Title: Firefighting the 'paradox of place' – the risks and dilemmas associated with knowing the place of fire

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Abstract

This research investigates the relationship between firefighters and landscape, and considers how ideas about the location of a fire can affect firework. In 2012, interviews were conducted with 68 Australian bushfire firefighters from selected agencies and volunteer brigades in contrasting localities: the north-east coast of Tasmania, the urban-rural interface of Canberra, and the grazing farmlands of western Victoria. Stories of fire events and the various roles undertaken were analysed. What emerged is how the 'place' of fire can be a paradox for firefighting and this can play out in several ways. Firefighters attending a fire in their local area would seem a safer proposal, then when deployed to a distant fire, surrounded by many unknowns. However, local fire crews will arrive first on scene and despite knowing the landscape must resist taking more risks in defence of their place. Instead, they must work toward a structured order of firefighting. The fire further afield has many potential hazards for deployed firefighters because they do not have local knowledge, yet, the fire will be burning for hours or days and the command structure will be set up by the time the non-local firefighters arrive. The 'paradox of place' is where the local fire can at times be more hazardous for local firefighters because of their 'local knowing' of place. In contrast, proceeding cautiously at a distant fire, can make for safer firework. The involvement of both local and deployed firefighters at any fire, must strive to find the 'right balance' of local knowledge, adaptive decision-making and risk, whilst operating safely within the structure and rules of firework. This is one of our findings associated with aspects of firefighting and place, which indicates the complexity inherent in the concept of local knowledge.

Introduction

Historically there appears a progression from the days of local brigades and local firefighting, to contemporary deployment of firefighters across regions, borders and even oceans. During the nineteenth century in Australia, brigades of volunteer firefighters established at the local level, as farmers banded to protect their patch and gold mining communities sought to defend their newly created towns (Murray and White 1995). Since the late 1990s firefighters from, for example, New Zealand and North America, and fire trucks from interstate and volunteers from everywhere attend large-scale fires in Australia. This is part of the 'surge capacity' (Kelen and McCarthy 2006) where all available resources are deployed in response to an emergency or disaster. Most obviously, there will be people deployed in the field who do not come from the landscapes in which they are fighting the fire (Gill 2005).

We initially speculated that this migratory response challenged the value of local knowledge (Pyne 2006) and the meaning of knowing the physical and social 'lie of the land' for firefighters. We wondered about the implications for firefighters' adaptive response (Gibson and Tarrant 2010) in firework. We envisaged the deployment of firefighters to distant areas surrounded by many unknowns as the 'stone in the firefighter's boot', striving to adjust to a new set of fire conditions and hazards in unfamiliar terrain. In this paper, we present a range of the dilemmas experienced by firefighters, which suggests knowing the place of fire is complicated and can affect firework in many ways.

Background

The difficulty of adapting to a unique set of circumstances – every fire is different – makes it complex and challenging to not only carry out firework but to understand the landscape in which firefighters encounter the fire (Weick 2002). The initial training undertaken by all personnel involved in Australian bushfire response provides a foundation for understanding operations, equipment, safety protocols and fire behaviour. However, firefighters can encounter vastly different landscapes and may lack local knowledge of particular landscape types. For example, they may be from a place where the dominant landscape is grassland plains, and deployed to an area where there is forest and hilly terrain. This diversity emphasises the importance of (the now institutionalised) reliance on paramilitary type training that is intended to provide cues (Whiteman and Cooper 2011) for fire response behaviour across multiple landscapes and terrains.

Firefighters responding at the nexus of the bushfire and landscape must quickly take on board information about the site, its bush, fire, and people; as well as about their peers involved in the fire response at the place of fire. However, information without meaning is not knowledge, and firefighters must integrate information (Wenger 1998) and give it meaning in order to act adaptively. Furthermore, this adaptive firework can only operate in a command structure that at times provides the flexibility for firefighters who have the experience to step outside a tightly ordered system (Perrow1999) and make appropriate decisions for the fire attack. Here lies a major dilemma; the required experience on the part of the firefighter, to know when to act adaptively or to stay within the hierarchal response to the fire. The structure may not account for variations associated with being on the spot and needing to make relevant decisions, some of which may be due to the individual's knowledge of place.

Desmond (2011) argues that what occurs during a fire event demands a unified response and adherence to the rules. When things go wrong such as a serious accident or fatal injury, it is likely the fire authority/agency will find the individual or team has worked outside the standard operating orders. Desmond finds it is almost impossible for firefighters to stay within the rules at all times during a fire, in this way, responsibility lies with the firefighter and not the organisation.

We first assumed local knowledge would be important for fighting fire and wondered about its role and any tensions between the structured attack versus the intuitive or 'local knowing' of place. Every firefighter brings their own experience, opinions and values but these must sit within the rules (Kaufman 1960) and strategies of firefighting. We set out to ask firefighters about their experience in relation to local knowledge of place and their interaction with fire.

Methods

For this study, we asked how firefighters understand and relate to place, and how the locality of a fire affects their firework. We sort to include a representative sample of firefighters (Holstein and Gubrium 1995, p.74), from locations with different fire management agencies operating in contrasting landscapes and a history of large and small fires. This allowed for comparative analysis. Guided by the fire agencies, we contacted brigades and staff and met with firefighters to outline the study and invite participation. The areas were:

- the coastal area and forested hinterland with small and regional townships of north-east Tasmania (18 firefighters);
- the urban rural fringe of Australia's capital city, Canberra, in the Australian Capital Territory (ACT) surrounded by grasslands, and mountainous bushland, forest, (18 firefighters) and;
- the undulating grasslands and farmlands with small towns and regional centres of the Wimmera and southern Mallee region of western Victoria (32 firefighters)

We incorporated mixed methods (Creswell 2009, p.25) using a semi-structured question guide and a mapping task, with individuals and groups of firefighters. The use of open questions encourages the interviewee/s to tell their stories (their narrative). We investigated themes associated with landscape, local knowledge, hazards and decision-making. We also outlined a scenario of a local fire with deployed firefighters coming to assist. Interviewees considered the important features to relay about their landscape and using this information, constructed their' mud map'

Pilot interviews were conducted between September and December 2011 with five firefighters, and the major study involved a further 63 firefighters and ran between March and August 2012. The 32 interviews comprised 21 individual and 11 group interviews. We intentionally kept the size of each group small (~4) to allow for shared discussion (Krueger and Casey 2000). A group interview is an appropriate method, as firefighters operate in groups in their firework (Haski-Leventhal and McLeigh 2010). However, we provided the option for individual or group interviews, noting the challenges of particular fire events that might make it difficult for some firefighters to discuss. This study largely focussed on volunteer firefighters (48); although we did include eight career firefighters and 12 seasonal firefighters (staff within a government department, who participate in fire duties). The whole

study included 13 females (19%) and this reflects the national ratio for the estimated female participation in brigades at 17 percent (Birch 2001, p. 31).The lead author transcribed all interviews verbatim. The interview times averaged 70 minutes for individuals and group interviews were approximately 100 minutes. The interview data was organised using spreadsheets and QSR NVivo10 software. Transcripts were coded by topic and then analytically coded (Richards 2009 p. 96). Key ideas and underlying meanings were identified in this process.

Findings

All firefighters named in this paper are ascribed a pseudonym. The following excerpts from the interviews, unless otherwise stated, reflect the majority of what firefighters described, and what we have termed, 'paradox of place'.

Fighting at the local fire place

The hazards associated with attending a fire can be a matter of timing. When a fire breaks out, the local volunteer brigade will likely be first on scene. The pressure upon the first responders to control the fire is high.

> "Because you are first responder, your adrenalin is up, you are a bit more pumped up ... So, your thought processes are different for the first response. When you go away, the fire may not be any different, but you don't have that adrenalin rush, right, you are going there in an orderly fashion, and you get a briefing and told you are going to go and do this" [Barry, volunteer Victoria].

The local brigade attending a fire in their patch, experiences a level of trepidation entering the fire ground, to bring the fire under control. In 'ideal conditions'—dry, hot, windy— a fire can quickly become disastrous and create a period of chaos before order, as Charles described:

> "I think it seems the bigger the fire the more chaos actually, not saying it is bad but because what happens is the normal brigade responds and they say they need assistance. And, so they might bring in the neighbouring brigade and it sort of, just keeps building from there as the fire changes and it gets bigger, gets away, or the wind changes. I was probably critical first up that it was so *ad hoc* but since then I have been on a couple more and I don't think there is really any other way to staff it first up." [Charles, volunteer Tasmania]

This period of 'initial chaos', Charles suggested has to happen. This *ad hoc* approach can be understood as adapting to new conditions until the command structure resolves the 'unknowns' to establish a 'known' ordered practice. Garry corroborated the danger in the early stages of a fire, he described as the "s*** fight stage". However, if the structure is not set up within reasonable time, this makes following orders very difficult. "...if you arrive two hours into it, and there are guys and no one in control and no clear lines, and if they start saying 'you are going down there', I think 'no way'!" [Garry, seasonal ACT]. Gary has considered 'order begets safety', however; this conflict situation could further compound problems at the fireground.

Another firefighter described that even small local fires can go 'pear-shaped', unless someone takes command at the fireline: "...someone has got to take charge of that incident, like straight away or it just gets higgledy piggledy" [Ryan, volunteer Victoria]. The organised attack and structure is what the local or deployed firefighter relies upon to assist their firework. Their sense of security, to operate in a 'known place' incorporates local knowledge and the structured attack which reflects a marrying of place and ordered firework, at least in the early stages of a fire. The initial order at the fireground is reliant upon one of the local firefighters quickly taking charge because they know the area. However, if the fire grows beyond his or her capability then hand-over to a more experienced leader (not necessarily local) should occur.

In the rush to contain an outbreak, first responding crews wrestle with attacking the fire or waiting for an ordered command, as one firefighter described his experience at a rapidly escalating fire. "...there were a few mistakes, like I was on the [brigade] tanker and you got in there and it was fairly chaotic at the time, but you got left to your own devices and we sort of freelanced around the fire instead of being called into a Strike Team and all stuck together" [Cameron, volunteer Victoria]. During this high fire danger day, the brigades rushed to the scene and with little time to establish order, commenced attack, 'freelancing' in protection of their township. Fortunately, the fire attack fell into order and the fire was contained. The concept of 'freelancing' was raised by another firefighter, deployed to a major fire. Firefighter Rowan [career Tasmania] described the challenge of assigning crews to stay and protect a bridge, when local brigades wanted to continue direct attack. This points to a tension between the 'local knowing' associated with the urge to defend a particular place and the broader strategic requirements of fighting fire.

Negotiating the faraway fire place

Deployed firefighters usually reach a fire some hours or days into the fire, when the firework is routine and ordered. "... like you are travelling a reasonable distance before you get there, you have got time to think about it and hopefully when you do get there that they have got a local or someone with a bit of knowledge to be able to show you"[Wayne, volunteer Victoria]. The likely duties for the deployed firefighter include, 'mopping up', back burning and logistical support. "We knew we only had to protect and blacken out, so the unknown fear isn't there" [Darren, volunteer Tasmania]. The fire agencies recognise the limitations of firefighters not knowing the place, and assign deployed firefighters to 'safer areas', and generally not in direct fire attack.

The deployed firefighter relies on fire updates, opportunities for reconnaissance of the area, and local firefighters and their knowledge of place. However, Adam discovered when deployed to the USA, it is not always firefighters who provide essential information.

> "... there were a couple of bear researchers that I got as my guides first time around. They knew their way around. They didn't know much about fire behaviour, but they knew who was who" [Adam, career Victoria].

A number of firefighters described how with experience you become perceptive about who can assist and who holds critical information about an area. "The two dozer drivers out working with us, they were local blokes and they were able to provide us with a lot of information and it was handy" [Barry, CFA Victoria]. At the fireground with hundreds,

sometimes thousands of people, all going about their business, it is not always apparent who the knowledge bearers are.

> "So you very quickly work out who, who the people are that are experienced, and sometimes they are not the staff that work for the wildfire management branch, sometimes they are the contractors. ... generally it is conversations, you start to talk to people and you watch how others interact" [Shane, seasonal ACT].

On the flipside, a firefighter must learn how to discern who is not so useful. "I have seen that where old Joe has been around for 30 years he knows what he is on about, well maybe old Joe doesn't quite know, he just happens to be around for a while" [Liam, seasonal ACT]. Deployed firefighters look to build their understanding of place, and local people can be one way of developing this knowledge. Furthermore, judgement is required, and experience helps firefighters (Lewis et al. 2011) to consider or find reliable sources of information.

Other techniques described by deployed firefighters are about 'making time', slowing the process of the urgency of response, wherever practical.

> "You have to take a step back and put the fire on hold, until you can put a handle on your resources and what you've got, where the hell are they all [crews]. But if you let it get at you, well you can go into panic mode..." [Evan, volunteer Tasmania].

Harry reiterates Evan's experience: "Take a step back, take a look at it and get things under control, which is not easy at times" [Harry, Volunteer Tasmania]. The pressure to respond quickly, straddles the need to operate safely and find the time required to assess all conditions at the fireground. This can mean the firefighter in-charge must push back against the expectation of crews of firefighters ready for action, as Jake explained:

> "Once you hold that rank, you think these people's lives and safety is really in my hands. I do what I tell them to do and if make a bad decision I could really hurt them, so sometimes I am very cautious ... I can see why people in the past were reluctant to let me go off [freelance] and do what I wanted, because they were being cautious to protect me. At the time, I did not appreciate it. When you have that responsibility for others then it really dawns on you, how big it is and now I understand why. I am far more cautious then I use to be" [Jake, volunteer ACT].

Firefighters attending fires over-time, build their technical skills and adroitness to consider both the physical and the human factors of firefighting. A firefighter's adaptiveness at the fireground, adjusting to working with new personnel, finding reliable sources of local knowledge and 'making time' are all part of the skills and aptitude of fighting fires in any location.

Conclusion

In conclusion, we move from fighting fires in unfamiliar surrounds as the 'stone in the firefighter's boot', where firework is hampered to some degree by operating in a new area; to finding other stumbling stones at play, when firefighters defend their own patch. Local firefighters as first responders, tasked with direct fire attack, enter a most hazardous period, not the least because the command structure may not be set. In catastrophic conditions the

dangers amplify, as local firefighters negotiate the fire, 'freelance' in defence of their place with a heightened awareness and 'local knowing' of likely impacts. Whereas, firefighters sent to a distant fire, arrive hours or days later and while the fire may still be unruly, fighting strategies will be in order. Deployed firefighters focused on foreign surrounds, learn to adjust to new circumstances, to seek out the 'right locals', resist urgency and 'make time' to assist their firework. Furthermore, most deployed firefighters are assigned safer tasks away from the fire front. We find the 'paradox of place' can affect all types of firefighters (volunteer, seasonal or career), where at times the nearer the fire the riskier the fire fight, in contrast, a fire further afield can make for safer firework.

The 'local knowing' of the social and cultural aspects of place is not separate to the physical business of firefighting. This response to the place of fire, such as freelancing and *ad hoc* firework, particularly in the early stages of a fire, whilst appearing to operate outside the structured order of firefighting, can allow the firefighter to be much more adaptive. However, it requires the command structure to have confidence in a firefighter's local knowledge and judgement to operate adaptively and spontaneously. This adaptive response suits the ever-changing nature of fire, but this approach must still abide the rule of self-preservation and the safety of other firefighters. Firefighting at local or distant fires depends on local knowledge and this underpins the firefighter's firework – to use their own local knowledge or sought from others – in an objective way about each site of fire.

The complexity of the 'fire place' in training and deployment could consider the challenges identified in this study, to find the poise between local knowledge, adaptive response and risk, which can operate safely within the structure of firefighting. In addition, fire management could check issues of local firefighters arriving ahead of 'order' and the pressure to 'freelance' and take risks; and to reaffirm with deployed firefighters to pace firework and to seek and ascertain reliable local knowledge. These are all steps towards fighting the 'paradox of place'.

Limitations of the study

This qualitative research has identified an issue in firefighting. These finding provide insight into practical responses that may be applicable to other localities, countries and other natural hazards where the emotional connection to place for responders exists. Further research to explore and quantify this is a management consideration in hazard response would be required.

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