

This article was downloaded by: [Charles Sturt University], [Emily Sharp]
On: 10 October 2012, At: 14:58
Publisher: Routledge
Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Journal of Environmental Planning and Management

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/cjep20>

Trust and trustworthiness: conceptual distinctions and their implications for natural resources management

Emily A. Sharp^{a b}, Rik Thwaites^a, Allan Curtis^{a b} & Joanne Millar^a

^a Institute for Land, Water and Society, Charles Sturt University, PO Box 789, Albury, 2640, NSW, Australia

^b National Centre for Groundwater Research and Training, Adelaide, South Australia

Version of record first published: 10 Oct 2012.

To cite this article: Emily A. Sharp, Rik Thwaites, Allan Curtis & Joanne Millar (2012): Trust and trustworthiness: conceptual distinctions and their implications for natural resources management, Journal of Environmental Planning and Management, DOI:10.1080/09640568.2012.717052

To link to this article: <http://dx.doi.org/10.1080/09640568.2012.717052>



PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.tandfonline.com/page/terms-and-conditions>

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae, and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings,

demand, or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

Trust and trustworthiness: conceptual distinctions and their implications for natural resources management

Emily A. Sharp^{a,b*}, Rik Thwaites^a, Allan Curtis^{a,b}, Joanne Millar^a

^aInstitute for Land, Water and Society, Charles Sturt University, PO Box 789, Albury, NSW 2640, Australia; ^bNational Centre for Groundwater Research and Training, Adelaide, South Australia

(Received 1 February 2012; final version received 26 July 2012)

Few natural resource management (NRM) studies discriminate between trust and trustworthiness. However, this approach, which combines the attitude of one actor with the characteristics of another actor, is common in the organisational management literature. Our case study, set in a wildfire management context in Australia, sought to explore: (1) how community members and NRM staff defined trust and described trustworthiness; (2) how these trust definitions did, or did not, reflect conceptualisations in the literature; and, (3) whether explicitly differentiating between trust and trustworthiness is useful in an NRM context. Our findings suggest that participants defined trust in three main ways: as 'having a good relationship'; as 'being able to rely on others' in a one-way manner; and, as 'a relationship where parties rely on one another' in a reciprocal manner. Our findings also suggest that participants differentiated these trust definitions from trustworthiness, that is, from the characteristics and actions which made an individual or agency worthy of trust. These findings suggest that it is useful to differentiate trust from trustworthiness, because it allows NRM managers and researchers to better understand both the trusting intentions of community members and the characteristics of the agency which contribute to that trust.

Keywords: trust; trustworthiness; confidence; reliance; wildland fire

1. Introduction

It is generally agreed that trust is important in building and maintaining positive relationships between natural resource management (NRM) agencies and communities impacted by management actions and plans. Relationship-building is critical, because many environmental planning processes involve considerable complexity and controversy stemming from the need to balance the multiple values and competing interests of diverse stakeholders (Treffny and Beilin 2011, LaChapelle and McCool 2012). Indeed, trust has been identified as an integral component of effective collaboration (Beunen and de Vries 2011, Cooke *et al.* 2012) and public participation processes (Davenport *et al.* 2007, Johnson and Scicchitano 2009) in NRM contexts.

Trust also has been identified as a key factor influencing the social acceptability (i.e. public support) of management strategies for a variety of issues, including endangered species policy, watershed management, carbon capture and storage, and

*Corresponding author. Email: esharp@csu.edu.au

wildfire and fuels management (Stankey and Shindler 2006, Leahy and Anderson 2008, ter Mors *et al.* 2010, Absher and Vaske 2011, Toman *et al.* 2011). Importantly, trust has been shown to diminish opposition and scepticism between communities and NRM agencies (Wondolleck and Yaffee 2000). Similarly, Shindler *et al.* (2002, p. 48) suggested that without trust, it is easy for the public to become disenfranchised and withhold support for management decisions. They argued that trust-building should be the “central, long-term goal of effective public process”.

Trust has been defined in many different ways in the NRM literature (e.g. Marshall and Jones 2005, Vogt *et al.* 2005, Toman *et al.* 2011), resulting in no consensus definition and a lack of clarity regarding conceptual distinctions between trust and trustworthiness. Even though trust and trustworthiness are distinctive constructs, researchers often make the mistake of conflating them (Hardin 2002, Mollering 2006). Confusion can arise because researchers may use the term ‘trust’ differently and thus be describing different constructs (Blomqvist 1997, McKnight and Chervany 2001). Seppanen *et al.* (2007) therefore argued that researchers should be clear about whether they are studying trustworthiness or trust. In this paper, trust refers to the attitude or intention of the trustor (i.e. person doing the trusting), and trustworthiness refers to the characteristics of the trustee (i.e. person being trusted) upon which the trustor’s intentions are built.

For NRM managers and social scientists, distinguishing between trust and trustworthiness provides a better understanding of both the intentions of community members and the characteristics of the agency which contribute to trusting relationships in collaborative NRM. Therefore, the objectives of our study were to explore: (1) how community members and NRM staff defined trust and described trustworthiness; (2) how the trust definitions did, or did not, reflect conceptualisations presented in the literature; and, (3) whether explicitly differentiating between trust and trustworthiness is useful in an NRM context.

We begin by describing the range of ways trust has been conceptualised in the NRM literature. We then present a socio-psychological conceptualisation of trust and trustworthiness that differentiates between these constructs. After describing our case study area and qualitative methods, we present definitions of trust and examples of trustworthy characteristics gathered in our research. We then discuss how participant definitions of trust were similar and different to definitions found in the literature and how recognition of the differences in trust and trustworthiness play a key role in relationships of shared responsibility, or collaboration, between community members and NRM agencies.

2. Conceptual background

2.1. Conceptualisations of trust in the NRM literature

A range of trust conceptualisations is present in the NRM literature. Siegrist and Cvetkovich’s (2000, p. 354) definition of trust as “the willingness to rely on those who have the responsibility for making decisions and taking actions” is frequently cited (e.g. Vogt *et al.* 2005, Absher and Vaske 2011). In other studies, trust is not explicitly defined, but delineated as ‘types’ of trust (e.g. Ryan and Klug 2005, Mandarano and Paulsen 2011), or described as a relational or calculative partnership (e.g. Toman *et al.* 2011, LaChapelle and McCool 2012). Others have described trust as a dispositional trait (e.g. Lokhorst *et al.* 2009) or do not define it at all, instead measuring respondents’ ‘level’ or ‘amount’ of trust in a managing agency (e.g.

Marshall and Jones 2005, Olsen and Shindler 2010). However, none of the studies conceptualising trust in these ways have explicitly considered differences in trust and trustworthiness. Finally, some studies have adopted a specific definition of trust that differentiates between trust and trustworthiness, such as the definitions provided by Rousseau *et al.* (1998) or Mayer *et al.* (1995), but do not explicitly investigate them as distinct concepts (e.g. Davenport *et al.* 2007) or do not measure them in a way that is consistent with the definition employed (e.g. Liljeblad *et al.* 2009).

2.2. Trust and trustworthiness – distinct concepts

Several organisational management researchers have attempted to clarify the conceptual confusion surrounding trust by defining it in a way that differentiates trust and trustworthiness (Mayer *et al.* 1995, Rousseau *et al.* 1998). Rousseau *et al.* (1998, p. 395) defined trust as “a psychological state comprising the intention to accept vulnerability, based upon positive expectations of the intentions or behaviour of another”. Mayer *et al.* (1995, p. 712) defined trust as “the willingness of a party to be vulnerable to the actions of another party, based on the expectation that the other party will perform a particular action important to the trustor . . .”. These definitions suggest trust has two main components. First, the willingness to accept vulnerability represents an intention to trust, a subjective decision (i.e. willingness to be vulnerable or rely on another) that is then acted upon through trusting behaviours (e.g. not monitoring agency actions). Second, these trusting intentions are based on positive beliefs or expectations (i.e. beliefs or expectations about another’s trustworthiness). Trustworthiness is a quality of the trustee (i.e. person being trusted), while trusting is something that the trustor (i.e. person doing the trusting) does (Mayer *et al.* 1995). Consequently, trust and trustworthiness are viewed as distinct, but related constructs.

2.3. Components of trust

Several authors have identified common components of trust found in conceptualisations in the literature (e.g. Rousseau *et al.* 1998, Hudson 2004, Mollering 2006). These authors suggest that most conceptualisations of trust involve dimensions of risk, vulnerability, uncertainty, expectations and interdependence, as explained below.

It is argued that for trust to arise, uncertainty and vulnerability are necessary conditions facing the trustor and trustee (Luhmann 1979, Bigley and Pearce 1998). Uncertainty relates to the limits of an individual ever having full knowledge of others, their motives and their responses to internal and external changes in situations (Gambetta 1988, p. 218). In other words, the trustor can never be absolutely sure that the trustee will fulfil his or her obligations. Trusting under such conditions of uncertainty requires taking a ‘leap of faith’ (Lewis and Weigert 1985). This ‘leap of faith’ is related to risk, that is, the potential that the trustor will experience negative outcomes (e.g. loss) if the trustee proves untrustworthy (Sitkin and Pablo 1992). Rousseau *et al.* (1998) stated that uncertainty is the source of risk, and risk creates the opportunity for trust.

Vulnerability (i.e. willingness to take on risk) is related to expectation, because it is presumed that a trustor is willing to assume vulnerability based on positive expectations that the trustee will fulfil his or her obligations within the relationship

(Mayer *et al.* 1995, Rousseau *et al.* 1998). Relationship obligations could include such things as completion of a job or achievement of a shared goal. Barber (1983) described three conditions of expectation that are important to trust. Barber stated that trustors expect: (1) the existing social order to persist, that is, institutional structures will not change and alter the basis for trust; (2) that trustees will perform competently; and, (3) that trustees will act in a ‘morally correct’ way. Finally, trusting relationships are assumed to require interdependence, a situation where the interests of at least one of the parties cannot be fulfilled without dependence on another party.

Trust, therefore, is a unique form of relationship that entails vulnerability to, and uncertainty about, another party’s actions when one or both parties are dependent on the other to fulfil its interests. Further, trust is based on positive expectations that the other party will fulfil its obligations in the relationship. It is important to note that trust would not be necessary if the other party’s intentions could be ascertained with complete certainty, or neither party had anything meaningful at stake (Kee and Knox 1970, Bigley and Pearce 1998).

2.4. Components of trustworthiness

In their seminal work, Mayer *et al.* (1995) suggested that trustworthiness comprises three characteristics, including: ability (i.e. trustor’s perception of the trustee’s knowledge, skills and competencies); benevolence (i.e. the extent to which a trustor believes that a trustee will act in the best interest of the trustor); and, integrity (i.e. the extent to which the trustor perceives the trustee as acting in accord with a set of values and norms shared with, or acceptable to, the trustor). Factor analytic studies (e.g. Mishra 1996, Poortinga and Pidgeon 2003) and a literature review (Johnson 1999) in the field of risk management have suggested that the numerous components of trustworthiness identified in that field can be reduced to three components, namely, competence, care, and honesty/openness, which mirror those identified by Mayer *et al.* (1995). Conceptualising trustworthiness as a multi-faceted construct that comprises competence and character incorporates previous work (e.g. Kee and Knox 1970, Butler 1991) and also allows for cognitive (e.g. judgements of competence) and affective (e.g. emotional heuristics regarding benevolence and integrity) perceptions suggested in other models of trust (e.g. McAllister 1995, Earle *et al.* 2007).

2.5. Confidence

Trust may also be confused with the concept of confidence. Previous research has suggested that confidence is primarily based on assessments of past performance (Dirks and Ferrin 2001, Earle *et al.* 2007) and refers to a passive acceptance that something will happen with certainty (Luhmann 1988, Blomquist 1997, Hardin 2002). What makes trust a unique concept is that it implies vulnerability, risk and uncertainty within a relationship (Rousseau *et al.* 1998, Hudson 2004). Unlike trust, confidence requires no vulnerability to the other party (Mollering 2006). Confidence does not require a relationship, just a passive acceptance that agencies will perform their jobs because they have shown their competence in doing so in the past.

Trust, on the other hand, involves an active consideration as to whether the agencies will perform their roles where there is the potential for negative outcomes

because of the agency's actions. Further, unlike confidence, this consideration rests not only on whether community members think the agency is capable of performing a job (i.e. ability), but also on whether community members perceive that the agencies will perform the action with the community's best interests at heart (i.e. benevolence) and in ways that are acceptable to the community (i.e. integrity).

3. Wildfire management context and study area

Because wildfire management involves considerable uncertainty and complexity, which are important components of trusting relationships (Gambetta 1988), it presented a highly relevant setting for our research in Victoria, Australia. Two main government bodies, the Country Fire Authority (CFA) and the Department of Sustainability and Environment (DSE), are responsible for wildfire planning, preparation and response in rural and regional Victoria. The DSE is responsible for managing fires on public land, including state forests and national parks. The CFA is responsible for managing fires on private land and is largely a volunteer organisation. At the local brigade level, CFA captains, crew members and auxiliary staff are all volunteers drawn from the local community. The CFA assists the DSE to contain fires on public land when requested. The agencies work together to manage large fires which span public-private boundaries and jointly co-ordinate the rehabilitation and repair of private assets damaged as a result of efforts to control wildfire (e.g. fencing damaged in constructing fire breaks). The state-level Department of Human Services (DHS) and local government (Shire Council) co-ordinate community fire recovery programmes and services.

In recent years, emergency management agencies in Australia have sought to build partnerships with local communities as part of a shift in policy that emphasises greater community self-reliance through 'shared responsibility' among communities, local government and managing agencies in emergency preparation, response and recovery (Prosser and Peters 2010). As part of a culture of shared responsibility, the state of Victoria adheres to a 'stay and defend or leave early' policy which is the foundation of wildfire safety education in the state. The policy advises community members to make a decision prior to the fire season to prepare, stay and defend their properties from wildfires or leave well before a fire arrives in their area. The policy is underpinned by legislation which, instead of mandating forced evacuations, grants community members the right to stay and defend their properties. People may only be removed from their properties during a fire if they do not have a pecuniary interest in the land, building or goods.

Our research focused on communities affected by wildfires in December 2006 and January 2007 in and near the King River valley in the Rural City of Wangaratta (RCOW) local government area in Victoria, Australia (Figure 1). The RCOW, located approximately 245 km northeast of the capital city of Melbourne, covers an area of approximately 3764 km² and is bounded by extensive tracts of heavily forested public land, including the Alpine National Park. The area experiences hot, dry summers and cool, wet winters; however, a decade of drought had dried out the forests considerably prior to the 2006–07 wildfires. The study area within the RCOW boundaries is approximately 1350 km² and contains small rural localities and mixed farming properties. The total population of the study area is just under 2000 (Australian Bureau of Statistics 2006).

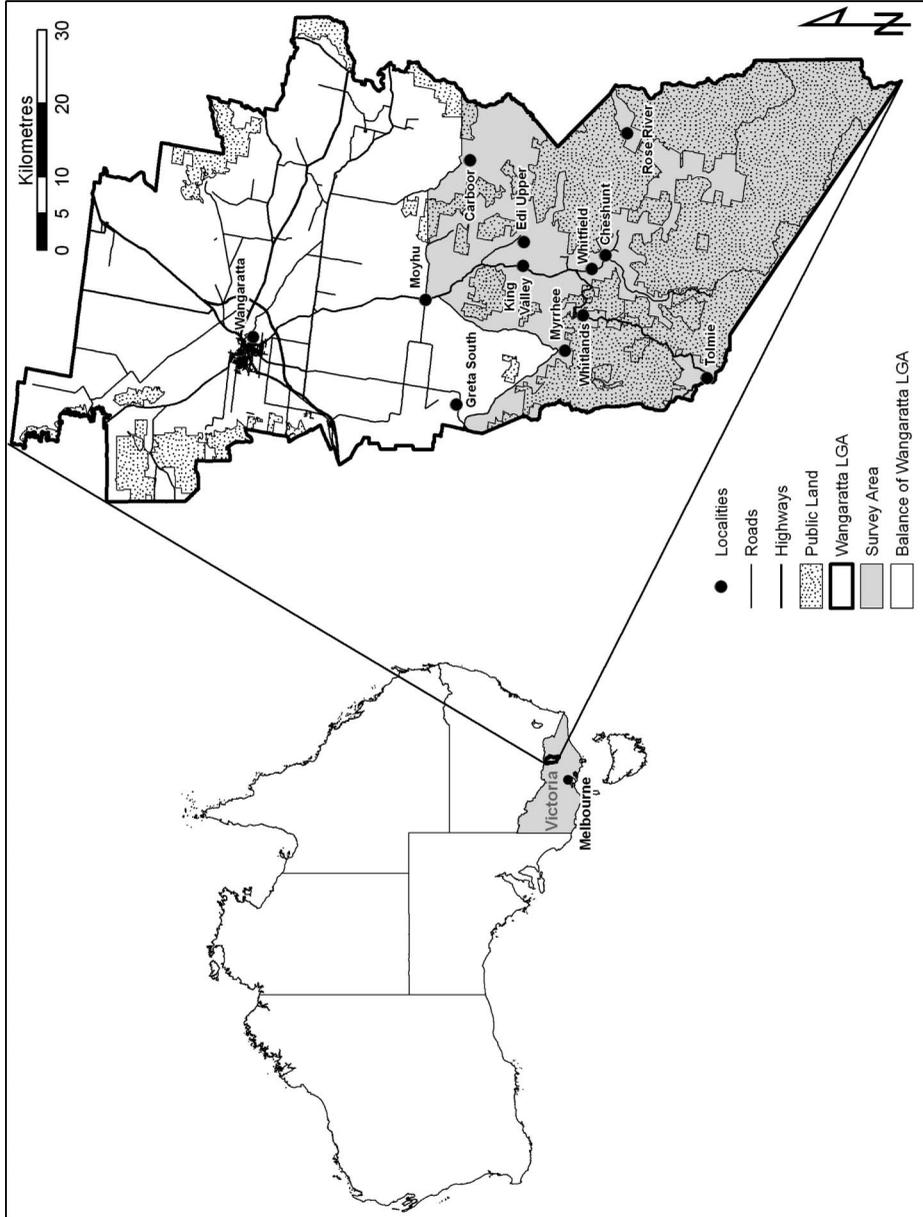


Figure 1. Location of the rural city of Wangaratta local government and case study area, Victoria, Australia.

Lightning strikes ignited two rounds of wildfires in the study area during summer, December 2006 and January 2007. The first complex of fires was active in the study area in the first three weeks of December. These fires eventually joined with others elsewhere to become the Great Divide Complex, which burnt over 1 million hectares of land in the state. The Tatong Fire began on 11 January 2007 in State Forest, burning approximately 33,000 ha, including 750 ha of plantation timber, before it was fully contained by the first week of February. Drought conditions, steep and inaccessible terrain and a lack of available resources made fire-fighting conditions difficult in both fires. Although no-one was killed and there was a minimal loss of primary residences, the fires caused substantial economic and social disruption to the communities. The local communities were on alert and repeatedly threatened by fire for most of December and January. Private pine plantation losses were estimated at over AU\$20 million and smoke taint in grapes caused the loss of the 2007 vintage locally.

4. Methods

4.1. Research approach

Semi-structured interview data for this case study were collected using a qualitative approach. A qualitative approach allowed us to capture detailed descriptions of how community members and NRM agency staff defined trust and expressed trustworthy characteristics deemed necessary for engendering community-agency trust. Knowledge of how community members and agency staff understood trust and trustworthiness allowed us to adopt a conceptualisation and definition of trust which was consistent with participant understandings.

4.2. Study participants

Between March and October 2008, we interviewed 10 regional and state level fire management agency staff, two RCOW employees and 38 wildfire-affected community members (21 males, 17 females). A total of 26 community member interview sessions (12 interviews involved couples) were held in 10 geographic locations throughout the study area. Agency and RCOW staff interviewed included personnel who were involved with the communities during the fires or with community engagement activities in general.

Community member participants were selected using purposive sampling. This sampling technique draws potential participants from relevant categories of interest, rather than on the basis of statistical frequency or distribution in the population (Bradshaw and Stratford 2005, Rubin and Rubin 2005). Participants were recruited through recommendations by RCOW's Bushfire Recovery Officer and a Community Safety staff member from CFA Regional Headquarters at Wangaratta.

In our discussions with CFA and RCOW staff, we requested participant recommendations that would represent both positive and negative experiences with resource management agencies before, during and after the fires. While this technique for gathering participants may introduce sampling bias, the agency contacts were careful to balance their recommendations to include people who had negative experiences with the managing agencies, as well as individuals with positive or mixed experiences. Several individuals who submitted personal photos and stories to a local photographic exhibition featuring images from the 06/07 fires were also

recruited. These participants generally had very intense experiences during the fires, which had led them to wanting to share their stories and photos in a public display, but they were not, overall, more trusting or distrusting of the managing agencies than other participants. To ensure we gathered a range of views, our participant sample included diversity in the following characteristics: gender; age; farm enterprises; farm size; income source (e.g. off-farm income); full-time/part-time resident; CFA/non-CFA member; length of residence in the region; amount of past experience with fire; and, amount of asset loss/damage in 06/07 fires (Table 1).

4.3. *Semi-structured interview guide*

Interview guides were developed for use in semi-structured interviews with community members and agency staff. The guide provided predetermined topics, but allowed the interviewer to build a conversation within a particular topic that was important to the participant (Patton 1990). We drew upon our literature review to develop the guide (Table 2).

We first asked participants to describe their experiences in the 2006/07 fires and any particular incidents in which their trust was increased or diminished in a specific person, agency or organisation before, during or after the fires. Participants were also asked to identify factors they regarded as critical to community-agency trust before, during and after a bushfire. If participants did not volunteer a definition of trust, at the end of the interview they were asked to explain how they understood the concept. We did this at the end of the interview so that their definitions did not influence their other responses. We also asked how this 'trust' was demonstrated by the resource management agencies, if participants had not already described this in the interview. We did not explicitly share our definitions of trust and trustworthiness with participants so that we would not influence their understanding or use of those terms. However, when discussing participant definitions of trust at the end of the interview, we shared our understandings of the terms if participants asked. Interviews typically lasted 1 to 1.5 hours, although some lasted as long as 2.5 hours.

4.4. *Analysis*

Interviews were digitally recorded and transcribed verbatim. We examined the data in three stages corresponding to our three analysis objectives. We first examined the data for information related to definitions of trust. We then examined the data for descriptions of trustworthy characteristics. Finally, we compared the two sets of data to look for similarities, differences and relationships. To examine the data, we used an iterative deductive and inductive coding process for each analysis objective (Rubin and Rubin 2005). Coding reduces the data and allows the researcher to analytically categorise the data into broader themes. We used a standard coding procedure, involving three passes through the data, which may be described as descriptive, topic and analytic coding (Richards 2005). In our first pass, we developed numerous codes directly from the data (e.g. 'promise follow-through': trustworthiness) and from our knowledge of the literature (e.g. Lewis and Weigert 1985, Mayer *et al.* 1995). In the second pass, we developed categories by looking for associations between the numerous codes (e.g. 'honesty' and 'does what they say they'd do' were codes within a 'types of integrity' category). In the third pass, categories were compared and contrasted to explore commonalities and differences

Table 1. Social characteristics of 38 community members (gathered in 26 interviews) and 12 agency staff interview participants.

	Number of community member participants		Number of agency staff participants
Gender (n = 26)		Gender (n = 12)	
Couples (1M/1F)	12		
Male	9	Male	7
Female	5	Female	5
Age (n = 38)		Age (n = 12)	
Under 65	31	<30 years	2
Over 65	7	31–50 years	6
		>50 years	4
Primary Occupation (n = 38)		Employed by this agency (n = 12)	
Agriculture	12	Local government	2
Professional	11	Country Fire Authority (CFA)	6
Trades	6	Parks Victoria/Department of Sustainability and Environment	4
Retired	4		
Other	5	Office headquarters base (n = 12)	
CFA volunteer or family member in CFA at time of 06/07 fires (n = 26)		Local	2
Yes	17	Regional	5
No	9	State	5
Had fire burn onto property during 06/07 fires (n = 26)			
Yes	16		
No	10		
Length of residence in region (n = 38)			
<1–10 years	8		
11–20 years	10		
21–30 years	6		
31–40 years	6		
>40 years	8		
Property size (n = 26)			
<40 ha	16		
>40 ha	10		
Farm enterprise type (n = 16)			
Grazing – beef or dairy	9		
Cropping or orchard or nuts	3		
Grapes/grazing	4		
Income source (n = 26)			
On-farm only	9		
Some/all off-farm	17		

Table 2. Semi-structured interview guide used with community members.

Question 1:	Please tell me about your experiences with the 06/07 fires.
Q1 Probes:	Had you experienced a bushfire before the 06/07 fires? How were your experiences in the 06/07 fires similar or different to previous fires?
Question 2:	Please describe an event before, during or after the recent fires which either strengthened or diminished your trust in a particular person, organisation or agency.
Q2 Probes:	What were the main factors that made you feel like you could/could not trust him/her/them? What other things contribute to/diminish your trust in him/her/them?
Question 3:	What do you think is most important in being able to trust others: a) before the fire; b) during the fire; and, c) after the fire?
Question 4:	Trust is a very commonly used term, but we may not all be talking about the same thing when we use the word. If you had to write a dictionary definition for how you define trust, what would that definition be?

among interviewees. Through an iterative process, the final categories were combined to derive three broad views of trust and separate lists of relatively distinct trust and trustworthy characteristics which explained the relationships between the categories and research objectives.

To ensure that the data accurately represented participant understandings, participants were sent a copy of their transcript sections which related to the research objectives. Participants were asked to review the findings and their transcript and note any discrepancies, instances that did not reflect their experience, or anything else which required clarification.

5. Findings

Our findings suggest that participants defined trust in different ways (i.e. broad, specific and combined views) (Table 3) and differentiated these views from the characteristics which made an individual or agency worthy of that trust (Table 4). For example, trust was most often defined as “having a good relationship” with agency staff and/or “being able to rely” on the agency and agency staff. Further, community member participants often described characteristics of trustworthiness when describing why they ‘relied on’ agencies or agency staff. In this section, we first describe the different ways trust was defined by our participants followed by participant descriptions of trustworthy characteristics.

Most trust definitions provided at the end of an interview were consistent with how participants had discussed trust, and the factors important to building it, during the main part of their interviews. Characteristics and actions considered trustworthy were frequently mentioned throughout most interviews. In our findings below, we identify quotes from community members as ‘CM’ and agency staff as ‘A’.

5.1. Trust definitions – broad view

Approximately 20% of participants expressed a broad view of trust, describing trust as something that is present within, or results from, a good relationship. All

participants defining trust in this way were community member participants. None of these participants, or their family members, were involved in the CFA and several struggled to provide a definition beyond a vague description of trust being ‘a good relationship’. For these individuals, trust and relationship-building between agencies and communities mirrored each other.

Trust is just part of a good relationship. You have trust when you have a good relationship with someone you know. (CM34)

However, participants holding a broad view of trust were easily able to describe actions and events which contributed to positive relationships. For example, one participant felt that building trust between community members, and between community members and fire management agencies, was enhanced through getting to know one another during community activities offered after the fire.

I suppose it was . . . building community relations and getting to know who people are in the community. You go to a community event and . . . everyone comes out of the woodwork. So that builds up trust. And to build up trust you actually need that face-to-face knowledge to get to know that person. (CM30)

Table 3. Three different views of trust illustrated by research participant definitions.

Community member trust definitions	
Broad view	Something that is present within, or results from, a positive relationship. Example: “having a good relationship”
Specific view	A particular relationship aspect related to reliability. Example: “being able to rely on someone”
Combined view	A positive relationship in which parties can rely on one another for certain actions. Example: “a type of relationship where people are true to their word”

Table 4. Participant descriptions of the characteristics shown by trustworthy individuals or agencies, classified according to the Mayer *et al.* (1995) typology of trustworthiness.

<i>Ability</i> (i.e. knowledge, skills and competencies)	<i>Benevolence</i> (i.e. the extent to which a trustor believes that a trustee will act in the best interest of the trustor)	<i>Integrity</i> (i.e. the extent to which the trustor perceives the trustee as acting in accord with a set of values and norms shared with, or acceptable to, the trustor)
Strong leadership	Reassuring in a crisis	Inclusive
Good, flexible decision-making skills	Keep residents’ best interests at heart	Keep promises/word OR ‘follow-through’
Consistent actions	Compassionate	Open-minded
Competent	Empathetic	Transparent
Knowledge	Caring	Credible
Anticipate needs	Sensitive manner	Responsive to needs
	Respectful of others’ needs, knowledge and opinions	Honest

Importantly, all participants holding a broad view of trust emphasised that trust required knowledge of the other party. Consequently, trust was something that was built over time as you came to know someone, or some organisation, through some sort of relationship. However, trust was commonly seen as a by-product of the relationship and not something that could be singled out and influenced on its own.

5.2. *Trust definitions – specific view*

Approximately 55% of participants expressed a more specific view of trust. These participants described trust as a particular aspect of the relationship itself, rather than as ‘having a good relationship’. Trust was frequently described in terms of ‘being able to rely’ on another person or agency. Both agency staff and community member participants defined trust in this way. Here are some examples of participant definitions of trust from a specific view.

The feeling that you can rely on someone else, or rely on something to happen to feel secure. (CM7)

Knowing that the agencies will be there, and knowing what they will do. (CM21)

The ability to believe in what another person is telling you without questioning it. And being sure that the outcome will be a positive one because of what you are being told. (CM4)

Some ‘specific view’ participants described trust as a one-way relationship of relying on agencies, or agency staff, because of the agencies’ expertise

I think that trusting is just having the confidence that they know what they are doing and just to believe that that’s the case. They know more than me, how to deal with these things. They have the experience and training, so to trust their expertise. (CM34)

Some participants described this type of one-way relationship during the 2006/07 fires. A couple described their willingness to rely on agency staff when they stated that they “suddenly felt safe and secure” when fire trucks arrived at their property. The couple were unsure whether they could successfully defend the property, but felt that they could rely on the fire-fighters to do so. Participants also described how they relied on information provided by the agencies during the fire to decide on what management actions to take at their properties.

Many agency staff also described trust as a one-way relationship where agencies provided services to the community, as evidenced in the quotes below. While these participants often described an interactive relationship with community members in which agencies “get to know the community so you are a known face” or “listen to what communities have to say”, their discussion of ‘what trust is’ involved descriptions of one-way, reliable service provision.

Trust is based on credibility, dependability, reliability. So, trust is when you say something, the local community will have faith that it will happen. (A4)

To build trust you've got to say g'day to everybody and just make that effort so they know that when something does happen that you're there to assist them and not blow your own trumpet. And then you've gotta produce the goods. I call it S-T-D, show, tell, demonstrate. When you work for government, you've really gotta be sure that what you say is backed up. (A7)

Official Victorian government policy now emphasises shared responsibility and greater community self-reliance in wildfire preparation and response. However, the findings suggest that some agency staff 'on-the-ground' continue to describe their role as fire service providers instead of joint partners with the community.

5.3. *Trust definitions – a combined view*

Approximately 25% of participants described trust in a way that combined both specific and broad views of trust. Trust was described as a positive relationship in which parties could rely on one another for certain actions or things. In contrast to some participants' specific view of trust, which often described a one-way reliance on agencies, those participants expressing a combined view of trust often identified reciprocity as an important part of trusting relationships. This view of trust most closely matches the shift in agency policy to collaborative relationships and shared responsibility. In the quotes below, trust is described as a two-way relationship in which both parties respect each other's knowledge, ability and opinions.

Trust in my eyes would be that I've gotta trust their decision, they've also gotta trust your decision so that both parties are happy... But both parties have gotta be prepared to talk it over. You're not always right. (CM25)

[Trust is] having faith or appreciation in an individual's or organisation's ability or knowledge, so that when they are interacting with you, you can value their involvement. (CM19)

Many of these same participants also noted how reciprocal relationships were necessary between fire agencies and local residents. Interestingly, these participants were most often community members who were volunteers in the CFA at a local level.

So trust from a CFA perspective, you trust that landowners will look after their own background. As a landowner you trust... if there's a fire in your area that you'll be notified or that you'll know that you'll get some sort of protection. (CM9)

While a few agency staff at regional and state-level described trust in this way, these participants were careful to emphasise the necessity of reciprocal relationships and explain that such relationships were not an abrogation of agency responsibilities.

... we just don't have the trucks to be at every house, so we do our best to give communities the information they need and give our all at a fire, but they've just gotta work at it, too, and prepare their house since we can't guarantee to be there. (A1)

5.4. *Trustworthiness*

We asked participants about how their trust in another person, agency or organisation increased or decreased in each management stage of a fire: before,

during and after a fire. When describing trust-increasing situations or incidents, participants often described actions by individuals and agencies that made the participant feel like they could trust that agency or person. Characteristics that made an individual or agency worthy of a participant's trust were common across agencies. Characteristics were also similar whether participants were describing individual neighbours or agency staff, or agencies and organisations as a whole. The most commonly described trustworthy characteristics are shown in Table 4.

Before the fire, the most commonly described characteristics of trustworthiness related to the integrity of the agencies and how they responded to, and included, local residents' needs and concerns in fire planning and preparation. The characteristics most commonly described included: responsive to needs; credible; transparent; open-minded; and, inclusive. Some participants who felt that the DSE, as an organisation, was not trustworthy questioned the agency's integrity. For example, the participant in the quote below did not think that the DSE shared her values for land or fire management and did not weigh her concerns for personal safety equally with agency conservation goals and objectives.

We've always been sort of fighting for retaining the natural environment, and here's the one instance where it almost feels like we're competing with the wildlife to have sanctuary... That's the thing I don't trust about them. I don't trust them to see us as equally important to the bush that's at the back of the land. (CM16)

In contrast to the before stage, the most commonly described trustworthiness characteristics in the during stage related to actions that demonstrated agency, or an agency member's, abilities and competence in fire-fighting. For example, one CFA participant noted that community-agency trust resulted from "[having] the right people to make the right decision, that have the skills and personality to do it". However, trustworthiness was not entirely based on ability. Some participants gave examples of individual CFA volunteers and DSE staff members who demonstrated benevolence when they took actions that were 'reassuring' during the emergency and "made decisions that had the residents' best interests at heart".

In contrast to the during stage, when competent actions and demonstration of ability were most frequently identified, the most frequently described characteristics of trustworthiness in the after stage related to benevolence (i.e. keeping residents' best interests at heart). Several participants explained that agency staff needed to understand the overwhelming mental, emotional and physical stress residents had undergone. Consequently, these participants frequently described trustworthy personnel as individuals who responded to residents' needs and concerns in a sensitive, compassionate and empathetic manner. However, the trustworthiness dimension of integrity (i.e. following shared norms of behaviour) was also described. Both agency and agency staff were described as trustworthy when they 'followed things through'. For example, the participant quoted below said that the most critical aspect to community-agency trust after a fire related to agencies 'keeping their word'.

Following-up on what they say they're going to do. And that's particularly with an organisation. Like one arm of the organisation says, "yes, we'll reimburse you" and the other arm says, "no, we won't". For us, we're dealing with an organisation. And to me, that's important. (CM17)

The trustworthiness dimension of ability also played a role in the after stage. Trust was increased when agency personnel were 'knowledgeable about all of the various services available'. Trust also increased when personnel could anticipate community members' needs and recommend particular services and grants on a one-on-one basis.

6. Discussion

6.1. Research literature compared to participant definitions of trust

Our research suggests that participant definitions of trust broadly mirror the definitions of trust found in the socio-psychological literature. During their interviews, participants explicitly or implicitly discussed elements of trust defined in the literature. In addition, participants' definitions of the trust concept did reflect their use of the term when discussing trusting relationships during the interviews. For example, the literature related to trust considers risk, vulnerability, uncertainty, expectation and interdependence as essential dimensions of the trust construct. In this research, participants' 'broad view' definitions generally did not describe risk, vulnerability, uncertainty and expectation, but did describe interdependence in their description of trust as a relationship. However, this view of trust did not differentiate trusting relationships from other types of relationships. In contrast, many participants expressing 'specific' views of trust directly described expectations of others, and to a lesser degree, the vulnerability related to relying on others. Most 'combined view' participant definitions directly addressed not only expectations and vulnerability, but also the interdependence of a relationship. A few 'specific' and 'combined' view participant definitions also described the risk, or 'leap of faith' involved in relying on others, but did not mention the underlying uncertainty of others' actions underlying that risk. However, the very nature of wildfire management implies risk and uncertainty, and many community members and agency staff described both the risk of losing life and property and the uncertainty related to both agency actions and fire behaviour when talking about their experiences in the wildfires.

6.2. Differentiating trust and trustworthiness

Much of the previous trust research in wildfire and other environmental management contexts has failed to differentiate between the constructs of trust and trustworthiness. Authors from other disciplines have also noted this problem in the broader trust literature (Hardin 2002, Dietz and den Hartog 2006, Mollering 2006). The findings from this research support socio-psychological conceptualisations of trust which differentiate trust and trustworthiness. Community member participants in the semi-structured interviews described both their willingness to rely on agencies (i.e. intention to trust) and the agency characteristics (i.e. trustworthiness) that made community members believe they could rely on the agencies. As explained below, our findings suggest that differentiating trust and trustworthiness provides an understanding not only about public perceptions of the agency (i.e. trustworthiness), but also about when individuals will act upon those perceptions (i.e. intention to trust). The distinction provides researchers and NRM agencies with new insights that can help them identify barriers to developing trusting relationships between communities and agencies.

6.3. Implications for resource managers

An intention to trust, or 'willingness to rely', refers to the trustor taking some sort of action (Kee and Knox 1970, Das and Teng 2004). If a trustor is willing to rely on the trustee, he or she must assume vulnerability (i.e. take on risk) to the trustee in some way under conditions of uncertainty and interdependence (McEvily *et al.* 2003, Dietz and den Hartog 2006). By focusing on the trusting intentions of community members, agencies can assess levels of uncertainty, vulnerability or interdependence across contexts or relationships, to determine how, or if, they can alter these conditions to build trust.

For example, our findings suggest that trust increases when agencies reduce residents' uncertainty during a fire. While it is usually not possible to provide property protection for every home, uncertainty may be reduced through accurate, reliable and timely information that is consistent across agencies (McCool *et al.* 2006, Paton 2007). Therefore, focusing on information provision may be one way to reduce levels of uncertainty across contexts and relationships. Further, our findings show that community members are 'willing to rely' when they feel that they are part of a relationship. Reducing vulnerability through relationship-building supports considerable research that suggests interpersonal relationships developed at the local level are critical to trust-building (Olsen and Shindler 2010, Toman *et al.* 2011, LaChapelle and McCool 2012). Finally, levels of interdependence between community members and agencies may differ. Residents living at the public-private land interface are more likely to be impacted by agency management actions than residents living several kilometres away from public land. Therefore, agencies may need to place greater focus on community engagement efforts (Cooke *et al.* 2012) and collaborative, cross-boundary management programmes (Fischer and Charnley 2012) with those landholders most likely to be impacted by agency actions.

Second, in contrast to trust components which may influence when a community member is willing to rely on an agency, consideration of trustworthiness provides information about agency characteristics and actions which influence community members' intentions to trust. Consistent with previous research (Winter *et al.* 2004, Davenport *et al.* 2007, Paton 2007), our findings suggest that demonstrating strong leadership and consistent, competent actions (i.e. demonstrating ability) are important indicators of trustworthiness. The findings also suggest that agencies and their staff may build trust by demonstrating that they have the communities' best interests at heart (e.g. demonstrating compassion, respect and reassurance) and share community values and norms (e.g. demonstrating transparency, credibility and honesty in actions). The importance of shared values and benevolence in positive perceptions of agency trustworthiness has also been shown in other environmental contexts, such as water resource management (Leahy and Anderson 2008) and public grassland management (Davenport *et al.* 2007). Therefore, focusing on ways to demonstrate the actions and characteristics identified in this study, associated with the three component of trustworthiness, will help agencies build trusting relationships with community members.

6.4. Theoretical implications

From a theoretical perspective, recent conceptualisations of trust in the risk management literature suggest that trust may be considered calculative (i.e. based on confidence) or relational (i.e. based in personal relationships) (Earle 2010). In this view, positive perceptions of competence lead to calculative trust, or confidence, and

positive perceptions of benevolence and integrity lead to relational trust. However, our findings suggest that community members and agency staff describe all three components of trustworthiness (i.e. ability, benevolence and integrity) when describing the base for their trusting intentions. This supports the conceptualisations by Mayer *et al.* (1995), McKnight *et al.* (1998) and Mollering (2006) which suggest that confidence should not be equated with trust, and trusting intentions are based in both care (i.e. benevolence and integrity) and competence (i.e. ability) components of trustworthiness. Therefore, building public confidence may be a sufficient relationship base if agencies' goals are simply building passive public acceptance for agency actions and one-way community-agency relationships involving reliance on agencies for service provision. However, recent shifts in policy emphasise collaborative community-agency relationships in NRM contexts (Marshall and Jones 2005) with a particular emphasis on shared responsibility in wildfire management (DSE 2005, CFA 2008). Therefore, two-way relationships between community members and agencies may best be based in trusting relationships which involve both trusting intentions and active considerations of the other's trustworthiness.

7. Conclusion

Our research explored community member and agency staff definitions of trust and descriptions of trustworthiness in a wildfire management context. We found that most participants could provide a definition of trust, and this definition generally reflected how they had used the term throughout the interview. Further, the research suggests that stakeholders in this specific context do differentiate between trust and trustworthiness, providing support for socio-psychological conceptualisations of trust which differentiate these constructs. However, this qualitative research cannot be generalised to other contexts and the clear difference between trust and trustworthiness found in this study may be due to the wildfire context in Australia. In this context, the risk and uncertainty posed by fire are very clear and this may pose a heightened sense of vulnerability and a need to trust agency actions and communication (i.e. trusting intentions), as well as a higher level of awareness of agency performance and care (i.e. trustworthiness). Qualitative research exploring research participant understandings of trust and trustworthiness in other environmental management contexts would be valuable, as would quantitative studies showing discriminant validity between measures of trust and trustworthiness.

Our research suggests that differentiating trust and trustworthiness has important management implications. The research shows that it is not only what agencies do but how they do it that influences community member perceptions of agencies' trustworthiness, which in turn influences community members' willingness to rely on managing agencies. Socio-psychological conceptualisations of trust which differentiate between trust and trustworthiness give agencies greater insight into how the community understands trusting relationships, when community members are 'willing to rely' and the considerations used by community members in evaluating agency trustworthiness. Further, given the common acceptance of the need for community-agency collaboration in NRM contexts, our findings highlight how some agency staff members continue to describe their roles as service providers instead of as collaborative partners. However, effective collaboration and community-agency partnerships will require a move beyond mere confidence in management agencies to reciprocal trusting relationships.

Acknowledgements

This research was funded by Charles Sturt University. The paper was written by the lead author while undertaking a post-doctoral fellowship with the National Centre for Groundwater Research and Training, Australia. The authors wish to thank Simon McDonald from CSU SPAN for creating the study area map.

References

- Absher, J.D. and Vaske, J.J., 2011. The role of trust in residents' fire wise actions. *International journal of wildland fire*, 20, 318–325.
- Australian Bureau of Statistics., 2006. *2006 Census Quick Stats (Postal Area)* [online]. Available from: <http://www.censusdata.abs.gov.au> [Accessed 17 July 2008].
- Barber, B., 1983. *The logic and limits of trust*. New Brunswick, NJ: Rutgers University Press.
- Beunen, R. and de Vries, J.R., 2011. The governance of Natura 2000 sites: the importance of initial choices in the organisation of planning processes. *Journal of environmental planning and management*, 54 (8), 1041–1059.
- Bigley, G. and Pearce, J., 1998. Straining for shared meaning in organisation science: problems of trust and distrust. *Academy of management review*, 23 (3), 405–421.
- Blomqvist, K., 1997. The many faces of trust. *Scandinavian journal of management*, 13 (3), 271–286.
- Bradshaw, M. and Stratford, E., 2005. Qualitative research design and rigor. In: I. Hay, ed. *Qualitative research methods in human geography*. 2nd ed. South Melbourne: Oxford University Press, 67–76.
- Butler, J.K., 1991. Toward understanding and measuring conditions of trust: evolution of a conditions trust inventory. *Journal of management*, 17 (2), 643–663.
- Cooke, B., et al., 2012. Social context and the role of collaborative policy making for private land conservation. *Journal of environmental planning and management*, 55 (4), 469–485.
- Country Fire Authority, Department of Sustainability and Environment, Department of Human Services, Metropolitan Fire Brigade, 2008. *Living with fire: a community engagement framework 2008–2012*. Melbourne: State of Victoria.
- Das, T.K. and Teng, B.S., 2004. The risk-based view of trust: a conceptual framework. *Journal of business and psychology*, 19 (1), 85–116.
- Davenport, M.A., et al., 2007. Building trust in natural resource management within local communities: a case study of the Midewin National Tallgrass Prairie. *Environmental management*, 39, 353–368.
- Department of Sustainability and Environment, 2005. *Community engagement about fire on public land – plan to improve*. Melbourne: State of Victoria.
- Dietz, G. and den Hartog, D.N., 2006. Measuring trust inside organisations. *Personnel review*, 35 (5), 557–588.
- Dirks, K.T. and Ferrin, D.L., 2001. The role of trust in organizational settings. *Organization science*, 12 (4), 450–467.
- Earle, T.C., 2010. Trust in risk management: a model-based review of empirical research. *Risk analysis*, 30 (4), 541–574.
- Earle, T.C., Siegrist, M., and Gutscher, H., 2007. Trust, risk perception and the TCC model of cooperation. In: M. Siegrist, T.C. Earle and H. Gutscher, eds. *Trust in cooperative risk management: uncertainty and scepticism in the public mind*. London: Earthscan, 1–50.
- Fischer, A.P. and Charnley, S., 2012. Risk and cooperation: managing hazardous fuel in mixed ownership landscapes. *Environmental management*, 49, 1192–1207.
- Gambetta, D., 1988. Can we trust trust? In: D. Gambetta, ed. *Trust: making and breaking cooperative relations*. New York: Basil Blackwell, 213–237.
- Hardin, R., 2002. *Trust and trustworthiness*. New York: Russell Sage Foundation.
- Hudson, B., 2004. Trust: towards conceptual clarification. *Australian journal of political science*, 39 (1), 75–87.
- Johnson, B.B., 1999. Exploring dimensionality in the origins of hazard-related trust. *Journal of risk research*, 2 (4), 325–354.

- Johnson, R.J. and Scicchitano, M.J., 2009. Willing and able: explaining individuals' engagement in environmental policy making. *Journal of environmental planning and management*, 52 (6), 833–846.
- Kee, H.W. and Knox, R.E., 1970. Conceptual and methodological considerations in the study of trust and suspicion. *Journal of conflict resolution*, 14, 357–366.
- LaChapelle, P.R. and McCool, S.F., 2012. The role of trust in community wildland fire protection planning. *Society and natural resources*, 25 (4), 321–335.
- Leahy, J.E. and Anderson, D.H., 2008. Trust factors in community-water resource management agency relationships. *Landscape and urban planning*, 87, 100–107.
- Lewis, D.J. and Weigert, A., 1985. Trust as a social reality. *Social forces*, 63 (4), 967–984.
- Liljeblad, A., Borrie, W.T., and Watson, A.E., 2009. Determinants of trust for public lands: fire and fuels management on the Bitterroot National Forest. *Environmental management*, 43, 571–584.
- Lokhorst, A.M., van Dijk, E., and Staats, H., 2009. Public commitment making as a structural solution in social dilemmas. *Journal of environmental psychology*, 29, 400–406.
- Luhmann, N., 1979. *Trust and power*. Chichester: John Wiley and Sons.
- Luhmann, N., 1988. Familiarity, confidence, trust: problems and alternatives. In: D. Gambetta, ed. *Trust: making and breaking cooperative relations*. New York: Basil Blackwell, 94–107.
- Mandarano, L. and Paulsen, K., 2011. Governance capacity in collaborative watershed partnerships: evidence from the Philadelphia region. *Journal of environmental planning and management*, 54 (10), 1293–1313.
- Marshall, B.K. and Jones, R.E., 2005. Citizen participation in natural resources management: does representativeness matter? *Sociological spectrum*, 25, 715–737.
- Mayer, R.C., Davis, J.H., and Schoorman, F.D., 1995. An integrative model of organizational trust. *Academy of management review*, 20 (3), 709–734.
- McAllister, D.J., 1995. Affect- and cognition-based trust as foundations for interpersonal cooperation in organisations. *Academy of management journal*, 38 (1), 24–59.
- McCool, S.F., Burchfield, J.A., Williams, D.R., and Carroll, M.S., 2006. An event-based approach for examining the effects of wildland fire decisions on communities. *Environmental management*, 37 (4), 437–450.
- McEvily, B., Vincenzo, P., and Zaheer, A., 2003. Trust as an organizing principle. *Organization science*, 14 (1), 91–103.
- McKnight, D.H. and Chervany, N.L., 2001. What trust means in e-commerce customer relationships: an interdisciplinary conceptual typology. *International journal of electronic commerce*, 6 (2), 35–59.
- McKnight, D.H., Cummings, L.L., and Chervany, N.L., 1998. Initial trust formation in new organizational relationships. *Academy of management review*, 23 (3), 473–490.
- Mishra, A.K., 1996. Organizational response to crisis: the centrality of trust. In: R.M. Kramer and T.R. Tyler, eds. *Trust in organizations: frontiers of theory and research*. Thousand Oaks, CA: Sage, 261–287.
- Mollering, G., 2006. *Trust: reason, routine, reflexivity*. London: Elsevier.
- ter Mors, E., et al., 2010. Effective communication about complex environmental issues: perceived quality of information about carbon dioxide capture and storage (CCS) depends on stakeholder collaboration. *Journal of environmental psychology*, 30, 347–357.
- Olsen, C.S. and Shindler, B.A., 2010. Trust, acceptance and citizen-agency interactions after large fires: influences on planning processes. *International journal of wildland fire*, 19 (1), 137–147.
- Paton, D. 2007. Preparing for natural hazards: the role of community trust. *Disaster prevention and management*, 16 (3), 370–379.
- Patton, M.Q., 1990. *Qualitative evaluation and research methods*. 2nd ed. Newbury Park, CA: Sage.
- Poortinga, W. and Pidgeon, N.F., 2003. Exploring the dimensionality of trust in risk regulation. *Risk analysis*, 23 (5), 961–972.
- Prosser, B. and Peters, C., 2010. Directions in disaster resilience policy. *The Australian journal of emergency management*, 25 (3), 8–11.
- Richards, L., 2005. *Handling qualitative data: a practical guide*. London: Sage.
- Rousseau, D. M., et al., 1998. Not so different after all: a cross-discipline view of trust. *Academy of Management review*, 23 (3), 393–404.

- Rubin, H.J. and Rubin, I.S., 2005. *Qualitative interviewing: the art of hearing data*. 2nd ed. Thousand Oaks, CA: Sage.
- Ryan, C.M. and Klug, J.S., 2005. Collaborative watershed planning in Washington State: implementing the Watershed Planning Act. *Journal of environmental planning and management*, 48 (4), 491–506.
- Seppanen, R., Blomqvist, K., and Sundqvist, S., 2007. Measuring inter-organizational trust – a critical review of the empirical research 1990–2003. *Industrial marketing management*, 36, 248–265.
- Shindler, B.A., Brunson, M., and Stankey, G.H., 2002. *Social acceptability of forest conditions and management practices: a problem analysis*. Gen. Tech. Report PNW-GTR-537. Portland, OR: USDA, Forest Service, Pacific Northwest Research Station.
- Siegrist, M. and Cvetkovich, G., 2000. Perception of hazards: the role of social trust and knowledge. *Risk analysis*, 20 (5), 713–719.
- Sitkin, S.B. and Pablo, A.L. 1992. Reconceptualizing the determinants of risk behaviour. *Academy of management review*, 17 (1), 9–38.
- Stankey, G.H. and Shindler, B., 2006. Formation of social acceptability judgments and their implications for management of rare and little-known species. *Conservation biology*, 20 (1), 28–37.
- Toman, E., *et al.*, 2011. Reducing fuels in the wildland-urban interface: community perceptions of agency fuels treatments. *International journal of wildland fire*, 20, 340–349.
- Treffny, R. and Beilin, R., 2011. Gaining legitimacy and losing trust: stakeholder participation in ecological risk assessment for marine protected area management. *Environmental values*, 20, 417–438.
- Vogt, C.A., Winter, G., and Fried, J., 2005. Predicting homeowners' approval of fuel management at the wildland-urban interface using the theory of reasoned action. *Society and natural resources*, 18, 1–18.
- Winter, G.J., Vogt, C., and McCaffrey, S., 2004. Examining social trust in fuels management. *Journal of forestry*, 102 (6), 8–15.
- Wondelleck, J. and Yaffee, S., 2000. *Making collaboration work: lessons from innovation in natural resource management*. Washington, DC: Island Press.