushland environments is in many respects a different story. An uncontrolled bushfire can cause massive damage, especially if it spreads into the urban–bush interface. Major bushfires in Australia's past have destroyed hundreds of homes in a single day, and claimed dozens of lives. Deliberately lit bushfires are a persistent feature of the Australian summer, yet little is yet known about why people light them.

The motives commonly seen in urban structural arson will sometimes apply to bushfires. An aggrieved person may start a bushfire as an angry response to a real or perceived injustice, though the choice of a bushland setting rather than a home or business suggests either that the anger was displaced or that the arsonist's rage is directed at society as a whole. There are some cases where financial gain may be a motive for bushfires, but it is much harder to see the prospect of financial rewards coming from a bushfire as it does from a building fire.

It is hard therefore to extrapolate across time and place and apply the motives commonly seen in the literature to bushfire arson. There is a need for a different model, which is presently lacking in the literature. In this paper a first attempt has been made at developing a bushfire arson typology. As a first attempt this typology will need to be scrutinised, critiqued and subjected to empirical analysis. No doubt a somewhat different-looking typology would emerge from this scrutiny and, given the potential benefit to fire services, law enforcement agencies and the community as a whole accruing from a greater understanding of bushfire arson, this would be a valuable addition to our knowledge base. Knowing more about bushfire arsonists creates the possibility of better-directed investigations, a greater likelihood of detection, enhanced prospects for prosecution and greater capacity to effectively manage and treat offenders. Achieving any of these aims could prevent some fires being lit, and could save lives and properties.

Future work direction 1
Further develop and refine a typology and profile specific to bushfire arson offenders.

Developing and refining our understanding of bushfire arson offenders must have a sound empirical basis if it is to be genuinely useful to future researchers and practitioners. One primary source of this data would be through interviews with offenders themselves, seeking to elicit their views on why they committed the offences, what their methods were, how they selected their targets, what could have been done to prevent their offending and so on.

As discussed earlier, there are always some methodological and conceptual difficulties in relying on convicted offenders as a principal source of research data. By definition the sample will only include those offenders who have been caught and may on some measures be unrepresentative of those who were not caught. At the same time, convicted offenders may be the only direct source of information available. Victimisation surveys, which can provide valuable data about other types of offending, are not likely to be of value with bushfire arson as there will not be a clearly defined victim in many cases.

Future work direction 2
Conduct research with convicted bushfire arson offenders to understand their motives, methods and opinions.

There appears to be a large pool of secondary data on the incidence, methods and patterns of bushfire arson in the data collections of fire services, police services and land management agencies. There are a number of bodies holding data on bushfires, including the times, days and months when fires started, the location of the fire, topographical data

and so on. Some of these data collections which will include details of whether the fire was deliberate or not and the data collections of investigation units will hold details of known or suspected offenders and how investigations were conducted.

While there is some integration of fire data in Australia, through the incident reporting system maintained by the Australasian Fire Authorities Council, most of the available data is held in separate collections. A considerable amount of work would be needed if these data were to be brought together in a way that allowed detailed analyses across all data fields to be conducted. This is necessary, however, if a comprehensive picture of deliberately lit bushfires is to emerge.

Future work direction 3
Map bushfire arson-related data collections across Australia. Gather data together as much as possible and analyse to improve understanding of patterns of offending.

Mapping, gathering and analysing data will also be of value in helping our understanding of the incidence of bushfire arson. There is certainly agreement in the published literature and available data, and in the anecdotal reports of experienced firefighters and investigators, that a significant proportion of bushfires are incendiary or at least suspicious. There are pockets of sound empirical data available, and in some geographic areas the extent of deliberate ignition is well known.

There remains though a need for a comprehensive review and analysis of the incidence of deliberate and suspicious ignition of bushfires across Australia. There will always be a degree of speculation around this, as the assessment that a fire has been deliberately lit may contain a degree of subjectivity. Nonetheless, such an analysis has the potential to produce valuable information about patterns of firesetting, perhaps down to the level of identifying particular geographic and socioeconomic areas where high levels of firesetting occur. Identifying patterns to this level could in turn be used to inform attempts to develop profiles of bushfire arsonists, and to identify and direct investigation and prevention resources.

Future work direction 4
Analyse gathered bushfire data to improve our understanding of the incidence of bushfire arson and to identify geographic and socioeconomic patterns in its occurrence.

It is apparent from this review of the literature that there has been little specific attention given to the management and treatment of adult arson offenders. Most of the literature

and the treatment programs in place have been directed towards child firesetters. The literature suggests that adult offenders can either be treated on the basis of their underlying mental illness, if they have one, or can be dealt with through the prison system.

Despite an emphasis on mental illness as a factor in firesetting, particularly among earlier writers, the literature does not examine how to treat an adult offender who exhibits mental illness but for whom the illness is not the sole reason for their offending. Suggesting that arson offenders can just be rehabilitated or otherwise dealt with through the prison system assumes that the experience of imprisonment itself will 'cure' them or that they can be treated using whatever general treatment programs happen to operate in whatever prison environment they are held in. There is a substantial literature to suggest this assumption is fundamentally flawed.

Successful management and treatment of adult bushfire arson offenders will require the application of programs and interventions suited to the needs of the individual offender. In some, perhaps most, cases this can be provided through individual counselling and, where necessary, psychiatric treatment or through existing general interventions and programs. For some offenders, counselling to address issues arising from childhood trauma or from adult relationship difficulties may help. Training to build interpersonal and problem-solving skills will help in some cases, while an anger management program may help in others. For some offenders, a specific arson treatment program might be indicated. For others, the key to a successful outcome may lie in appropriate post-release support.

The difficulty is that we do not really know at this stage what interventions are available and which ones are likely to be effective. There is yet to be published a comprehensive review of custodial or post-release interventions provided in Australia and the types of offenders they are used for. Most correctional bodies, custodial and community, have mechanisms in place to evaluate their programs but at this time not many have been properly evaluated. Where they have been, the results are not necessarily available.

There has also not been any analysis conducted that examines the fundamental elements of bushfire arson offending from the treatment point of view. We do not know whether bushfire arsonists would respond to anger management programs or cognitive skills programs, or how much this varies from one offender to another. Some of this knowledge will stem from a better understanding of the motivations and profiles of bushfire arsonist offenders, but some of it will need to come from examining the various program options and relating them to the motives and profiles.

Such an analysis will reveal how well existing interventions and programs can be applied to bushfire arson, or whether there is a need to develop programs specific to this group of offenders.

Future work direction 5
Examine treatment programs and interventions suitable for adult bushfire arson offenders.

This review briefly touched on some of the investigation and prosecution issues that arise in arson cases. Clear-up rates for arson offences are low. In addition, there are aspects of arson that make investigation and detection difficult and demand specialist skills and techniques. This may be even more so for bushfire arson. The lack of a surrounding structure and materials may reduce the availability of forensic evidence and the sheer size and density of the Australian bush makes it less likely that there will be witnesses. These limitations may make the investigator more reliant on circumstantial evidence.

There is undoubtedly considerable expertise in bushfire arson investigation among Australian fire and police services. A number of jurisdictions have established specialist investigation units and task forces that have achieved high rates of success. Expertise is shared through the investigation subgroup of the Australasian Fire Authorities Council. At the same time there would be considerable value in some of this expertise being brought together in the form of best practice guidelines. This would allow a more formal way in which expertise could be exchanged, and provide a means for this to be shared with organisations outside the investigation subgroup. This may bring in smaller rural and country fire services and land managers who do not have the resources to conduct full investigations but who would benefit from an enhanced capacity to conduct minor or preliminary investigations, or who could more effectively contain potential evidence or report incidents.

Future work direction 6
Draw on the expertise of specialist bushfire arson investigators to develop best practice guidelines for investigation of bushfire arson offences.

If offenders are detected and sufficient evidence exists to charge them, the difficulties that surround bushfire arson investigation may in turn make it difficult to secure prosecutions. Where forensic evidence can be obtained, it may be difficult to successfully convey this complex and technical information to a judge and jury. A case reliant on circumstantial evidence may be difficult to carry. A bushfire may burn large areas of land and require significant firefighting resources to contain it, but not cause structural damage or injury to people despite having the potential to do so. In such a case it may be difficult for a prosecutor to make a judge see the seriousness of the offence involved and the need to give a correspondingly serious sentence.

These comments on prosecution issues are necessarily speculative as there has not been an examination of the issues that genuinely arise in prosecuting bushfire arson cases. While there is some literature on prosecution issues for general arson cases, this needs to be reviewed and applied to the bushfire context.

Future work direction 7
Examine issues surrounding prosecution of bushfire arson offences with a view to assisting prosecution of these cases.

This review also briefly touched on the question of preventing bushfire arson. As discussed earlier, much of the literature on prevention, and the advisory materials produced by fire services and insurance companies, is concerned with structural arson. Preventive measures such as the use of fire-resistant building designs and materials, installation of sprinkler and alarm systems, increased security and so on are certainly valuable in preventing the incidence of arson in built environments but they have, at best, little application to bushfires.

There has been a small number of attempts at developing preventive measures for bushfires, focusing mainly on community awareness and vigilance. The Australian bush covers huge areas and it is clearly not practical (nor desirable) to take target-hardening measures such as fencing off the bush. It may be possible to increase surveillance by fire services, police services and land managers but only if this surveillance can be targeted through an increased understanding of the times and locations where arsonists are most likely to act. The studies by McLean (2000) and Bahr (2002), as cited above, are valuable steps towards this targeting, but further analysis is needed to understand whether their work is being applied by any agencies, or how it could be applied. Further work is needed to develop and refine measures for preventing bushfire arson, to examine the measures being adopted by stakeholder agencies, and the extent to which they are succeeding.

Future work direction 8
Further examine and develop preventive measures applicable to bushfire arson.

One area of prevention discussed above is the use of screening instruments in recruitment and selection of firefighters. Well designed and utilised instruments can help to identify traits and characteristics that may indicate an individual presents a risk of becoming a firesetter, leading to further examination and consideration before that individual is offered or refused entry into a paid or volunteer fire service.

Certainly the implementation of psychological screening tools would not be without its difficulties. The costs may be prohibitive, especially for small rural fire services, and

particularly if the tools need to be administered or analysed by qualified psychologists. There will also be sensitivity around the use of any kind of screening or selection, formal or informal, in small communities. This will include the effects on a person's reputation or status in the community, the possibility of disputes arising between people who must interact in other ways within the community, and the difficulty of refusing to allow an individual to volunteer their time and services to aid the community.

Further work is needed to assess the range and type of screening tools that are available or could be developed, the traits and characteristics these tools would be seeking to measure, how they could be administered and analysed, and the practicality of applying these to volunteer fire services.

Future work direction 9
Examine and analyse the application of psychological screening tools for the selection of paid and volunteer firefighters.

In discussing the costs and impacts of bushfire arson, this review has drawn on the work of the Bureau of Transport Economics, which assessed the economic costs of natural disasters in Australia. The BTE work has provided a vital basis for our understanding of the costs of bushfires and other disasters. That assessment, however, only goes part of the way towards understanding the real cost of bushfire arson.

There are many direct and indirect, financial and non-financial costs arising from bushfires, especially those that impact on urban environments. There may be particular costs that bushfires create which are entirely distinct from other natural disasters and which may not have been fully reflected in the bureau's analysis. The BTE analysis was concerned with disasters, rather than the many bushfires that burn without causing the kind of property or human loss which might qualify them as a 'disaster'. Understanding the real cost of bushfire arson is not possible without having a sound understanding of its real incidence.

There remains a need to develop a costing model which will yield a clearer picture of the costs of bushfire arson. This model could be of huge benefit on a number of bases, in particular for fire and police services trying to gain and allocate investigative resources, local communities trying to prepare for bushfires and for informing government policy in a number of areas.

Future work direction 10
Develop a model for determining the costs of bushfire arson in Australia.

Appendix: Legislation

All Australian states and territories have legislated offences resulting from the unlawful and malicious use of fire. In each jurisdiction it is an offence to use fire to destroy or damage property. In addition there is a Commonwealth offence of destroying or damaging property which has no special provisions regarding the use of fire, though fire could certainly be used to commit the offence.

Some jurisdictions have specific offences to do with the use of fire to endanger life, while others prosecute such offences under general provisions that prohibit endangering life or committing injury. Where a fire results in the death of a person, this would be prosecuted under general manslaughter or murder provisions.

Most jurisdictions have specific offences concerned with the setting of bushfires. In some cases these specifically identify bushfires and were typically legislated following significant bushfire incidents where some of the fires were known or suspected to have been deliberately lit.

All states and territories regard arson as a serious indictable offence with heavy penalties. In many cases arson provisions are established as an extension of criminal damage provisions, with additional penalties where the damage is carried out by means of fire or explosives. This appears to be a recognition of the potential for destruction that fire has, above and beyond most other means of committing damage. Indictable offence provisions relating to arson are summarised in Table A1 below.

In addition to legislation establishing indictable offences under the criminal law for the deliberate and malicious use of fire, most jurisdictions have a range of summary offences relating to the inappropriate lighting of fires in national parks, forests and other open areas. These are typically enacted under legislation covering land management activities such as forestry or national parks legislation, or legislation establishing and governing rural and country fire services.

A range of summary provisions are set out in Table A2. This list is not fully comprehensive. As well as other provisions that may exist in land management-related legislation, there are other prohibitions on the inappropriate use of fire that, for instance, arise incidentally in local council bylaws and legislation governing the use of particular facilities or public areas. The list in Table A2 nonetheless will give an appreciation of the range and type of provisions that exist.

Model Criminal Code

The legal position on arson was examined closely in 2001 by the Model Criminal Code Officers Committee (MCCOC) of the Standing Committee of Attorneys-General (MCCOC 2001). The idea of developing a national model criminal code was proposed by the standing

committee in 1990. MCCOC's analysis of arson is a useful starting point not only for understanding the various state and territory legislative provisions, but for understanding the nature of arson as a criminal offence and the elements that comprise it.

MCCOC saw arson as a form of criminal damage, distinguished only by the need to prove the damage had been caused by fire or explosive, with accompanying higher penalties (MCCOC 2001: 37). In arguing for the need to retain arson as an offence distinct from general criminal damage, MCCOC noted the particular abhorrence with which arson is regarded by the community, and the inherently unpredictable risk of destruction arising from an uncontrolled fire. At the same time, the committee saw the essential point as being that property had been damaged or destroyed and that it should be the fact or extent of the damage that was at issue, rather than the means of causing it. MCCOC concluded that a separate offence of arson was justifiable on a number of grounds, including familiarity and public support (MCCOC 2001: 37–39).

Following its consideration of state and territory legislation, MCCOC (2001: 36) proposed a model criminal code offence of 'arson' which establishes an offence where:

> a person causes damage to a building or conveyance by means of fire or explosive and intends to cause, or is reckless as to causing, damage to that building or conveyance.

A penalty of 15 years imprisonment was proposed, in accord with penalties in the ACT and Victoria.

The model criminal code provision for arson also establishes an offence of:

> making a threat to cause damage to a property or conveyance by means of fire or explosive and intending the victim of the threat to fear that the threat will be carried out. (MCCOC 2001: 36)

It was proposed that the threat offence carry a penalty of seven years' imprisonment.

MCCOC also proposed a separate model criminal code offence of bushfire arson. The committee argued that criminal damage offences, which are concerned with harm to individual property interests, do not adequately reflect the harm to community interests that arise from bushfires (MCCOC 2001: 47). The committee distinguished the model bushfire offence from other arson offences partly on the basis of the risk of catastrophe that comes with a bushfire, rather than on the actual infliction of harm that is the case with other arson offences (MCCOC 2001: 51). The committee argued that the scale of the risk involved with bushfires affects the whole community, rather than individual property owners, and the offence needs to embrace this potential rather than focusing solely on the actual harm, which may – through the efforts of firefighters or otherwise – be minimal.

Noting that the 15-year proposed penalty for bushfire arson under the model code exceeded the 10-year model penalty for endangering life by other means, MCCOC drew on connections with some of the major bushfire incidents of the past (MCCOC 2001: 53). The committee felt this history was a fair basis for establishing an offence which does not require proof that the offender knowingly endangered life or was reckless about the risks of harm to life or property:

> So long as the offender realises the risk that the fire will spread, there is no need for proof of realisation of the extent of the horror which may follow. (MCCOC 2001: 53)

MCCOC therefore proposed an offence, under the title 'bushfires', which arises where:

> a person causes a fire, and intends or is reckless as to causing a fire and is reckless as to the spread of the fire to vegetation of property belong to another. (MCCOC 2001: 46)

The maximum penalty under this model offence is 15 years.

As can be seen in the tables below, the MCCOC model provisions are echoed in specific bushfire offences in the ACT, NSW and Victoria as well as the Western Australian offences on which MCCOC drew.

Table A1: Summary of arson legislation – indictable offences

Jurisdiction	Statute	Section	Offence	Max. penalty
Commonwealth	*Crimes Act 1914*	29 Destroying or damaging Commonwealth property	Intentionally destroying or damaging any Commonwealth property	10 years
Australian Capital Territory	*Criminal Code 2002*	404(1) Arson	Causes damage to a building or vehicle by fire or explosive and intends to cause or is reckless about causing damage to that or any other building or vehicle	15 years or 1,500 penalty units or both
	Criminal Code 2002	404(2)	Threatens to damage a building or vehicle by fire or explosive and intends to cause, or is reckless about causing, fear to the person receiving the threat	7 years or 700 penalty units or both
	Criminal Code 2002	405 Causing bushfires	Intentionally/recklessly causes a fire and is reckless about the spread of the fire to vegetation or property belonging to someone else	15 years or 1,500 penalty units or both
	Crimes Act 1900	117(1) Arson	Destroys or damages any property by fire or explosive	15 years
	Crimes Act 1900	117(2)	Dishonestly, with view to gain, destroys or damages, by fire or explosive, any property	20 years
New South Wales	*Crimes Act 1900*	195	Maliciously destroying or damaging property by fire or explosive	10 years
	Crimes Act 1900	196	Maliciously destroying or damaging property by fire or explosive, intending by the destruction or damage to cause bodily injury	14 years
	Crimes Act 1900	197	Dishonestly destroying or damaging property by fire, with a view to making a gain	14 years

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Table A1: Summary of arson legislation – indictable offences (con't)

Jurisdiction	Statute	Section	Offence	Max. penalty
	Crimes Act 1900	198	Maliciously destroying or damaging property with the intention of endangering life	25 years
	Crimes Act 1900	203E	Intentionally causes a fire and is reckless as to the spread to vegetation	14 years
	Rural Fires Act 1997	100(1)	Sets fire to land and permits fire to escape so as to cause or be likely to cause damage	5 years or 1,000 penalty units
	Young Offenders Regulations 1997	19A	Outcome plans for bushfire/arson juvenile offenders	Provides for youth conferencing and specific reparative outcomes
Northern Territory	*Criminal Code Act*	239 Arson	Unlawfully setting fire to building, ship, vegetable produce, mine or aircraft	Life
	Criminal Code Act	240 Attempt to commit arson	Attempting to unlawfully set a fire in accordance with s 239	14 years
	Criminal Code Act	241 Setting fire to crops and growing plants	Unlawfully setting fire to crops, trees or pasture (in each case whether indigenous or cultivated)	14 years
Queensland	*Criminal Code Act* 1899	461 Arson	Wilfully and unlawfully setting fire to building or structure, vessel, fuel, cultivated vegetable produce, mine, aircraft or motor vehicle	Life
	Criminal Code Act 1899	462 Attempt to commit arson	Attempting to set a fire contrary to s 461	14 years
	Criminal Code Act *1899*	463 Setting fire to crops and growing plants	Wilfully and unlawfully setting fire to crops, indigenous or cultivated hay or grass, indigenous or cultivated trees, saplings or shrubs, or heath, gorse, furze or fern	14 years

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Table A1: Summary of arson legislation – indictable offences (con't)

Jurisdiction	Statute	Section	Offence	Max. penalty
South Australia	*Criminal Law Consolidation Act 1935*	85 Damaging property	Intending to damage property by fire or being recklessly indifferent as to damage by fire or explosives	If completed: Where damage exceeds $30,000, life; damage over $2,500 to $30,000, 5 years; damage $2,500 or less, 2 years For an attempt: Where damage would have exceeded $30,000, 12 years; where damage would have been over $2,500 to $30,000, 3 years; where damage would have not exceeded $2,500, 18 months
	Criminal Law Consolidation Act 1935	85A Recklessly endangering property	Doing an act knowing that the act creates a substantial risk of serious damage to the property of another, with lawful authority	6 years
	Criminal Law Consolidation Act 1935	85B Special provision for causing a bushfire	Intending to cause or recklessly indifferent as to causing a bushfire	20 years
Tasmania	*Criminal Code Act 1924*	268 Arson	Unlawfully setting fire to any structure, vegetable produce, timber, fuel, mine, ship or other vessel, etc.	21 years or discretionary fine or both
	Criminal Code Act 1924	268A Unlawfully setting fire to crops, forest, moorland, peat, etc.	Unlawfully setting fire to any vegetation, living or dead (including forests, trees, saplings, shrubs, grass, litter, bark, logs, etc.)	21 years or discretionary fine or both
	Criminal Code Act 1924	269 Unlawfully setting fire to property	Unlawfully setting fire to any property not covered by sections 268 or 268A	21 years or discretionary fine or both

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Table A1: Summary of arson legislation – indictable offences (con't)

Jurisdiction	Statute	Section	Offence	Max. penalty
	Criminal Code Act 1924	269A Causing a fire with intent to injure person or property	Unlawfully placing flammable or combustible material or doing any other act for the purpose of causing a fire with the intent to injure any person or property	21 years or discretionary fine or both
Victoria	*Crimes Act 1958*	197 Destroying or damaging property	Intentionally and without lawful excuse destroying or damaging property by fire ('arson'), whether or not intending to endanger the life of another, and whether or not with a view to dishonestly gaining	15 years
	Crimes Act 1958	197A Arson causing death	Committing arson as defined in s 197 and thereby causing the death of a person	25 years
	Crimes Act 1958	198 Threats to destroy or damage property	Without lawful excuse making, for the purpose of causing fear, a threat to destroy or damage property belonging to another, or his or her own property in a way which the offender knows or believes will endanger the life of the victim or a third person	5 years
	Crimes Act 1958	201A Intentionally or recklessly causing a bushfire	Intentionally or recklessly causing a fire, and being reckless as to the spread of the fire to vegetation on property belong to another	15 years
	Country Fire Authority Act 1958	39C Causing fire in a country area with intent to cause damage etc. an indictable offence	On any land in country Victoria, doing any act causing a fire or for the purpose of causing a fire with intent to destroy any vegetation, produce, stock, crop, fodder or property belonging to another	12 months to 20 years

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Table A1: Summary of arson legislation – indictable offences (con't)

Jurisdiction	Statute	Section	Offence	Max. penalty
Western Australia	*Criminal Code*	444 Criminal damage	Wilfully and unlawfully destroying or damaging any property by fire	14 years
	Criminal Code	554 Attempts and incitement	Attempting to commit an offence or inciting another to commit an offence (in this case under s 444)	7 years
	Bush Fires Act 1954	32 Offences of lighting or attempting to light a fire likely to injure	Wilfully lighting or causing to be lit or attempting to light a fire; or placing a match or other inflammable or combustible substance etc. in a position that may cause a fire, with the intent of causing a fire – under circumstances likely to injure or damage a person or property (whether or not the fire was actually caused)	14 years or $250,000 or both

Source: Australasian Legal Information Institute (AustLII)

Table A2: Summary of arson legislation – summary offences

Jurisdiction	Statute	Section	Offence	Max. penalty
Australian Capital Territory	*Emergencies Act 2004*	116	Lighting, maintaining or using a fire in the open air in an area where a total fire ban is in place	50 penalty units
	Emergencies Act 2004	125	Intentionally lighting, maintaining or using a fire in the open air or burning flammable material on any land, or engages in conduct reckless about whether it would cause a fire	12 months or 100 penalty units or both if during the bushfire season (otherwise 6 months or 50 penalty units or both)
	Emergencies Act 2004	126	Lighting, maintaining or using a fire in the open air on any land, and leaving the fire without extinguishing it or leaving it under the control of a responsible adult	100 penalty units if during the bushfire season (otherwise 50 penalty units)
New South Wales	*Forestry Regulation 1999*	22	Leaving or depositing a lighted cigarette or other tobacco product, or a lighted match, in a forestry area	20 penalty units
	National Parks and Wildlife Regulation 2002	14	Lighting a fire in a national park other than in a fireplace, when a total fire ban is in place; leaving a fire unattended; failing to report or extinguish a fire; handle any flammable substance in a way likely to cause a fire	30 penalty units
	Rural Fires Act 1997	88	Lighting a fire on land within a fire district or rural fire district in circumstances in which doing so would be likely to be dangerous to any building	12 months or 50 penalty units
	Rural Fires Act 1997	100(1)	Sets fire to land and permits fire to escape so as to cause or be likely to cause damage	5 years or 1,000 penalty units

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Table A2: Summary of arson legislation – summary offences (con't)

Jurisdiction	Statute	Section	Offence	Max. penalty
	Rural Fires Act 1997	100(2)	Leaves fire before extinguished	12 months or 50 penalty units
Northern Territory	*Fire and Emergency Act*	35 General offences	Dropping or discarding any burning material causing a fire, or in circumstances likely to cause a fire (as well as other acts relating to fire services and equipment)	2 years or $10,000
	Fire and Emergency Act	36 Fires to be extinguished	Leaving a fire unattended without extinguishing it	2 years or $10,000
Queensland	*Fire and Rescue Act 1990*	62 Offence to light unauthorised fire	Lighting a fire not authorised by the Act or by notification, notice or permit	6 months or 50 penalty units (if during a state of fire emergency – 12 months or 250 penalty units)
	Fire and Rescue Act 1990	72 Offences re lighting fires	Leaving fires unattended; discarding burning article or substance so causing a fire endangering or likely to endanger a person, property or the environment, or in circumstances where this is likely	6 months or 50 penalty units (if during a state of fire emergency – 12 months or 250 penalty units)
South Australia	*Country Fires Act 1989*	36 Fires during fire danger season	Lighting or maintaining a fire in the open air during the fire danger seasons (other than in prescribed circumstances and for prescribed purposes)	12 months or fine ($300–$4,000) for first offence; 2 years or $8,000 for subsequent offences
Victoria	*Country Fire Authority Act 1958*	37 General prohibition against lighting open air fires	Lighting a fire in the open air in the country area of Victoria during a fire danger period unless authorised or directed	12 months or 50 penalty units or both

Continued next page

Table A2: Summary of arson legislation – summary offences (con't)

Jurisdiction	Statute	Section	Offence	Max. penalty
	Country Fire Authority Act 1958	39 Prohibited actions near fires	During a fire danger period: leaving a burning fire without leaving another in charge or extinguishing it; being in the open air and throwing down or dropping a lighted cigarette, match or other burning material; undertaking certain other fire hazardous acts; failing to report a burning fire	12 months or 50 penalty units or both
	Country Fire Authority Act 1958	39A Causing fire in country area in extreme conditions of weather, etc. an offence	On any land in country Victoria, lighting any fire in circumstances of location, atmospheric temperature, wind velocity and flammable vegetation or other combustible substance that causes or is likely to cause a danger to life or property of others	3 months to 2 years
	Forests Act 1958	63 Restrictions as to lighting etc. fires in certain areas	Lighting – intentionally or negligently and where authority should have been obtained – or maintaining a fire in the open air in a state forest or national park; failing to prevent the spread of a fire; leaving a fire without taking reasonable precautions to prevent it spreading or causing injury	2 years or 100 penalty units

Source: Australasian Legal Information Institute (AustLII)

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This monograph provides a review of previous studies on arson and deliberate firesetting, beginning with an examination of Australian and overseas research on arson in urban-structural settings. Particular emphasis is given to looking at the motives and profiles of people who light fires. The report then examines the factors underlying arson in Australian bushland settings and how the knowledge gained from earlier studies can be applied to bushfire arson. The report considers the impacts of deliberately lit bushfires and looks at issues around prevention of bushfire arson and treatment of arson offenders. The author presents a typology of deliberately lit bushfires and gives special consideration to firesetting by children and firefighters. The report concludes with proposed directions for future work to build our understanding of bushfire arson.

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