

HUMAN CAUSED: REDUCING THE IMPACT OF DELIBERATELY LIT BUSHFIRES

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Abstract

Although bushfires are a natural phenomenon in Australia, and Australia is among the more fire-prone nations on Earth, comparatively few of the 30,000 to 40,000 fires that occur across Australia each year originate from natural causes. The majority of fires are human-caused and the greatest single contributor is wilful and malicious lighting. The numbers of fires escalate around major urban centres, facilitated not only by higher incidences of accidental fires, but primarily driven by increased proportions of deliberate lightings. The impact of these numerous smaller fires on the community and the environment, particularly within remnant vegetation near the urban fringe, is significant. Many bushfires that burn each year are preventable, but to do this we must know more about the nature of bushfire arson; when, where and why people light fires in bushland settings.

Very few ($\leq 1\%$) of these thousands of deliberately fires are the result of pyromania. Firesetting commonly reflects an attempt by the firesetter to effect 'positive' changes in their life with regard to an underlying desire or dissatisfaction. Although some fires are possibly lit without motive, including some of those of lit by children and people who have a psychological disturbance at the time of firesetting, many fires are lit in the effort to create excitement or relieve boredom, to gain attention or recognition, lit for a specific purpose or gain, including expressions of frustration or anger, or more than one of these motives. Reduction in bushfire arson must necessarily involve the investigation and prosecution of offenders, but also efforts to address the underlying societal and psychological issues that lead arsonists to choose firesetting as a preferred means of expressing their emotional frustration. Increased community awareness plays a significant role not only in the detection of firesetters, but also in the prevention of deliberate firesetting in bushland settings.

Introduction

Bushfires are often stated to be a fact of life in Australia. We are reminded that ecosystems have evolved under the influence of fire and that communities in fire-affected areas must prepare for the threat of bushfires that comes with every summer. While natural causes, and to a lesser extent accidents are responsible for the majority of devastating bushfires in Australia, the impacts by the greater number of smaller deliberate fires are significant.

Even a small grass fire lit by children as fire-play or experimentation can quickly spread and impact on properties given the right conditions. As firesetters commonly only travel small distances from their homes when lighting fires (McLean 2000) short travel times are required before the fire potentially endangers life or property. Even where deliberately lit fires do not damage property or cause injuries there are many less obvious costs to society. Where fire crews attend there is a cost impact on the agency or agencies involved and on the time of its members, many of whom volunteer. Responding to deliberately lit fires in peak bushfire danger periods places great strain on the resources of fire fighting crews, increasing the risk other fires will spread. There is also the ever present danger of injury or accidents to crews, whether in travel or at the fire scene. In the case of arson deployment of police and in some cases judicial and correctional resources places an unnecessary strain on these services, and potentially further impact on already burdened land managers and fire services.

Although many native flora species have adapted to cope with or even exploit fire, not all species respond equally. Unnatural and unplanned fires cause extensive damage to fire-sensitive species and can reduce floral and faunal biodiversity (Cheney 1995). Few species respond positively to the frequency of deliberate firesetting that is common to urban areas. Severe disruption to reproductive cycles and hence their regenerative capacity, facilitates the invasion of weeds which further disrupts or potentially destroys natural habitats. Additionally, unplanned fires interfere with land management and hazard reduction programs; contribute significant pollution in the form of smoke and greenhouse gases; and reduce amenity to recreational areas.

Particularly devastating is the detrimental impact that arson has on the psychological well-being and cohesiveness of the community. Fires lit by arsonists in bushfire danger periods, particularly when they occur amidst a backdrop of other damaging fires, have a debilitating effect on community confidence. Strong reactions from the media may focus community outrage and political attention toward establishing blame for the devastation, often with resultant backlashes against the policies or practices of fire services and land managers.

Tackling the often controversial issue of bushfire arson must be founded on a solid evidentiary base. In this paper we present the results of recent research examining the incidence of deliberate bushfire ignitions across Australia, present a motive-based typology of deliberately lit bushfires and discuss measures, including how an understanding of the human behaviours can help reduce the incidence of bushfire arson.

Cause of bushfires: the role of arson

Based on data provided by the major fire services across Australia (data sources outlined in the acknowledgements section of this paper) 30,000 to 40,000 vegetation fires, ranging in size from tens of metres squared to greater than 100,000 ha occur across Australia every year. This does not include those fires conducted as a part of approved land management practices for which attendance by fire agencies is not required. While fires started by lightning strikes are responsible for the vast majority of land burnt in Australia, and as demonstrated by the January fires of 2002–03 have the capacity to cause significant damage when they enter rural and urban environments, the number of natural fires in any one year is comparatively small. The numbers and severity of natural fires is strongly linked to fluctuations in climatic and local weather conditions. However, broadly speaking they account for 5–30 percent of fires attended by agencies whose jurisdictions cover national parks, state forests, reserves etc. In contrast, natural fires typically accounts for less than 2 percent of fires in most urban areas. The vast majority of bushfires are the result of human activities. Be they accidental or deliberate in nature, many are preventable.

The proportion of fires classified as arson varies between states and territories, and between the provinces and fire fighting agencies within those regions. These differences not only reflect genuine variations in the incidence of arson, but also reflect methodological differences, including: variability in methods of classifying fire cause; the preparedness to infer arson has occurred in the face of limited data; and resources available for arson investigation. Australia-wide reported arson rates (includes both identified and suspected arson) vary between 9 and 68 percent but these figures are strongly impacted by the number of unknown attributions, which vary between 2 and 79 percent. Of the large percentage of fires whose cause is ‘unknown’ in any jurisdiction a high proportion are likely to be deliberately lit, as the assignment of an unknown determination often reflects a lack of any natural or clearly accidental reason for the fire. At a minimum arson has been identified or is suspected for 30 percent of fires across Australia. If cause certainty was increased, the proportion of bushfires that are deliberately lit in many jurisdictions would probably increase to 50-65 percent.

Given that human beings are the primary causal agent of bushfires and Australia boasts one the highest degrees of urbanisation in the world, it is not surprising that greater fire frequencies are evident within or around urban centres, particularly the capital cities. Within the metropolitan district itself, the highest fire numbers tend to occur in the urban fringe compared to the city centre, in part because this is where humanity meets the bushland face-to-face. However, arson is the single largest identified contributor to the higher fire frequencies in or near metropolitan areas. Consequently, the regions incorporating major urban centres are typically characterised by higher arson rates – 10-20 percent higher – than the state or regional average. There appears to be a flow on effect to the distribution of fires within nature reserves that are proximal to highly urbanised areas. At this point no attempt has been made to identify if arson rates are correlated with other socioeconomic or demographic factors (e.g. high unemployment rates particularly amongst the young, high levels of crime etc). Closer examination of the data reveals distinctly higher arson rates within particular suburbs or postcodes. In some cases this reflects the operation of one or more serial arsonists, in others a high overall rate of arson activity. The greatest frequencies of deliberate lightings coincide with the bushfire season, although arson is more likely than other causes to extend outside this period. Up to 40–50 percent of fires occur on weekends. This ‘weekend effect’ is commonly more pronounced for deliberate lightings than other causes. However, people are more likely to engage in activities that bring them into contact with the environment or undertake activities that may precipitate a fire occurring on weekends (e.g. visit the local park to have a barbeque, or weld in the backyard). Hence, the weekend effect is also observed for non-arson related causes. The development of the weekend effect is also influenced by other demographic factors.

In summary, people are responsible for bushfires; the greater the number of people, the higher the risk of accidental fires and the greater the likelihood of conditions conducive to firesetting becoming a preferred behavioural expression.

Why people light bushfires: motivations of arsonists

Commonly, arsonists are viewed within the community as pyromaniacs. However, as early as 1867, Griesinger argued that labelling firesetting as pyromania intrinsically reflected a failure to investigate the individual psychological peculiarities that gave rise to the firesetting impulse (Greisinger 1867, in Lejoyeux et al. 2006). It is

an argument concurred by researchers today; pyromania is cited as responsible for less than equal to 1 percent of fires (see Ritchie and Huff 1999; Shea 2002). Firesetting commonly reflects an attempt to effect ‘positive’ changes, as perceived by the individual, in relation to an underlying desire or dissatisfaction. Utilising existing research into motives behind urban-structural arson and the limited body of research available for bushfire arson, Willis (2004) formulated a five-fold motive-based typology, each with a range of sub-types. These are:

1. *Bushfires lit to create excitement or relieve boredom*
 - *Vandalism* – by individuals or groups; with or without intention for fire to spread.
 - *Stimulation* – seeks excitement/stimulation of seeing fire crews and possibly media arrive; property damage usually unintended but potential for damage may heighten the experience.
 - *Activity* – fires lit to generate activity and relieve boredom or tension.
2. *Bushfires lit for recognition and attention*
 - *Heroism* – may gain positive recognition/rewards by reporting or suppressing fire.
 - *Pleading* – ‘cry for help’; seeks recognition and attention as a means of securing help.
3. *Bushfires lit for a specific purpose or gain*
 - *Anger* – revenge or as an expression of anger or protest.
 - *Pragmatic* – lit where other means of obtaining the objective are impractical or illegal, e.g. land clearing.
 - *Material* – fires are lit for material gain; e.g. firefighters seeking overtime.
 - *Altruistic* – fire believed to benefit others; e.g. clearing fuel loads prevent future fire.
4. *Bushfires lit without motive*
 - *Psychiatric* – psychological or psychiatric impulses derived from mental disabilities; no other motive; lack of control over their actions; lacks capacity to form malicious intent.
 - *Children* – firesetting was a form of play or experimentation; without malicious intent.
5. *Bushfires lit with mixed motives*
 - *Multiple* – several of the above motives arise at one time.
 - *Incidental* – results from spread of a fire that was lit with malicious intent, but without any expectation that a bushfire would result.

The relative importance of these motives is difficult to assess given the very low clear-up rates for bushfire arson generally. However, it is pertinent to comment on two common groupings that are of community concern, namely the committed arsonist who selects the worst possible moment, on the worst possible day to create the greatest havoc and damage possible, and children. No doubt the former does exist, and is naturally of concern. Investigations of fires lit on very high or extreme bushfire danger days will likely apprehend firesetters who seek stimulation. However, this typology may not represent the majority of cases. Where information is available the proportion of deliberately lit fires typically decreases with increasing fire danger. Most deliberately lit fires are small (<1 ha). Sadly bushfire arson appears to occur on any day that a suitably motivated person is brought into contact with vegetation within their neighbourhood. The offender does not necessarily take into consideration the potential danger it poses. Firesetters who have taken a degree of care in planning their fires will tend to create ignitions in accessible locations where suspicions will not be raised if they are observed before or after the act. This includes setting fires in close proximity to walking trails and within accessible distances from residential areas (McLean 2000).

In the United States children are considered to be responsible for 60–75 percent of all deliberately lit fires (Stanley 2002). Conflicting evidence exists with regard to the situation in Australia. Preliminary analysis of police and fire services case files indicates a large proportion of deliberate bushfires in Australia are lit by children. However, this likely partially reflects a lack of sophistication, and the absence of efforts to avoid detection in child firesetting. For the fire incident databases where firesetting by children less than 16 years of age are delineated, children account for 1–6 percent of all fires. This is likely an underestimate as it requires the firesetter to be observed. That children less than 12 years of age may contribute significantly to overall fire numbers is borne out by Western Australia’s Fire and Emergency Services Authority’s observation that a failure to target primary school’s immediately adjacent to the target area resulted in less effective bushfire reductions (Smith 2004). The numbers of fires lit by 0–5 yrs is comparatively small. With increasing age both the frequency of firesetting increases and the materials and locations utilised for firesetting become increasingly complex. By 13–16 years of the timing of firesetting trends largely

reflects that observed in the community overall. Significantly, fires lit by less than 16 years of age are not classified as arson herein.

Deterrents to bushfire arson

Given that somewhere between 8000 and 24,000 vegetation fires every year are likely deliberately lit, and that both the frequency and proportion of deliberately lit fires in some jurisdictions continues to rise, a major change in the “culture” of firesetting in Australian society is required. Currently, there is an attempt to facilitate these changes through three very different channels, namely prosecution of bushfire offences, prevention campaigns and adequately addressing the issues that lead to firesetting behaviour.

Prosecution

Responding to the devastating fires that affected Sydney in 2001–2002, many of which were deliberately lit, the NSW Police Service set up *Operation Tronto*, a 35-person force tasked with investigating the cause and origin of all bushfires in that State during the gazetted bushfire danger period. *Tronto* drew on expertise from the NSW Fire Brigades, the NSW Rural Fire Service, and the Emergency Operations Centre. *Operation Tronto* conducted detailed coronial investigations and prosecuted firesetters at a rate well above that usually seen in arson cases. Its success led to the subsequent re-establishment of the operation in two following bushfire seasons (McDonnell and Laycock 2004). In all the operation investigated over 1500 fires and provided an unprecedented level of police involvement in responding to the bushfire threat.

Operation Tronto provides a good example of the results that can be achieved through cooperative arrangements between fire services, land management agencies and the criminal justice system. Throughout Australia agencies with bushfire responsibilities lend their expertise to police services. As noted by COAG (Ellis et al. 2004), cooperation and information sharing are important aspects of the response to malicious ignitions and throughout Australia effective relationships exist between bushfire agencies and police services.

Examination of specific instances of intensive firesetting within the historical record for a particular suburb reveals that continuous monitoring of firesetting would likely improve the detection and apprehension of serial arsonists in these instances. In those cases identified, serial arsonists appear to conduct intensive firesetting within geographically restricted areas, over comparatively short intervals (several months), often with firesetting occurring daily or at a minimum several times a week, often with multiple firesetting occurring in neighbouring suburbs on a particular day. The observation that urban-structural arsonists’ residence, workplace or other significant locality commonly lie within several kilometres of a fire’s locality appears borne out in the bushfire data where that information is available, making the utilisation of geographical profiling techniques of benefit in these instances.

In the wake of damaging bushfires across Australia in recent years and community concern about the role of arson, most Australian jurisdictions have established criminal offences specifically relating to lighting bushfires. In 2001 the Model Criminal Code Officers Committee (MCCOC) of the Standing Committee of Attorneys-General argued existing criminal damage offences, which primarily concern individual property interests, did not adequately reflect the harm to community interests arising from bushfires. They recommended the establishment of a separate model criminal code for bushfire arson (MCCOC 2001, p47), proposing a 15-year imprisonment for the offence of causing a bushfire and being reckless as to the spread of the fire to vegetation or property belonging to another (MCCOC 2001: 46 & 53). Significantly, this exceeds the 10-year model penalty for endangering life by other means, establishing bushfire arson as one of the most serious criminal offences. Moreover, there was no requirement to establish intent to endanger life, merely that the offender was reckless as to the possible consequences of his or her actions (MCCOC 2001, p53).

While the introduction of harsher sentences can meet some of the community’s perceived needs, in themselves they are unlikely to reduce deliberate bushfire ignitions. For criminal deterrence to be effective it requires not only an appropriate severity of potential punishment but also an apprehension that illegal activity will certainly result in punishment. Police and fire agencies can contribute to a reduction in firesetting through actions and policies that work with the community to establish within the minds of potential firesetters a perception of increased certainty of being caught if they light fires, and when caught experiences the consequences of that action. Publicity of investigative campaigns like *Operation Tronto* can have a significant role to play in this process.

Nevertheless, investigative and prosecution channels are inherently limited by the ‘specialised and trained’ resources that are available to them. For example, arson offences are usually classed as criminal offences and this requires specific procedures and highly trained personnel from fire agencies or public management agencies to

initiate investigations and then to involve police in the enforcement and prosecution. It may be difficult for public land managers to obtain sufficient police interest in investigating a series of comparatively small, yet systematic fires on public lands where there has been no substantive threat to private property, simply because the resources are not available to the police given their other significant community policing demands.

Prevention and treatment programs

Complementary approaches include education and arson reduction campaigns that prevent firesetting from taking place and the treatment of offenders to reduce the incidence of recidivism.

Currently, education and prevention campaigns primarily target children and adolescents. Arson prevention programs for young people have been established across all Australian jurisdictions (see Willis 2004) to address the needs of young people who have been referred by concerned parents, schools police, courts, hospitals, mental health services, youth services etc as having fire-lighting tendencies or an interest in fireplay. Some also conduct educational programs within schools regarding fire competent behaviours and/or fire danger.

Recognising the significant impact of bushfire arson in their state, the Western Australia Fire and Emergency Services Authority in December 2001 implemented a multifaceted and targeted, community-centred bush fire arson reduction program (Smith 2004). They recognised that bush fire lighting is often undertaken by children and others who may be unaware of, or who have not considered the possible consequences of their actions. In this program the community as a whole was enlisted in the process of bushfire reduction. This campaign had a dramatic impact on the numbers of fires lit in the targeted areas, both on the short-term (COAG Inquiry; Ellis et al. 2004, p97), and over more sustained intervals (Smith 2004). This program illustrates the beneficial results that can be achieved through intensive, well researched and targeted campaigns which draw on the strengths of community participation to provide the solution. With appropriate benchmarking to allow evaluation, and research into the specific issues relevant to each jurisdiction, such campaigns could be applied elsewhere.

An important consideration in any arson prevention program is the need to consider the firesetting behaviour not in isolation, but in the context of background factors that may be contributing to it, including within the societal framework in which those behaviours manifested. As noted above, firesetting commonly manifests in response to an underlying issue. Studies of firesetting in young people suggest that those who engage in problematic firesetting, rather than simply fire-play or experimentation, typically display troubled backgrounds characterised by family problems and abuse, with flow-on effects to their relationships or academic schooling (see Willis 2004 for summary: 69). Nevertheless, young firesetters are also a diverse group that exhibits a range of emotional, behavioural and psychological issues (Bergeron 2003). Firesetting is not merely a severe behaviour disorder but may be indicative of distress, alienation, depression and thought disorder or poor reality testing (Moore et al. 1996). Treatment options including behaviour modification, psychodynamic theory, and family-centred, cognitive behavioural therapy and group therapies, seek to identify and deal with the underlying issues that lead the individual to firesetting behaviours. Successfully resolving those issues reduces the risk of future offending both within firesetting and other criminal arenas. Although such programs are a necessary component of juvenile detention programs, where possible, treatment options need to be implemented prior to the young person entering the juvenile justice system. This requires the development of an effective collaborative relationship between fire and mental health services.

Furthering the effort

Agency responses described here, such as dealing with factors contributing to firesetting and increasing the certainty of detection through fire service and police responses, can only be effectively developed and applied if they are supported by a strong evidence base. Understanding the motives that drive offending, and the circumstances in which offending occurs, can provide a basis for building efforts to counteract it. What determines the success of the fire from an arsonist's point of view depends on the individual's motivations for lighting the fire. There is a long history of social science research into the motives of arsonists in urban-structural arson (typically buildings and vehicles) in the United Kingdom and the United States (see Willis 2004, p21–60 for a detailed review of this work). While the motives outlined above provide a solid framework, comparatively little research has addressed the motives of bushfire arsonists, particularly in the Australian context. With this understanding of deliberately lit fires, interventions can be developed that respond to the inclinations, and the needs, of individuals who might commit each type of offence. This might take the form of greater vigilance from rangers, targeted prevention and education campaigns, or even providing the infrastructure that enables young people in resource-depleted environments to express themselves creatively rather than via vandalism or for stimulation. Understanding these motives and behaviours enables fire services to screen applicants who join a fire

service seeking recognition and attention, but inherently fulfil those psychological needs through firesetting. By addressing the underlying factors that contribute to firesetting, and teaching the skills that enable a person to make healthier choices, it is possible to bring about positive outcomes for the community, the least of which is a reduction in the number of deliberate bushfire ignitions.

Although fire services operate some excellent intervention and education programs for young people, there is a distinct deficit of programs, including within the correctional system, that target adults who may have lit fires or are at risk of doing so. This remains a significant need.

Conclusions

Bushfires will always be a threat to Australian communities and there will always remain a need for communities in bushfire prone areas to prepare for this threat. However, analysis of the bushfire data across Australia indicates a high number of bushfires are deliberately lit, with the overall numbers of fires and the incidence of arson increasing with population density. By addressing the issue of arson, there is a valuable opportunity to significantly reduce the impact of bushfire on our community.

Although there is no magic solution that can be applied to prevent all deviant behaviours in society, as there will always be some people who choose to light bushfires and there will always be some people who are simply careless or negligent in their use of heat and fire, several complementary approaches are available to reduce bushfire occurrences. By having a greater understanding of the distribution of bushfires in our community and factors that lead people to the choice of starting bushfires we have a solid foundation for working on ways of stopping them. Fire services, land managers, police services and correctional agencies can draw on a greater understanding of motives to develop prevention and education programs, inform investigations and respond appropriately to offenders who are caught. With appropriate evidence-based prevention and treatment programs and the further building of skilled and resourced investigators, it is reasonable to expect that reduction in bushfire arson is possible. When deliberately lit bushfires present such a threat to the safety of our communities, this is a goal certainly worth pursuing.

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