How the Public Thinks About Bushfires in the Sydney Suburbs

Stentor Danielson

Draft – July 2008

Abstract

Discussions of bushfire management in Australia are usually framed as polarized. The polarization frame holds that there is a deep divide between a "localist" position calling for a traditional management regime of frequent controlled burning carried out by local people, and an "environmentalist" position calling for limits on human interference with nature. The research reported in this article examines whether that polarization accurately characterizes the views of a broad cross-section of people in one fire-prone region: the outer suburbs of Sydney, New South Wales. A Q method analysis showed that rather than a localist-environmentalist polarization, there were at least four main viewpoints -- Traditionalists, Responsible Residents, Expert Authorities, and Green Democrats -- which had significant areas of commonality among them. A mail survey examined the prevalence of these views. The results of the research suggests that for the general public, the bushfire issue is "detached," that is, not central enough to people's way of life to be shaped into detailed and action-relevant discourses. The polarization noted by other authors may be as much a product of the social context of public policy debate as it is an expression of pre-existing ideological positions.

Keywords: Bushfire, risk perception, environmental discourses, Australia, cultural theory

Australia has a long history of struggling to reconcile human lifestyles with a highly fire-prone natural environment (Pyne 1991, 2006, Collins 2006). The largely nomadic Aborigines came to a resolution (though its exact nature is disputed – see e.g. Jones 1969, Horton 1982, and for Sydney,

Clark and McLoughlin 1986), as did the similarly mobile white stockmen. Today, however, new lifestyles and settlement patterns are raising new challenges. The expanding sprawl of suburbs surrounding the nation's major cities is creating a landscape known among fire researchers and practitioners as the wildland-urban interface (WUI) and elsewhere as exurbia. There, residential settlement abuts "wild" and fire-prone land, lacking both rural areas' practical engagement with the environment and urban areas' shelter of non-flammable expanses of concrete (Bunker and Holloway 2001, Chen and McAneney 2004, Vince and others 2005). In addition, Australia is also experiencing a rise in the incidence of the hazard event itself. It is widely agreed that climate change will result in hotter, drier weather – and hence worse bushfires – in most of the country (Hennessy and others 2005, Lucas and others 2007).

Given the significance of the bushfire risk, it is unsurprising that strident debate has arisen over the best way to manage bushfires. Examining the statements of public figures in the media would suggest a polarization of viewpoints. On one side are the "localists," who believe the solution is to be found in traditional practices of frequent controlled burning by local people uninhibited by regulatory "green tape." Opposed to them are the "environmentalists," who feel that bushfire is best handled by limiting human interference with natural ecosystems (Whittaker and Mercer 2003).

Yet research in other contexts has indicated that the sharp divides between committed partisans may not accurately reflect the more diverse and ambivalent viewpoints of the wider population (Marris and others 2001). This article presents research suggesting that this is the case for the views of bushfire management held by residents of the outer suburbs of Sydney, Australia. In this population there are at least four key viewpoints, none of which corresponds to the "localist" or "environmentalist" outlook, and which share significant commonalities. The localist-environmentalist polarization may, therefore, be an outcome of the social context of public debate in a modern industralized democracy, rather than a straightforward expression of pre-existing ideological positions.

Public Debate About Bushfire in Australia

Existing research on public views of wildfire directly addressing New South Wales is scanty (though a number of projects are underway through the Bushfire Cooperative Research Centre). As Tarrant (2003) points out, stereotypes abound as participants in fire-related decision-making search for ways of making sense of the perspectives and actions of others.

The conventional wisdom about the bushfire management debate in Australia is framed by two recent histories of the country's bushfire issue: Stephen Pyne's *The Still-Burning Bush* (2006), an update to his more comprehensive *Burning Bush* (1991), and Paul Collins' *Burn* (2006). Pyne and Collins stake out opposing positions on how best to deal with bushfires. Pyne advocates active management of the environment through controlled burning, fearing that Australia is at risk of giving up the "firestick" as the United States so memorably, and disastrously, did a century earlier. Collins, on the other hand, believes that active manipulation of natural ecosystems is the culprit in Australia's present high bushfire danger, and would have his fellow citizens exercise precaution by reducing their interference with nature. Each author reads Australia's history through his own lens, coming to remarkably different evaluations of the different past periods of fire policy. (Interestingly, each author claims that traditional Aboriginal fire management resembled his preferred policy.)

Yet while Pyne and Collins disagree on what to do about bushfire, they agree on much about the structure of the debate today and historically. Both present Australian attitudes toward fire management as following a cycle of positive and negative feelings toward active management, especially controlled burning. They also describe the present situation as polarized between pro- and anti-controlled-burning sides.

In this article, I refer to the family of viewpoints that Pyne represents as "localist" (see also Cheney 2003, Henderson 1999), while Collins and his fellow travelers may be labeled "environmentalists" (see also Australian Conservation Foundation 1970, Pratten 1984).

Changes in NSW's fire legislation following the major 1994 fires echoed this divide. Here the debate was framed as an opposition between centralized coordination versus a reliance on local control and knowledge (Debus 1997). Critics of the new law, which established a state-wide Rural Fire Service, were concerned about its effects on the volunteer ethos that undergirds "localist" Australian fire management (Woods 2000). Further amendments following the 2001 fires focused on eliminating "green tape" resulting from environmental bureaucracy, passing control over environmental issues back down to the local level.

The cultural hypothesis in risk perception studies would suggest that the localist-environmentalist polarization is deeply rooted in Australians' ways of life. In its most general form, the culture hypothesis claims that views of specific risks are shaped by larger cultural orientations (which may vary both within and between societies). A person's views of risk function to reflect and reinforce that person's way of life and identity (Douglas and Wildavsky 1982, Thompson 1997, Gastil and others 2005). Pyne (2006: 2) says of Australia, "... the country seems locked into a polarized politics of identity for which conflagrations provide a dramatic backdrop, so that while all the groups stand around a common fire, they have their backs to those flames, speaking each to a separate group, using the fire to animate another agenda" (see also Franklin 2006).

Study Area

Sydney is a key center of the WUI bushfire problem. In the past 20 years, the city has experienced two highly destructive fire seasons – 1993-1994 and "Black Christmas" of 2001 – as well as many more years of not-quite-catastrophic burning. Insured losses in the past decade are over $100 million, while total fire-related costs for the state (including the value of volunteers' time) run to $3-4 billion (Henri 2003).

Sydney itself is situated on the Cumberland Plain, a region once covered by open eucalyptus

forests but now largely converted to urban or agricultural land. Surrounding the city are the Hawkesbury standstone formations, steep hills home to eucalypts and heaths comprised of *Banksia*, *Hakea*, and *Acacia* (Benson and Howell 1990). Farther west, these hills rise up to form the Blue Mountains. Development in the hills and mountains has tended to follow the flat ridgetops, leaving dense vegetation in the ravines (Cunningham 1984). Large patches of bushland also remain in Royal and Ku-ring-gai Chase National Parks, which abut the city. All of this vegetation is highly prone to burn, and most of the major species have fire-related adaptations. The fire season for Sydney is spring and summer, when hot dry winds from the west can stoke major conflagrations. Today, however, much actual burning – in the form of controlled burns – occurs in the safer winter months (McLoughlin 1998).

The WUI in Sydney is growing (albeit more slowly now than in the 1990s) (Bunker and Holloway 2001). As of 2006, when this study was conducted, the Local Government Areas in the Sydney WUI were home to just under 2.5 million people, with an annual growth rate of around 1% over the past decade (Australian Bureau of Statistics 2007). Almost 10% of the addresses in the greater Sydney region are located within 130 m of the bush, and over half of all addresses in Australia's capital cities that are within 130 m of the bush are located in Sydney (Chen 2005).

The study area for this research was defined as the region between Wollongong in the south and Gosford in the north, and between the Pacific Ocean in the east and the Blue Mountains in the west – roughly the commutershed of Sydney (Burnley and Murphy 1995). The highly urbanized areas stretching from Bondi to Paramatta were excluded.

Phase 1: Q Method

Methodology

The first phase of this research employed Q Method, which uses factor analysis to correlate individuals' overall viewpoints, grouping people who share similar ways of organizing the many ideas one might have about a topic (Brown 1980, McKeown and Thomas 1988, Dryzek and Berekijian 1993, Addams and Proops 2001, Webler, Danielson, and Tuler 2007).

Q begins by assembling a "concourse," a set of all the things that people say or think about the issue at hand (Stephenson 1978). For this research, the concourse was assembled primarily from 11 open-ended background interviews with individuals knowledgeable about bushfire in New South Wales and the second case study site (not discussed further in this article) in the state of New Jersey, USA. The interview material was supplemented through a reading of the scholarly and popular literature on wildfire. From this concourse, I took a sample of 56 statements that represented the breadth and diversity of things that are said about wildfire and its management.

The basic data in Q Method is the "Q sort," a ranking by an individual of the statements. Each participant in the study was presented with a set of cards bearing the statements, and asked to sort them into a quasi-normal distribution along a scale from "most agree" (+5) to "most disagree" (-5). Each participant separately sorted two slightly different versions of the set of statements. In the "normative" set they were phrased as "should" statements, whereas in the "descriptive" set they were phrased as "is" statements. This allowed me to investigate both how people thought fire should be managed and how they think it actually is being managed currently.

The Q sorts were analyzed using the free PQMethod program (Schmolck 2002), applying Principal Components Analysis and Varimax rotation. Each resulting factor represents a discourse – a shared way of thinking and speaking about an issue. Individuals whose sorts correlate highly with the factor are referred to as "loaders" on that factor. Each factor was represented by an idealized Q sort formed by averaging together the high loaders' sorts. Each idealized Q sort was then interpreted to understand the viewpoint of participants who loaded on that factor.

The number and selection of participants in a Q study is more akin to that in a qualitative

interview- or focus-group-based study than a large-n quantitative survey. Because Q is not designed to establish the prevalence of the discourses it identifies, nor to correlate the discourses with other facts about the participants, the set of participants need not be statistically representative of the population of interest. They must instead be selected to cover all of the possible perspectives. For this study, participants were identified in two ways. Four "key informants" was assembled from institutions (such as the Rural Fire Service and environmental groups) who have a professional interest in, and high engagement with, wildfire. Twenty-four "general public" participants were identified by contacting community groups such as churches throughout the study area and soliciting volunteers.

In the following discussion, references to Q statements are followed by the statement number and its rank in the factor in question – for example, "(27, +2)" means that statement 27 was ranked at +2 in this factor. The full list of statements, and their rankings by each discourse, can be found in Appendix A.

Normative Discourses

A four-factor solution was selected for the normative discourses. The factors are labeled F through I, as the letters A through E were used for the normative discourses in the New Jersey case study. There was a high degree of correlation among the factors -- Factor F correlated with Factors H and I with an r of .7, while H and I correlated with each other at an r of .6. The overarching theme that united these three discourses was a strong opposition to "libertarian" proposals. These three discourses were against allowing individuals to choose their own approach to fire safety, running a higher risk if they would personally choose to make that trade-off.

Discourse F: Traditionalists

Traditionalists see fire management as an enforced responsibility of WUI residents. Making

one's own home fire safe is critical, both for one's own protection (22, +4) and as a responsibility to the community (16, +5), and residents are expected to be aware of the fire risk (32, +2). Residents should stay in their homes during a fire to help with firefighting (33, +1) rather than evacuating (34, -4).

According to Traditionalists, residents' actions should be directed by the Rural Fire Service and the law. The authorities should be able to step in to establish building codes (15, +3), take care of violators (19, +4), regulate ignition sources (47, +5), crack down on arsonists (46, -3), and take control when a bushfire is burning (35, +2) (though they do not see a need to regulate off-road vehicles (45, -3)). Thus it's likely that any fire could be stopped (38, -2). In accordance with its controlling role, the Rural Fire Service should be apolitical (37, +4) and trustworthy (36, +3). However, residents cannot just rely on the RFS to take care of everything (42, -1). Traditionalists are comparatively indifferent to centralization (23, -1), while emphasizing the need for management to be sensitive to local conditions (52, +2). They would like the Rural Fire Service to keep them informed (20, +2), and are vehemently opposed to media sensationalism (2, -5).

The importance of active management to loaders on this factor is shown by their view that responsible controlled burning should be protected from lawsuits (9, +3) and is unlikely to escape from control (10, -4), as well as their desire for management plans for wild areas (51, +3). They would not trust farming and logging to reduce the danger by themselves (13, -3), nor would they allow nature to simply take its course (40, -2). Science takes a back seat to common sense in the Traditionalist view, because while science is likely to figure out how bushfires work (6, -2), it's not critical to base fire policy on that science (7, +1). They don't think residents need to evaluate scientific information for themselves (5, -2) and don't make educational programs a prioity (3, 0).

Traditionalists' view that residents should be compliant is reinforced by their opposition to libertarian and participatory ideas. Loaders on this factor were the least inclined to involve all stakeholders in decision-making (44, -2), and place little importance on the Rural Fire Service learning

from laypeople (4, 0). Individuals should not be able to exercise their own choice to de-prioritize fire safety (14, -2; 17, -3; 18, -5; 21, -4). The more macro-scale question of the location of homes is also not left up to the free market (29, -5).

Discourse G: Responsible Residents

Discourse G sees the responsibility of residents as central. Loaders on this factor believe that individuals should take care of their own homes (22, +4), and place high importance on avoiding unplanned anthropogenic ignitions (47, +4; 48, +3). Complete control by the Rural Fire Service (35, -2) and centralization of fire management (23, -3) are rejected in favor of a trusting relationship between firefighters and residents (36, +5). They have little patience for arsonists (46, -3) or people who get distracted from fire safety by other concerns (14, -4; 18, -2) (even if it requires some tradeoffs (17, -1)).

Information is important for Responsible Residents. They believe it's important for the Rural Fire Service to listen to residents (4, +3) and let them evaluate the science for themselves (5, +2), while also conducting educational programs (3, +2) and keeping residents informed of their activities (20, +2). They aren't opposed to a little media sensationalism in order to get people's attention (22, +2).

Responsible Residents believe in protecting the environment (55, +4), for example though detailed management plans for wild areas (51, +3), since it's not at odds with human safety (56, +2). But unlike what one would expect from an environmentalist perspective, they reject following Aboriginal traditions (8, -3) as well as the ideas of burning in small patches (28, -3), letting nature take its course (40, -2) and protecting some parts of the environment from fire (27, -4). They show concern for using fire responsibly, believing that controlled burning should be done only under the safest conditions (11, +5) and leaning toward a strict liability rather than negligence standard for those who conduct the burns (9, -4) – but they vehemently reject limiting the use of controlled burns out of a fear of escaped fire (10, -5).

Unlike the other normative discourses, Responsible Residents do not define themselves by their

opposition to libertarian ideas. Loaders on this factor were the only ones not to reject allowing property owners to make their own decisions about costs and benefits (21, 0), had the mildest disapproval of allowing people to build houses wherever they want (29, -2), and were the least enthusiastic about fire-safe building codes (15, -1) and restrictions on off-road vehicles (45, -4). They prefer to focus risk reducing activities on the areas closest to homes (25, +2) out of a concern for protecting life (53, +5) rather than property (54, 0). So once a fire breaks out, Responsible Residents are strongly disposed to evacuate rather than staying behind to protect their homes (33, -5; 34, +3). They also don't expect new residents to understand the fire risk right away (32, -2) (recall here that they favor ongoing educational programs).

Discourse H: Expert Authorities

Expert Authorities favor a more technocratic style of management. Loaders on this factor are by far the most supportive of giving the Rural Fire Service control during a fire (35, +5), were the only ones to even moderately favor centralization of fire management (23, +2), and think it's important for the state to be generous in funding fire protection (43, +2). Detailed management plans (51, +5) are important, and must be tailored to local conditions (24, +3; 52, +4). This discourse emphasizes protecting human life (53, +5) while showing less concern for property (54, +1) or the environment (55, 0).

Loaders on this discourse see science (6, -2; 7, +4), not politics (37, +2), as the basis for planning, and advocate extensive collection of data to judge the success of fire management (49, +3). The authorities should be willing to educate and inform the public (3, +4; 20, +3), but lay knowledge is not valued (4, 0; 44, 0), and the media is warned not to engage in sensationalism (2, -3). This confidence in science comes with a manipulative attitude toward nature, as mimicking the natural fire regime (12, -2) and letting nature take its course (40, -3) are rejected, as are learning from Aboriginal fire practices (8, -4) or farmers and loggers (13, -5). Expert Authorities see little to worry about from

off-road vehicles (45, -4), and escaped controlled burns (10, -3).

Laypeople's role is played down by Expert Authorities, though residents are expected to keep their homes fire safe for the sake of the community (16, +3) as well as their own protection (22, +2). Residents should trust the Rural Fire Service (36, +2), though they can't rely on them for everything (42, -1). Residents are not trusted to avoid accidental ignitions (48, -3) or to help defend their homes when a fire is near (33, -2) (though they do not emphasize evacuation as an important strategy either (34, -1)). This discourse also rejects allowing residents to make their own risk tradeoffs (14, -2; 18, -2; 21, -4) or build houses wherever they want (29, -5). While many of the direct behavioral regulations favored by the Traditionalists are not emphasized by the Expert Authorities, they do believe in building codes (15, +2) and cracking down on arsonists (46, -5).

Discourse I: Green Democrats

Discourse I is characterized by environmentalist and democratic sentiments. Loaders on this factor are the only people to agree with involving all stakeholders in decision-making (44, +3). They lean against giving the Rural Fire Service control of the situation during a fire (35, -1) and reject centralization (23, -4). Instead, they want the RFS to hold educational programs (3, +3) and listen to residents' knowledge and perspective (4, +3), and they advocate trust between the RFS and the public (36, +2). Green Democrats clearly want the public to participate in collective fire management. They vehemently reject libertarian notions of the public being able to do as it pleases (14, -5; 17, -3; 18, -4; 21, -3; 29, -5), and are not so keen on the market-based solution of differential insurance premiums (1, -2). And rather than relying on the Rural Fire Service to save them (42, -2), people should see fire safety as a community responsibility (61, +5) as well as an individual one (22, +4).

Protecting the environment is, for this group, only slightly less important than protecting human life (53, +5; 55, +5), and they do not believe the two goals are usually at odds (56, +2). They emphasize the importance of good management plans for wild areas (51, +4), which are tailored to local

conditions (52, +2). Unlike the other discourses, they very mildly favor excluding fire from some parts of the environment (27, +1), and believe controlled burning should mimic the natural fire regime (12, +2) – though they would not achieve this by simply letting nature take its course (40 ,-2) or relying on existing farming and logging practices (13, -2). Green Democrats' perspective is a science-based one, favoring using the best science (7, +4) and extensive monitoring (49, +3) while rejecting the idea that science will never understand bushfires (6, -2). Media sensationalism is therefore anathema (2, -5).

To Green Democrats some level of risk is unavoidable (30, +2), though careless ignitions should still be restricted (47, +2) and arson should be stopped (46, -3). Green Democrats are not very worried about off-road vehicles (45, -2) or escaped controlled burns (10, -4). They do not favor evacuation during a fire (34, -3), though the "stay and defend" policy does not occupy a prominent place in their conception of good fire management (33, 0).

In the interests of disclosure of authorial bias, I completed a normative Q sort prior to conducting this study. When comparing my sort to the idealized sorts representing the four discourses, my own sort correlated most highly, albeit still modestly, with the Green Democrats. This is unsurprising, as this discourse best captures the academic and practitioner enthusiasm for participatory decision-making that I share.

Descriptive Discourses

A four-factor solution was also selected for the descriptive discourses. These factors are labeled R through U, as the letters V through Z were used for the New Jersey descriptive discourses. Factors R and U correlated at an r of just over .5, while the other correlations between factors were lower.

Discourse R: Effective Firefighters

Effective Firefighters focus on good implementation of fire policies as the key to current fire

management. Loaders on this factor see human life as well-protected (53, +5) and are the most optimistic group when it comes to protection of property (54, +2), though they lack confidence in how well the environment is protected (55, -1). They believe there is still a widespread risk (26, +2), which is sensationalized in the media (2, +5), but that residents have accepted that risk (30, +3).

Effective Firefighters see the fire brigades as taking the lead, agreeing that people can and do trust the Rural Fire Service (36, +4; 42, +3) and that fire management is centralized (23, +3), while being the group least inclined to see fire management as political (37, +1). Loaders on this factor do not believe a broad group of stakeholders is involved in decision-making (44, -3). Ignitions are under control, as there are restrictions on fire-starting activities (47, +5), off-road vehicles are not a problem (45, -4), and arson, while a problem, is not seen to be as big an issue as the other discourses would claim (46, +2). They are the most optimistic discourse about how quickly unplanned fires are suppressed (39, +1). Controlled burning is mostly kept under control (10, -2), done in small patches (28, +2), protected from lawsuits (9, +2), and applied to the whole landscape (27, -2), though this strategy is not particularly based on Aboriginal practices (8, -2). Effective Firefighters say that risk reduction focuses on areas closest to homes (25, +4), and there are fire safety building codes (15, +3), though they may not be enforced directly (19, -2).

Effective Firefighters have mixed reviews of the efforts of homeowners, characterizing them as putting little effort into making their homes fire-safe (16, -2; 22, -3) and failing to understand the fire risk before moving to the area (32, -3). On the other hand, individualistic decision-making on balancing risks and costs (5, -4; 14, -2; 18, -5; 21, -4) and home building (29, -5) are uncommon, and people are somewhat responsible about ignition sources (48, +2). Differential insurance rates (1, -3) are not in place. The “stay and defend” approach is considered far more prevalent than evacuation (33, +4; 34, -5).

Discourse S: Risky Residents

Risky Residents think that fire management is, for better or worse, characterized by a comparatively salient role of the public, both in private decision-making and in policy. Loaders on this discourse are the only ones to think that all stakeholders are involved (44, +2) and that the Rural Fire Service does a good job of informing the public (20, +3), though newcomers are comparatively ignorant (32, -4). On the other hand, individual homeowners are seen as acting in their self-interest (rather than out of community responsibility) in preparing their homes (22, +5), insurance premiums don't penalize people (1, -3), and people have not adapted to the fire-prone environment (50, -3), even though fire safety is compatible with other values (17, +2; 18, -3). Risky Residents are reluctant to evacuate (34, -5), though they do not believe their neighbors are likely to stay and defend their homes (33, -2).

The authorities have implemented many policies to promote good fire management, such as restrictions on fire-starting activities (47, +5) and management plans for wild areas (51, +4) which are based on good science (7, +2). There are sanctions on unsafe homes (19, +4), limits on new development (29, -5), and risk reduction activities focus on areas close to homes (25, +3). The Rural Fire Service is therefore trusted (36, +5). Yet fire management is inhibited by politicization (37, -5), bureaucratic barriers (41, -4), underfunding (43, -2), and the fear of lawsuits against people who have accidents while doing controlled burning (9, -2). Fire management is somewhat hands-off, as farming and logging are relied on to reduce the risk (13, +2) and nature is sometimes allowed to take its own course (40, +2). The results resemble neither Aboriginal practices (8, -2) nor the natural fire regime (12, -2).

Risky Residents have a relatively pessimistic appraisal of the success of current fire management, being the only group to agree that a bad fire cannot be stopped (38, +3). They feel that property and the environment are poorly protected (54, -3; 55, -2), though human life is moderately well protected (53, +2). Arson is seen as common (46, +4), controlled burns occasionally escape (10, +1), and media sensationalism is rampant (2, +3), though off-road vehicles are not a problem (45, -4).

It is interesting to note that the participants who loaded on the Risky Residents factor in their descriptive sorts were split between being Traditionalists and Green Democrats in their normative sorts. They would thus suggest two divergent views for the best way to improve the situation – on the one hand better enforcement of residents' fire safety practices, and on the other more effective planning and involvement of the public.

Discourse T: Equal-Opportunity Skeptics

Equal-Opportunity Skeptics are decidedly pessimistic, finding high risks to follow from problems with both the Rural Fire Service and laypeople. In their view arson is common (46, +5) and controlled burns often escape from control (10, +5). A bad fire could strike anywhere (26, +3), and the danger is sensationalized in the media (2, +3). Interestingly, they believe that bad fires can be controlled (38, -2) – the question is whether they actually are controlled. As with the Risky Residents, this group is not very confident that human life (53, +2), and especially property (54, 0) and the environment (55, -1), are being protected. People in this region have little choice but to accept some level of risk (30, +4) and adapt their lifestyle to the threat of fire (50, +2).

The failure of the fire management establishment is highlighted by the Equal-Opportunity Skeptics. They have comparatively low confidence in the Rural Fire Service (42, +1), believing that they do not have control during fires (35, -2) and are underfunded (43, -2) and politicized (37, -5) – though there is trust between firefighters and the public (36, +2). Management plans are missing (51, -2) and home fire safety is not enforced by the authorities (19, -5) or insurance companies (1, -3), though there are restrictions on activities that could start fires (47, +5). The public, meanwhile, is not consulted by the Rural Fire Service (4, -3; 44, -4; 20, -1). As science is uncertain (6, +1) and not used in fire policy (7, -1), it's unsurprising that scientific information is not readily available to the public (5, -4). Fire policy is not based on Aboriginal traditions (8, -5) or letting nature take its course (40, -2), but rather is focused on risk reduction close to homes (25, +4), in part via controlled burning in small

patches (28, +4) and by farming and logging (13, +3).

Loaders on this factor are the only ones not to reject the idea that homeowners generally follow libertarian practices (21, +1; 29, 0). One's neighbors cannot be relied on to help one stay safe from fires (22, +3). "Stay and defend" is clearly favored (33, +2; 34, -4). Laypeople are irresponsible with ignition sources (48, -3) and don't understand their environment (32, -3).

Discourse U: Cooperative Citizens

Cooperative Citizens' view of the status quo focuses on formal policies and the actions of the Rural Fire Service, with which residents have largely complied. All in all, they believe that human life is very well protected (53, +5), but protection of property (54, 0) and the environment (55, 0) lag. There is no reason for complacency, however, since human and environmental protection need not be at odds (56, +2), and a bad fire could still strike anywhere (26, +5).

Loaders on this factor highlight the trustworthiness of the RFS (36, +5; 42, +4), which is in control during fires (35, +2). They see many official fire safety policies as being in effect – restrictions on fire-starting activities (47, +4), detailed management plans (51, +3) tailored to the local situation (52, +2), and building codes (15, +3). Fire safety measures focus on areas near homes (25, +2). In this view, controlled burning stays controlled (10, -4), since even a really bad fire could be controlled (38, -5). Such official action is useful because farming and logging are not viewed as fire-safe practices (13, -4). On the other hand, they are less confident that unplanned fires are quickly suppressed (39, -2), and funding for fire management is adequate (43, -2).

Cooperative Citizens' evaluation of the public's efforts is mixed, though in general they see residents as taking more responsibility than the Effective Firefighters do. People have other priorities (14, +3), but since fire safety is not at odds with them (17, +3), they can – with guidance from the Rural Fire Service – fulfill their responsibility to the community (16, +2). Individuals are not seen as having the responsibility of balancing costs and benefits on their own (18, -5; 21, -3) or living wherever they

want (29, -4) (though housing developments are not restricted (31, -3)), and they have accepted a certain level of risk (30, +2). Laypeople are not involved in policymaking about fire (44, -2). Cooperative Citizens place little importance on the "stay or go" question (33, -2; 34, 0).

The principal dangers seen by this factor are arson (46, +4) and manipulative politicians (37, -3), while off-road vehicles are not a source of problems (45, -3). Neither Aboriginal traditions (8, -5) nor protecting the environment from fire (27, -3) are seen as values in current fire policy.

A Localist-Environmentalist Divide?

It is clear that the normative discourses do not match the localist-environmentalist polarization described in the existing qualitative and/or unsystematic literature on views of bushfire. No discourse agrees with the paradigm "environmentalist" desire for let-burning (40), and all are indifferent to the "localist" issue of excessive interference with fire management due to environmental bureaucracy (aka "green tape") (41). There is some disagreement about the larger themes of top-down control versus bottom-up decision-making, as well as over how much to prioritize ecological goals. But these dimensions did not resolve into a localist-environmentalist polarization -- instead, the Green Democrats were both the most bottom-up as well as the most environmentally concerned. A further issue of great importance to distinguishing the discourses, but which is overlooked in talking about localists versus environmentalists, is the question of collective planning versus private action. Collective planning (advocated by Expert Authorities and Green Democrats) refers to an interest in an overarching, big-picture strategy for dealing with bushfire. Discourses that fall on the private action side (Traditionalists and Responsible Residents), on the other hand, focus their attention on what individual households can or should be doing to prepare themselves or their own property.

The descriptive discourses also do not fit the localist-environmentalist conception. The central problematic in all four discourses is citizens' compliance with official guidance and responsible fire-

related practices. Both of the optimistic discourses emphasize the strong role of an authoritative official fire management sector. The key distinction between them is that Effective Firefighters are resigned to a larger amount of unavoidable risk while the Cooperative Citizens expect residents to follow official recommendations. In a sense, this reflects the division on the normative side between the Traditionalists and the Expert Authorities – and in fact there was a tendency for loaders on normative discourses F and H to load on descriptive discourses R and U, respectively. Interestingly, the normatively Responsible Residents also tended to be Cooperative Citizens.

The pessimistic discourses were those that saw a less salient role being played by the authorities. The Risky Residents' view reflects much of the participatory and planning focus of the Green Democrats – and indeed, the two discourses were usually found together. The descriptive pessimism of such individuals suggests that such participatory policies are incompletely realized, in their view. Equal-Opportunity Skeptics' view captures the common fear that the risk from fire is high because of rampant irresponsible individualism and bureaucratic failure. Note, however, that no discourse promoted Equal-Opportunity Skeptics' libertarian practices as normative.

In sum, the localist-environmentalist paradigm is a poor representation of how people in the Sydney region think about bushfires. This parallels the finding by Marris and others (2001) that the European general public's views of genetically modified organisms don't fit the pro-con polarization that prominent stakeholders promote.

Phase 2: Survey

Methodology

The second phase of this study involved a mail survey, sent out to a random sample of residents of the study area. Among other things, the survey aimed to establish the prevalence of the discourses.

The survey was conducted according to Dillman's Tailored Design Method (Dillman 2000), including up to four contacts with each potential respondent and a token incentive of AU$5 (worth US$3.75 at the time of the survey) included in the first survey mailing. The survey was sent to 399 respondents drawn randomly from the most recent phone books and the (3-years-out-of-date) electoral rolls for three randomly chosen parliamentary districts in the study area (Riverstone, Menai, and Blue Mountains). After subtracting bad addresses, the response rate was 56.2%, or 194 responses.

Since the survey had to fit in numerous other questions, only the normative discourses were examined in the survey. Seven distinguishing statements (statements which a discourse ranked significantly higher or lower than the other discourses did in the Q study) for each discourse (except one discourse which only had five distinguishing statements) were presented as Likert items. The survey also asked about respondents' experience with fire, general worldview, fire-safety practices, household structure, and sociodemographics.

Results

Spearman non-parametric correlations between individuals' responses to the statements in the survey and a profile of statement rankings based on the Q results were computed (Danielson forthcoming). The resulting correlation coefficients were treated as measures of individuals' level of agreement with each discourse.

Counting all respondents who scored more than .4 on a discourse as adhering to that discourse (a cutoff chosen to maximize the number of individuals loading on one and only one discourse, though other cutoffs produced similar patterns), the survey contained 37 Traditionalists, 72 Responsible Residents, 54 Expert Authorities, 46 Green Democrats, and 51 individuals who adhered to none of the four discourses. Counting each respondent as an adherent only of whichever discourse his or her responses matched most closely returned a very similar pattern. Table 1 shows the rates of adherence to

discourses. In Table 1, the cross-tabulation shows how many respondents scored at least .4 on both discourses – e.g. 17 people were both Responsible Residents and Traditionalists. The diagonal shows the number of respondents adhering only to that discourse. The final row of the table shows how many people adhered to each discourse if a person is counted as an adherent only of the discourse that they scored the highest on. An important point to note about Table 1 is the high degree of overlap among the discourses – few people were adherents of exactly one discourse. This contrasts with the Q results, in which there was only a single confounder out of 28 sorters.

[TABLE 1 ABOUT HERE]

Explanation of the discourses relies on the correlation-based scales, rather than on categorization of each individual into one discourse, since such categorization would allocate individuals to discourses they agreed with only slightly if they agreed with no other discourse more. The first step is to look at socio-demographic variables. Household size and income were unrelated to the discourses. Respondents with higher levels of formal education were more likely to be Expert Authorities (r=.250, p=.001), while Rural Fire Service members were less likely (r=-.170, p=.022). Younger respondents were more likely to be Responsible Residents (r=-.175, p=.018), as were women (p=.010). Race and religion had no effect. An individual's place of residence had no effect, though Traditionalists tended not to be renters (p=.034). Responsible Residents had been in their present residence for a shorter time than adherents of other discourses (r=-.209, p=.005), and that correlation survives when controlling for age (r=.189, p=.015). Responsible Residents also had less experience, both recent and lifetime, with fire (r=.251 and .330, p=.001 and .000). Responsible Residents generally did not live in the Blue Mountains (p=.000) or near a forest (p=.000).

Responsible Residents perceived significantly lower risk from bushfires to both their communities and their own households (r=-.346 and -.324, p=.000), but the other discourses were unrelated to perceived risk. A measure of satisfaction was computed by averaging respondents' ratings of how well human life, property, and the environment are protected at present, weighted by their

ratings of how important it is to protect each of those values. Satisfaction was not correlated with any of the discourses.

The survey asked about a series of potentially risk-reducing actions that residents might take around their homes, compiled from recommendations by the Rural Fire Service and the U.S. FireWise program: trim all trees and shrubs, and clean up other flammable material, within 10 m of your home; Trim all trees and shrubs, and clean up other flammable material, within 30 m of your home; Create an explicit emergency plan for your household in case of a bushfire; Install a sprinkler system; Talk to your neighbors about working together to make your community safer from fire; Put screens over windows, vents, eaves, and other places that embers could enter the house; Clear leaves and other debris from roof and gutters; Conduct a hazard reduction burn on your property; Plant fire-resistant plants around your home; and Replace wooden shingles with metal or tile roofing. Respondents could indicate that they had done the action, another member of their household had done the action, they intended to do the action within the next couple years, another member of their household intends to do it, their household does not intend to do it, or it is not applicable (e.g. they can't install a metal roof because their house already had one when they bought it). One-way ANOVA and pairwise post-hoc Tamhane tests showed practically no significant differences in adherence to any of the four discourses between different answers to the fire-safe actions, either individually or in terms of total actions taken.

Discussion

The picture painted by this study is more complex, and less polarized, than the localist-environmentalist dispute that is often assumed. The normative discourses are mostly concerned with establishing the respective roles of the authorities and homeowners. The descriptive discourses also fail to fit the localist-environmentalist paradigm. All of them foreground the role of the authorities in establishing standards for fire safety, with disagreements arising as to the degree to which these

standards are successfully applied. Key themes in the descriptive discourses include the degree of public outreach done by the Rural Fire Service and the degree of responsibility shown by residents.

In contrast to the findings of the Q study, the survey had difficulty matching individuals uniquely to discourses, and showed only very weak relationships between the studied variables. Part of the lack of results in the survey may be attributed to poor specification of the variables. More work is needed to develop measures of discourses about fire that can be generalized to the whole of the Sydney region.

Yet there is an alternative, deeper explanation suggested by these results: bushfires are not a highly politicized issue for the general public. This explanation can be labeled the "detachment hypothesis." People in the Sydney region do not think often enough, or deeply enough, about bushfires to have clearly-shaped views on the issue. Certainly one cannot live in Australia and remain unaware of the threat – and indeed, respondents tended to rate the risk as high. Yet it may be that for most people, that awareness does not go deep into their sense of themselves, how they live their lives, and their place in the world. Political campaigns rarely emphasize clearly divergent positions on bushfire (though former Rural Fire Service chief Phil Koperberg was elected to represent the Blue Mountains district in the national Parliament shortly after the completion of this study). Rather, bushfires are treated in a detached and pragmatic way. Certainly the issue can flare up, as happens any time there is a major fire and the subsequent Coronial Inquiry. But in between (and Sydney was "in between" at the time of this study, having had its last big fire season in 2001), interest wanes (Cortner and Gale 1990).

The culture hypothesis has had some success in explaining people's views about managing highly controversial environmental risks like climate change and nuclear power as expressions of political orientations (see also Gastil and others (2005)). But in the absence of such galvanizing controversy, the social and cultural forces that ordinarily shape viewpoints are weakened.

The detachment hypothesis is related to the theory of "constructed preferences" that has received some attention in the risk perception and environmental management literature (Payne,

Bettman, and Schkade 1999, Lichtenstein and Slovic 2006, Arvai and others 2006). The "constructed preferences" theory was developed to explain the prevalence of framing effects in many environmental management surveys, such that people's apparent preferences could be reversed by asking the question a different way. The theory argues that people often do not have preexisting preferences in their heads waiting to be elicited, but rather they construct a preference at the time of questioning based on (and potentially biased by) cues in the question framing. The detachment hypothesis goes one step farther, positing a reason why certain preferences would require construction (while others are relatively stable and resistant to framing effects). Preferences that are deeply implicated in a person's way of life would be stabilized by social and cultural requirements, while more "detached" issues would require on-the-spot construction.

The upshot of the detachment hypothesis is that most people in the Sydney region simply do not have coherent, detailed views of fire management. Obviously not every person has a merely embryonic views of bushfire, but responses from those individuals get easily lost in the noise from their neighbors'. One suggestive piece of evidence for the detachment hypothesis in the current case is the very high mean scores given to nearly all of the Q-based items – indeed, histograms in about half of the cases resemble exponential curves rather than normal curves or the bimodal distribution that would indicate disagreement. Without a clear preexisting agenda, and with the freedom to circle any number on the Likert scale without being constrained by tradeoffs, a respondent could easily find that all of the items sounded pretty good. On the other hand, the Q sorts, by forcing individuals to consider the issue as a whole and establish tradeoffs and priorities among ideas, encouraged participants to do the work of organizing their conscious thoughts about bushfires. Future research could use a variable such as Absher and others' "ipsative crystallization" (which measures how well-defined and consistent an individual's preferences are) to directly assess this issue (Absher and others 2006).

The detachment hypothesis would explain why the Q discourses failed to separate into a clear localist versus environmentalist conflict. As people become more engaged in political struggle over an

issue, the structural demands of the debating arena exert a stronger force, producing effects such as the polarization of opinions to be found among interest groups (e.g. by Whittaker and Mercer 2003). But because laypeople's views of bushfires are not highly politicized, they are freer to take different forms.

Conclusion

This study examined the views of bushfire held by residents of the wildland-urban interface around Sydney, to investigate whether the popular hypothesis of an ideological polarization between "localists" and "environmentalists" obtains. It does not. Results from the Q Method discourse analysis revealed four perspectives with much common ground and little resemblance to the localist-environmentalist theory, either in people's normative views or their descriptions of the current situation. A mail survey showed that, when people are not forced by the research instrument to construct a single coherent view, individuals freely endorsed multiple discourses. Furthermore, their views did not align with demographics, nor did they seem to influence personal behavior. I propose a "detachment hypothesis" as one explanation for these results -- because the bushfire issue is not salient enough in people's lives, they have not developed detailed, coherent, action-guiding viewpoints about it. Further research is needed to explore and confirm the detachment hypothesis. If it is validated, it has potentially important implications for cultural approaches to understanding natural hazard perception and management.

Acknowledgements

I would like to thank all of the organizations and individuals who gave interviews, completed Q sorts, or filled out surveys in the course of this research. This material is based upon work supported by the U.S. National Science Foundation under Grant No. 0526381. Any opinions, findings, and

conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of the National Science Foundation.

References

Absher JD, Vaske JJ, Bright AD, and Donnelly MP (2006) Ipsative crystallization effects on wildland fire attitude -- policy support models. Society and Natural Resources 19:381-392.

Addams H, and Proops J, eds. (2001) Social discourse and environmental policy: an application of Q methodology. Edward Elgar, Northampton, MA.

Arvai J, Gregory R, Ohlson D, Blackwell B, and Gray R (2006) Letdowns, wake-up calls, and constructed preferences: people's responses to fuel and wildfire risks. Journal of Forestry 104:173-181.

Australian Bureau of Statistics (2007) Census data. Accessed online October 26, 2007: http://www.abs.gov.au/websitedbs/d3310114.nsf/home/Census+data

Australian Conservation Foundation (1970) Bushfire control and conservation. Viewpoint Series 5. Australian Conservation Foundation, Sydney, NSW.

Benson DH and Howell, J (1990) Taken for granted: the bushland of Sydney and its suburbs. Kangaroo Press, Kenthurst, NSW.

Brown SR (1980) Political subjectivity: applications of Q methodology in political science. Yale University Press, New Haven, CT.

Bunker R and Holloway D (2001) Fringe city and contested countryside: population trends and policy developments around Sydney. Urban Frontiers Program, University of Western Sydney, Sydney, NSW. Accessed online October 26, 2007: http://www.urbanfrontiers.uws.edu.au/publications/downloads/issues/webb06.pdf

Burnley IH and Murphy PA (1995) Exurban development in Australia and the United States: through a glass darkly. Journal of Planning Education and Research 14:245-254.

Chen K (2005) Counting bushfire-prone addresses in the greater Sydney region. Symposium on Planning for Natural Hazards - How Can We Mitigate the Impacts? Wollongong, NSW. Accessed online, June 11, 2008: http://www.riskfrontiers.com/RFfrontimages/FireAUS_NSW_paper.pdf

Chen K and McAneney J (2004) Quantifying bushfire penetration into urban areas in Australia. Geophysical Research Letters 31.

Cheney P (2003) Economic rationalism, fear of litigation, and the perpetuation of disaster fires. In: Cary G, Lindenmayer D, and Dovers S (ed), Australia burning: fire ecology, policy, and management issues. CSIRO Publishing, Collingwood, VIC, pp. 150-155.

Clark SS and McLoughlin LC (1986) Historical and biological evidence for fire regimes in the Sydney region prior to the arrival of Europeans: implications for future bushland management. Australian Geographer 17:101-112.

Collins P (2006) Burn: the epic story of bushfire in Australia. Allen and Unwin, Crows Nest, NSW.

Cortner HJ and Gale RD (1990) People, fire, and wildland environments. Population and Environment 11:245-257.

Cunningham CJ (1984) Recurring natural fire hazards: a case study of the Blue Mountains, New South Wales, Australia. Applied Geography 4:5-27.

Danielson S (forthcoming) Q method and surveys: Three ways to combine Q and R. Field Methods.

Debus, B (1997) Speech before NSW Legislative Assembly. NSW Legislative Assembly Hansard Article No.52 of 28/05/1997. Accessed online, October 26, 2007: http://www.parliament.nsw.gov.au/prod/PARLMENT/hansArt.nsf/V3Key/LA19970528052

Douglas M and Wildavsky A (1982) Risk and culture: an essay on the selection of technical and environmental dangers. University of California Press, Berkeley.

Dryzek JS and Berejikian J (1993) Reconstructive democratic theory. American Political Science Review 87:48-60.

Franklin A (2006) Burning cities: a posthumanist accuont of Australians and eucalypts. Environment and Planning D: Society and Space 24:555-576.

Gastil J, Braman D, Kahan D, and Slovic P (2005) The "Wildavsky heuristic": the cultural orientation of mass political opinion. Public Law Working Paper 10, Yale Law School, New Haven, CT. Accessed online, June 11, 2008: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=834264

Henderson J (1999) Bush fire and risk management from a farmer's perspective. In: Sutton F, Keats J, Dowling J, and Doig C (ed), Bush fire management conference proceedings: protecting the environment, land, life, and property. Nature Conservation Council of New South Wales, Sydney, pp. 54-56.

Hennessy K, Lucas C, Nicholls N, Bathols J, Suppiah R, and Ricketts J (2005) Climate change impacts on fire-weather in south-east Australia. CSIRO, Canberra. Accessed online, October 26, 2007: http://www.cmar.csiro.au/e-print/open/hennessykj_2005b.pdf

Henri C 2003. Fire policy: an insurance perspective. In: Cary G, Lindenmayer D, and Dovers S (ed), Australia burning: fire ecology, policy, and management issues. CSIRO Publishing, Collingwood, VIC, pp. 162-165.

Horton DR (1982) The burning question: Aborigines, fire and Australian ecosystems. Mankind 13:237-251.

Jones R (1969) Fire-stick farming. Australian Natural History 16:224-228.

Lichtenstein S and Slovic P (ed) (2006) The construction of preference. Cambridge University Press, Cambridge.

Lucas C, Hennessy K, Mills G, and Bathols J (2007) Bushfire weather in southeast Australia: Recent trends and projected climate change impacts. Bushfire Cooperative Research Centre, Canberra. Accessed online, October 26, 2007: http://www.bushfirecrc.com/research/downloads/climate-

institute-report-september-2007.pdf

Marris C, Wynne B, Simmons P, and Weldon S (2001) Public perceptions of agricultural biotechnology in Europe. Public Perceptions of Agricultural Biotechnology in Europe Project, for the European Commission. Accessed online October 26, 2007: http://csec.lancs.ac.uk/pabe/docs/pabe_finalreport.pdf.

McLoughlin LC (1998) Season of burning in the Sydney region: the historical records compared with recent prescribed burning. Australian Journal of Ecology 23:393-404.

McKeown B and Thomas B (1988) Q methodology. Sage, Beverly Hills, CA.

Payne JW, Bettman JR, and Schkade DA (1999) Measuring constructed preferences: towards a building code. Journal of Risk and Uncertainty 19:243-270.

Pratten C (1984) Fuel reduction burning -- the policies of the New South Wales voluntary conservation movement. In: Ealey EHM (ed), Fighting fire with fire: proceedings of symposium on fuel reduction burning. Graduate School of Environmental Science, Monash University, Melbourne, pp. 91-106.

Pyne SJ (1991) Burning bush: a fire history of Australia. Henry Holt and Company, New York.

Pyne SJ (2006) The still-burning bush. Scribe, Melbourne.

Schmolck P (2002) PQMethod release 2.11 for Windows. Accessed online June 11, 2008: http://www.lrz-muenchen.de/~schmolck/qmethod/

Stephenson W (1978) Concourse theory of communication. Communication 3:21-40.

Tarrant M (2003) Policy, institutions, and the law. In: Cary G, Lindenmayer D, and Dovers S (ed) Australia burning: fire ecology, policy, and management issues. CSIRO Publishing, Collingwood, VIC, pp. 156-161.

Thompson M (1997) Security and solidarity: an anti-reductionist framework for thinking about the relationship between us and the rest of nature. Geographical Journal 163:141-149.

Vince SW, Duryea ML, Macie EA, and Hermansen LA (ed) (2005) Forests at the wildland-urban

interface: conservation and management. CRC Press, Boca Raton, FL.

Webler T, Danielson S, and Tuler SP (2007) Guidance on the use of Q method for evaluation of public involvement programs at contaminated sites. Social and Environmental Research Institute, Greenfield, MA.

Whittaker J and Mercer D (2003) The Victorian bushfires of 2002-03 and the politics of blame: a discourse analysis. Australian Geographer 35:259-287.

Woods P (2000) Bush fire management: issues for local government. In: Nature Conservation Council of New South Wales (ed) Red trucks, green futures: a conference on ecologically sustainable bush fire management. Nature Conservation Council of New South Wales, Sydney, pp. 70-73.

	F	G	H	I
F (Traditionalists)	13			
G (Responsible Residents)	17	29		
H (Expert Authorities)	15	21	23	
I (Green Democrats)	6	23	11	17
Total correlating .4 or more[a]	**37**	**72**	**54**	**46**
Total by top discourse	**35**	**67**	**52**	**33**

Table 1: Combinations of discourses adhered to with a Spearman correlation of .4 or more Diagonal contains the number of individuals adhering to that discourse alone.
a. Note that columns do not sum to total because 17 respondents adhered to three discourses, one adhered to all four, and 51 adhered to none, when adherence was measured by having a correlation of .4 or more.

Appendix A: Q Statements and Scores

Values in the tables represent the ranks of each statement in an idealized Q sort representing each discourse. Statements were sorted into a quasi-normal distribution as follows:

Value:	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5
Statements:	3	3	4	6	8	8	8	6	4	3	3

Statement	F	G	H	I
1. Insurance premiums should be higher for people whose homes are not fire safe.	-1	0	0	-2
2. The media should sensationalize bushfires a bit, in order to get people's attention.	-5	2	-3	-5
3. The Rural Fire Service should hold educational programs.	0	2	4	3
4. The Rural Fire Service should talk to residents to get their knowledge and perspective.	0	3	0	3
5. Scientific information about bushfires should be easily available, so that people can make up their own minds about the risks.	-2	2	-1	1
6. Science will never fully understand bushfires.	-2	1	-2	-2
7. Fire policy should be based on the best science available.	1	-1	4	4
8. We should learn from Aborigines how to manage fire.	1	-3	-4	0
9. People who do controlled burns responsibly should not be able to be sued if there is an accident.	3	-4	-1	-1
10. Controlled burning should be avoided because burns often escape from control.	-4	-5	-3	-4
11. Controlled burning should only be done under the safest conditions .	2	5	1	-1
12. Controlled burning should try to mimic the natural fire regime of the area.	0	0	-2	2
13. Farming, logging, and other land use can be relied on to reduce the fire danger.	-3	-2	-5	-2
14. I shouldn't be expected to spend all my time worrying about fire, because I'm busy with other things that are important to me.	-2	-4	-2	-5
15. There should be building codes that require homes to be fire-safe.	3	-2	2	0
16. People have a responsibility to the community to reduce the fire risk on their property.	5	1	3	5
17. Fire safety shouldn't come at the expense of lowering the value and beauty of my home.	-3	-1	-1	-3
18. I shouldn't have to spend so much time and money on making my home fire-safe.	-5	-2	-2	-4
19. If someone's property presents a fire risk to their neighbors, the authorities should make them fix it.	4	0	0	1
20. The Rural Fire Service should inform the public about what they're doing and why they're doing it.	2	2	3	1
21. Individual property owners should have the right to decide how to balance the risks and costs of fire safety.	-4	0	-4	-3
22. It's smart to prepare your own home and family for a fire, rather than relying on other people.	4	4	2	4

Statement	F	G	H	I
23. Fire management in this state should be centralized.	-1	-3	2	-4
24. Fire management should be coordinated at the neighborhood or town level.	0	0	3	-1
25. Measures to reduce the fire risk should focus on areas closest to people's homes.	0	2	1	1
26. Nobody in this region should assume that because of where they live, they're safe from fire.	2	0	1	-1
27. Some parts of the environment should be protected from any fires.	-1	-4	-1	1
28. Controlled burning should be done in small patches, rather than burning large areas all at once.	0	-4	0	1
29. People should be able to build houses wherever they want.	-5	-2	-5	-5
30. If you live in this area, you just have to accept a certain level of risk from fires.	-1	1	1	2
31. New housing developments should be restricted in order to reduce the fire risk.	-1	1	-1	0
32. People should understand the fire risk before moving to this region.	2	-2	0	1
33. You should stay in your house when a fire is nearby to help to save it.	1	-5	-2	0
34. When a fire is approaching, you should evacuate quickly.	-4	3	-1	-3
35. Once a fire breaks out, the Rural Fire Service should have complete command of the situation.	2	-2	5	-1
36. Trust between firefighters and the rest of the community should be encouraged.	3	5	2	2
37. Fire management should not be political.	4	-1	2	1
38. Even with the best policies and practices, it's impossible to stop a really bad fire once it's burning.	-2	-1	1	0
39. Unplanned fires should be quickly suppressed.	1	1	0	0
40. Nature should be allowed to take its course without human interference where it's feasible.	-2	-2	-3	-2
41. Bureaucratic and legal barriers that inhibit fire management should be lowered.	0	-1	1	-1
42. People should be able to rely on the Rural Fire Service to protect their home and the environment.	-1	1	-1	-2
43. The state should provide lots of money for fire management.	-1	-2	2	-1
44. All stakeholders should be involved in making decisions about local fire management.	-2	1	0	3
45. Off-road vehicles should be restricted, because they can cause fires.	-3	-5	-4	-2
46. There's no way to stop arsonists – they're just crazy.	-3	-3	-5	-3
47. During fire season, activities that might start a fire should be banned or require a permit.	5	3	1	2
48. We should be able to count on people in this region to be pretty responsible when it comes to handling things like campfires that could start a bushfire.	1	3	-3	-1
49. It's important to gather data on the condition of the land and the success of fire management.	0	0	3	3
50. People should change their lifestyles to accommodate our naturally fire-prone environment.	-1	-1	-2	0
51.Detailed fire management plans should be in place for all large wild areas, such as National Parks.	3	3	5	4
52. Fire management should be tailored to the specific local situation.	2	0	4	2

Statement	F	G	H	I
53. Protecting human life should be a priority	5	5	5	5
54. Protecting property should be a priority	1	0	1	0
55. Protecting the environment should be a priority	1	4	0	5
56. Human safety and environmental health should not be at odds in fire management	1	2	-1	2

Table A-1. Normative Q statements, with their ranks in each discourse.

Statement	R	S	T	U
1. Insurance premiums are higher for people whose homes are not fire safe.	-3	-3	-3	-1
2. The media sensationalizes bushfires.	5	3	3	-1
3. The Rural Fire Service holds good educational programs.	-1	0	-1	1
4. The Rural Fire Service talks to residents to get their knowledge and perspective.	-1	0	-3	1
5. Scientific information about bushfires is easily available, so that people can make up their own minds about the risks.	-4	-1	-4	-2
6. Scientists do not fully understand bushfires.	0	1	1	-1
7. Fire policy is based on the best science available.	-1	2	-1	1
8. Our current fire policy is based on the way Aborigines use fire.	-2	-2	-5	-5
9. People who do controlled burns responsibly cannot be sued if there is an accident.	2	-2	2	0
10. Controlled burns often escape from control.	-2	1	5	-4
11. Controlled burning is only done under the safest conditions.	1	1	1	0
12. Controlled burning mimics the natural fire regime of the area.	0	-2	-1	-1
13. Farming, logging, and other land use reduce the fire danger.	-1	2	3	-4
14. I don't spend all my time worrying about fire, because I'm busy with other things that are important to me.	-2	0	0	3
15. There are building codes that require homes to be fire-safe.	3	1	0	3
16. People recognize that they have a responsibility to the community to reduce the fire risk on their property.	-2	0	1	2
17. Fire safety can be achieved without lowering the value and beauty of my home.	1	2	1	3
18. Making my home fire-safe is too expensive and time-consuming.	-5	-3	0	-5
19. If someone's property presents a fire risk to their neighbors, the authorities will make them fix it.	-2	4	-5	-1
20. The Rural Fire Service informs the public about what they're doing and why they're doing it.	1	3	-1	0
21. Individual property owners are able to decide how to balance the risks and costs of fire safety.	-4	-1	1	-2
22. You can't rely on other people to keep you safe from fire.	-3	5	3	1
23. Fire management in this state is centralized.	3	0	1	1
24. Fire management is coordinated at the neighborhood or town level.	0	-1	-1	0
25. Measures to reduce the fire risk focus on areas closest to people's homes.	4	3	4	2
26. A major fire could strike anywhere.	2	0	3	5

Statement	R	S	T	U
27. Some parts of the environment are protected from any fires.	-2	-1	-2	-3
28. Controlled burning is done in small patches, rather than burning large areas all at once.	2	1	4	1
29. People are allowed to build houses wherever they want.	-5	-5	0	-4
30. People in this area recognize that living here brings a certain level of risk from fires.	3	1	4	2
31. New housing developments are restricted in order to reduce the fire risk.	0	-1	1	-3
32. People moving here from other places understand the fire risk.	-3	-4	-3	-1
33. Most people stay in their houses when a fire is nearby.	4	-2	2	-2
34. When a fire is approaching, I would evacuate quickly.	-5	-5	-4	0
35. Once a fire breaks out, the Rural Fire Service has complete command of the situation.	1	1	-2	2
36. There is a lot of trust between firefighters and the rest of the community.	4	5	2	5
37. Fire management is not political.	1	-5	-5	-3
38. The way fires are currently handled, it's impossible to stop a really bad fire once it's burning .	0	3	-2	-5
39. Unplanned fires are quickly suppressed.	1	-1	0	-2
40. Nature is allowed to take its course without human interference where it's feasible.	-1	2	-2	-1
41. There are few bureaucratic and legal barriers that inhibit fire management.	-1	-4	2	-1
42.People can rely on the Rural Fire Service to protect their home and the environment.	3	-1	1	4
43. The state provides lots of money for fire management.	0	-2	-2	-2
44. All stakeholders are involved in making decisions about local fire management.	-3	2	-4	-2
45. Careless use of off-road vehicles is a major cause of fires.	-4	-4	0	-3
46. Arson is a major cause of fire.	2	4	5	4
47. During fire season, activities that might start a fire are banned or require a permit.	5	5	5	4
48. People in this region are pretty responsible when it comes to handling things like campfires that could start a bushfire.	2	-1	-3	0
49. Lots of data is gathered on the condition of the land and the success of fire management.	0	0	-1	1
50. People in this area have adapted to living in a naturally fire-prone environment.	-1	-3	2	1
51. Detailed fire management plans are in place for all large wild areas, such as National Parks.	0	4	-2	3
52. Fire management is tailored to the specific local situation.	1	0	-1	2
53. Human life is well protected	5	2	2	5
54. Property is well protected	2	-3	0	0
55. The environment is well protected	-1	-2	-1	0
56. Human safety and environmental health are not at odds in fire management	1	1	0	2

Table A-2. Descriptive Q statements, with their ranks in each discourse.