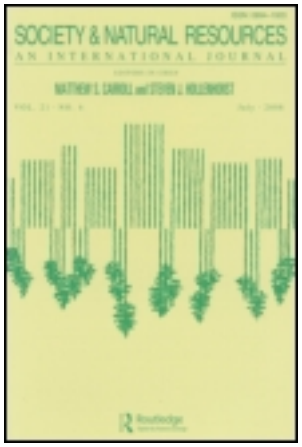

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Nontribal Community Recovery from Wildfire Five Years Later: The Case of the Rodeo-Chediski Fire

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Nontribal Community Recovery from Wildfire Five Years Later: The Case of the Rodeo–Chediski Fire

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Recent literature suggests that natural disasters such as wildfires often have the short-term effect of "bringing people together" while also under some circumstances generating social conflict at the local level. Conflict has been documented particularly when social relations are disembedded by nonlocal entities and there is a perceived loss of local agency. There is less agreement about longer term impacts. We present results of a re-study of a set of communities affected by the largest wildfire in Arizona history. The re-study uses structuration theory to suggest that while local recovery has been generally very successful, vestiges of both fire-related social cohesion and conflict have survived. While some sources of post-fire conflict and cohesion have remained relatively unchanged, others have evolved. We suggest that more needs to be known about the longer term effects of large wildfire events and the role that advanced preparation for such events plays in local recovery.

Keywords conflict, hazard recovery, longitudinal research, structuration, wildfire

There is growing attention to the intrusion of wildland fires into residential areas as a human and biophysical event (Jakes et al. 2007; McCaffrey 2004). Depending on the magnitude of the fire, the fuel conditions, and social preparedness of those living in local areas affected, fires can be traumatic events in the lives of local community residents (Carroll et al. 2006). Various conceptual frameworks have been employed to understand social responses to such fire events. One such framework

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(referred to as an event-driven model) (McCool et al. 2006; Daniel et al. 2007) suggests that the temporal dimension is important to understanding human/wildland fire dynamics.

The current study attempts to take the temporal question of local social dynamics following wildfires a step further by revisiting a community 5 years after a particularly destructive wildfire to document continuing social impacts. The senior author and colleagues first studied the impacts of the Rodeo–Chediski fire on local communities in 2002 (Carroll et al. 2005). The fire resulted from two human-ignited starts that subsequently merged and became the largest forest fire in recorded Arizona history. The study used Giddens's (1984) structuration theory to explain how the fire triggered both social cohesion and conflict among actors in the local areas studied during and immediately following the event. We argued that future research should look at how local and nonlocal institutions are "remodeled" in the years following catastrophic wildfire.

Accordingly, this article uses structuration theory to document the longer term social impacts of the fire on local nontribal communities that were directly affected by the fire. We pay particular attention to the details of both the fire-related conflict and cohesion observed in the first study as well as the local and outside actors and institutions engaged in fire-related activities before, during and after a wildfire event. We suggest this approach is helpful because there is little research documenting the longer term impacts on communities disrupted by such disasters and especially the impact on preparation for future fire events (Carroll et al. 2005). It provides a lens through which to understand how disasters such as wildland fires affect residents' views on future management by local and federal agencies and preparedness for future events. Theoretically speaking, such events and the resulting social interactions are enabling and constraining to local actors in the long term (Giddens 1984; Flint and Luloff 2005). Such an understanding is of importance to wildfire management, given the growing number of communities that have felt the impact of large fire events.

Literature Review

Disaster researchers have often disagreed over whether and how conflict and/or cohesion results from disaster events. Many early sociological studies of disasters argued that extreme events initially trigger the emergence of social cohesion and altruistic norms in the communities affected (Dynes 1970; Drabeck 1986). Since then, various disaster scholars (Quarantelli and Dynes 1976; Erikson 1976; Freudenburg 1997) have often claimed that human-caused "technological disasters" usually lead to more community conflict ("corrosive community"), while natural disasters more commonly bring community members together in mutual support ("therapeutic community") (Cuthbertson and Nigg 1987; Dynes and Quarantelli 1971).

Although there is a large literature on the link between community conflict/cohesion following natural disasters, there has been much less longitudinal research on these dynamics. Among the work that has been conducted in this vein is Sweet (1998), who documented short-lived social cohesion following an ice storm and concluded that there are few lasting effects from such events. Other such as Tapsell and Tunstall (2008) and Yoon (2009) conducted longitudinal studies of community response to floods and the longer term impacts, with varying results in terms of conflict and cohesion. Longitudinal research on the social impacts of hurricanes suggests

that, in the longer term, such events may amplify tensions related to social and economic stratification (Pais and Elliot 2008; Cutter 2005).

In contrast, technological disasters have been argued to foster longer lasting negative effects on the community than natural disasters (Picou and Gill 2000; Kroll-Smith and Couch 1990; Erikson 1994), in part because of persistent fear and/or health effects. Those in this camp also suggest the oft-held perception among technological disaster victims that their misery results from human action leading to the event or inaction in failing to prevent/mitigate it adds to the psychological impact (Cutter 2005; Erikson 1994).

A growing body of research now questions the distinction between technological and natural disasters, particularly in terms of their impacts. In many cases the processes driving a natural disaster event may be influenced by human action and technological disasters often have some natural elements (Flint and Luloff 2005; Brancati 2007). Research following hurricane Katrina has further demonstrated that both conflict and cohesion can occur simultaneously and persist following disasters. This is in part because such events tend to amplify preexisting social relationships (Tierney 2007; Brunsma and Picou 2008).

Wildland Fire

Wildland fire clearly encompasses aspects of both natural and technological disasters (Kumagai et al. 2006; Carroll et al. 2007). The natural causal elements of wildland fire, such as drought and lightning, are perhaps more obvious than the technological factors such as previous fire suppression and other land management actions preceding such events. Other factors contributing to fires and the damage they cause include direct human ignition and what are sometimes seen locally as the ''inadequate'' efforts of firefighting teams from outside the community (Kumagai et al. 2006; Carroll et al. 2005). In an era of widespread conflict over management of federal forests, different sides tend to blame the other for fire severity. Those on the side of environmental protection blame past forest management decisions, while those on the more utilitarian side of the argument tend to blame environmental gridlock for a lack of fuels management in the forest (Daniel et al. 2007).

Carroll et al. (2006) were among the most recent to point out that strategies for preventing or minimizing fire damage in areas near human settlements are the result of rationalization, the human attempt to master the natural world with scientific and technological systems of control. One clear example of this is the federal Incident Command System (ICS), a highly structured, standardized, and hierarchical approach to managing wildfires and other disaster situations (e.g., the *Challenger* disaster) that, although regarded by many as the best in the world, has been found at times to conflict with local expectations, culture, and norms of interaction (Schneider 1992; Kumagai et al. 2006).

The question of local conflict and cohesion in the wake of significant fire events is important for practical management and for understanding subsequent community dynamics (Burchfield 2007). Prevailing wisdom suggests that local communities need to play an important role in protecting themselves from potential wildfire damage, meaning that the ability of a community to have its citizens and local groups work well together internally and with outside institutions in taking the steps necessary to prepare for and mitigate the impact of high-intensity fires is critical (Jakes et al. 2007; Fleeger 2008). The adaptations needed are both short

and longer term, including how residents perceive of fire hazard and their willingness/ability to prepare or recover from damaging wildfire events. We turn to the latter topic now.

There is a significant literature on residents' willingness or ability to prepare for fire events or recover afterward (Vogt et al. 2005; Walker et al. 2006; Shindler and Toman 2003). Researchers as early as Stankey (1972) and Mutch (1976) made the case that personal responsibility was essential to the "era of fire inclusion," in which residents would be active stakeholders in community efforts to "live with fire." Subsequent researchers have indicated that a myriad of issues contribute to attitudes toward fire and implementation of defenses, including trust in or understanding of the agencies collaborating on fire protection (Vogt et al. 2005; Winter and Fried 2000); geographic location within the United States (Brunson and Shindler 2004; Kneeshaw et al. 2004); and education or awareness of fire processes (Parkinson et al. 2003; McCaffrey 2004).

Structuration Theory and Disaster Events

This study continues to build the growing body of research, including the original study, that examines community conflict and cohesion in the wake of a community disaster event (Brancati 2007; Flint and Luloff 2005; Tierney 2007). From an analytical perspective we concur with Aronoff and Gunter (1992, 346) that "theoretical models that fail to consider both constructivist and structural dimensions of these crises ignore the integral relationship between structure and agency reflected in local experience." Disasters, the circumstances that lead up to them, and the communities in which they occur have material (i.e., economic, physical infrastructure, biophysical) or structural (i.e., organizations, local political structures, demographics) elements that enable or constrain action.

Elements of Giddens's (1984) structuration theory were adopted in the first study and here to allow for the consideration of both social interaction or agency (as it applies to local resident understanding and response to the event) and social structure (as it triggers, shapes, and constrains such understanding and response). His theory posits that the structure of society, defined as the "rules and resources recursively implicated in the reproduction of social systems" (p. 19), both enable and constrain social actors from enacting change through action (agency). In this "duality of structure," social constraint and social action cannot be separated from one another (25). Structures are embedded in social systems, the reproduced relations between actors or collectivities that are organized in the routine of everyday practices. Thus, it becomes clear that social systems and organizations are not structure themselves, but have structural properties that actors can observe and modify. Such a perspective allows us to explore structural factors behind human responses to disaster (e.g., conflict, cohesion, or both) and provides a mechanism to document their evolution, that is, how resident perceptions and experience of the Rodeo–Chediski fire transitioned over time and some morphed into structure. The resulting structure created during this process is the underpinnings for further interactions among local residents.

Study Area

The area is rural (no one community exceeds 20,000 in population); most of the non-Indian communities in the region date back to the late 1800s and their early

histories were tied to logging and grazing. The fire covered parts of four counties, but the communities studied are all in one county with an overall population of 97,470 (U.S. Census 2003). The two predominant landholders in the study area are the Apache–Sitgreaves National Forest and the Fort Apache Indian reservation. With the exception of timber extraction on the reservation lands, the timber industry had collapsed in the area over the two decades prior to the fire, due in large part to harvest reductions on the national forest. The local economy is now fueled by part-time summer residents (more than 27% of the local population) who use the mountainous region as an escape from the high summer temperatures in the Phoenix metropolitan area (U.S. Census 2003). The three nontribal community clusters that were the focus of both studies were given the pseudonyms Centerville, Forestville, and Pioneertown in the initial study, and those pseudonyms are maintained here.

The current study was designed to revisit the same communities and at least some of the same issues uncovered in the first study. We wished to see how local actors adapted after the fire and how the issues that figured prominently in 2002 had played out over the ensuing 5 years. In short, what are the lessons that we can begin to draw about the longer term impacts of large wildfire events?

Methods

The interview data for both studies were gathered and analyzed using a qualitative, inductive approach to understanding social phenomena. Data are collected to identify relevant categories representative of the structure and agency operating in local contexts, and collection is suspended only when observed patterns stabilize and no novel information is forthcoming from later observations (Glaser and Strauss, 1999). In the second study, we focused on key informants, i.e., people identified as possessing particular local knowledge and who could talk about the changes that had occurred since the first study. Roughly two-thirds were re-interviews of informants from the first study, while the remainder consisted of individuals knowledgeable about or representative of categories sampled in the first study (i.e., current mayors, business owners, etc.). The large number of re-interviews in this study was obtained specifically to gauge how existing community sentiment had or had not changed in the 5 years since the fire, and an effort was made to interview new residents or those familiar with new residents and the current incumbents of key positions in local organizations and government.

The result is a sample of key informants who were familiar with the residents of each of the three community clusters (including specific subdivisions within them), how they were affected by the fire, and how things have changed in these places. These included current and former local government and federal land management agency officials, clergy, social workers, health professionals, public safety workers, and those familiar with the local business community. Also interviewed were local environmental and community activists, forestry contractors, and local media professionals. The senior author conducted a total of 46 semistructured, face-to-face key-informant interviews in the study area during October 2007. Interviews generally ranged from 60 to 90 minutes and were conducted in the informants' homes or places of business. All interviews were tape-recorded and later transcribed word-for-word. This resulted in a fairly manageable data set, and in keeping with an inductive approach, the senior author conducted a thematic analysis of the data by hand in order to identify relevant themes that emerged from the interview data (Silverman

2001). Thematic analysis is an inductive method for identifying and expressing patterns in qualitative data; statements are coded into categories reflective of observed patterns in the data, which are then situated into larger themes and illustrated by representative quotations (Boyatzis 1998; Aronson 1994).

To code the interview statements, the first and second authors (1) used observational and interview notes to identify emergent patterns and initial themes of importance; (2) compiled related quotations and observations after in-depth review of the transcribed interviews, a process dubbed the ''discovery'' stage by Maykut and Morehouse (1994); (3) identified and took into account any observed anomalies or apparent contradictions in the data, a process referred to in the literature as progressive falsification (Glaser and Strauss 1999); (4) shared themes with the other author analyzing data in order to refine themes and provide intercoder reliability; and (5) selected quotations most representative of the relevant patterns. The final two stages required the coders to agree upon themes and their expression.

Results

We began by exploring whether and how the two major dynamics (conflict and cohesion) that emerged in the first study had played out in the ensuing years. As noted earlier, we also retained structuration theory as a framework for exploring these dynamics to maintain a continuity of understanding between the two studies. The analysis suggested that elements of both fire-related conflict and cohesion were still evident in nontribal communities 5 years after the Rodeo–Chediski fire, though they have evolved during that time. Both of these dynamics appear to have implications for future local fire preparedness. Other details related to these dynamics were uncovered that also appear to have longer term consequences for such preparedness.

Fire as a Galvanizing Influence

This study found evidence that much of the ''coming together'' spirit following the fire had survived well after the initial study. The following is from a local Salvation Army official with years of professional disaster experience:

> [The fire] did . . . things that were good . . . [eventually] it drew the community together in a way that nothing else could have, you know, and really made it tight and it broke down a lot of barriers. It didn't seem that way at first because well you know after a disaster you, there's people that, they're just angry and everybody's angry and they don't know who to be angry at, so they're just angry all the time.

Five years later, evidence of local people and groups continuing to support each other and to solve many of the problems left behind was found in all three of the community clusters. Examples were evident in a variety of arenas including churches, fire departments, police departments, and newly formed groups dealing with debris removal, home building for those in need, or fire safing. Said one community organizer in Forestville:

> We went through some immense hurdles here and a lot of it was misunderstandings of how things were handled in, by the government,

> you know, and all this stuff, but again, I mean, I have to pat ourselves on the back. We formed groups, we came in, we did fundraisers, we never left our people hanging.

The galvanization also has been transformed into local community action. For example, a woman from the hardest hit subdivision in Forestville organized local volunteers to clean up burned material in residents' yards and led a successful grant-writing effort to obtain financial assistance. She said the following:

> The grant writing is because a lot of the money [that would have been available] has gone to [Centerville], so there really wasn't much money left into that fund. We worked probably pretty much all the property up here except for the ones that refused our help.

In Pioneertown a preexisting community volunteer organization evolved into a fire relief group that helped locals who might "have fallen through the cracks" of preexisting social service provision. The fire appears to have had both a galvanizing and local capacity-building influence. Once the community pulled together to help those in need, individual and organizational identities were more oriented toward helping activities.

Fire as a Fragmenting Influence

> [W]hen you create memories and you've done this and you've done that with your wife or your children . . . and something horrible as a monster comes and rips that away, you're still looking for it, you're still looking for those memories and they're gone.

Clearly a portion of the short-term social galvanization triggered by the fire has survived. But what of the fire-related conflicts documented in the first study? The initial study documented a number of specific sources and arenas of fire-related tension and conflict. The interview data in this study indicate that three of these have remained particularly salient to local actors: (1) federal versus local conflict over how the fire was fought; (2) environmental conflict concerning forest conditions and management and the relationship to past and future fire risk for the communities; and (3) cultural conflict between some local whites and the White Mountain Apache tribe on whose reservation lands both fire starts occurred.

Before going into detail about the specific points of these conflicts, it is fair to report that the interview evidence suggests that the *overt manifestations* of these conflicts (i.e., observable conflict between individuals, communities, or outside agents) have largely disappeared from the day-to-day public arena. Rather than showing on the surface, they have become one part of the taken-for-granted "givens" in interactions among individuals, communities, and outside agents:

> A lot of people that supported their community economically-wise or many [people] still [have] a lot of anger, it's sort of like the Kennedy shooting, you know, in everything there's not necessarily a conspiracy, but there's an underlying [feeling] and people lost a lot of faith in the

> federal government, they lost a lot of faith in their local government . . . A lot of it isn't founded, which is really the sad part about it . . . But there are, there are some things that could have been handled differently . . . [A [A number of local people] you know would volunteer have drawn back . . . It's because of the mistrust [of] authority.

Local Versus Federal Tension/Conflict

Perhaps the most passionate fire-related conflicts documented in the first study were those surrounding some of the decisions made by federal firefighters during the fire event. These initial conflicts seemed likely to spill over into long-term relationships between the local actors in Forestville and Pioneertown and the federal land management agencies in the area, particularly the Bureau of Indian Affairs (BIA) and the Forest Service. Interviews with many of the key informants for the present study indicated that few opinions concerning how the fire was fought had changed from those documented in the first study. One notable exception was a now former mayor who had initially defended the firefighting, but who reported now having additional information that led him to be far more critical of the actions of the federal agencies involved.

A widely held belief on the part of many residents documented in the first study—that the Rodeo fire was not dealt with quickly and forcefully enough by the BIA when it was still small—has now become a key element in local narratives about the fire. This is despite detailed refutation to these contentions by the now-retired BIA official initially in charge of the fire. He was asked directly about the allegation that he turned firefighting equipment back on the first day of the fire:

> Well it depends on your perspective . . . the first request we had was from structure engines up here on the mountain saying can we come on down. I said we can't even get a dozer onto this thing, just leave them there. I said it's gonna be better because we're gonna need them up there anyway tomorrow. I said we don't want to get them committed, so we turned them down because of that and where that fire was.

The retired BIA official agreed with local allegations that air tankers were slow to arrive early on, adding that given all the other fires burning at that time, the relatively slow response was not for lack of requests by federal fire officials, including him, but because of competing demands.

Many local firefighters in Pioneertown, and especially Forestville, had solidified their initially expressed resentment concerning the decisions made by the federal fire commanders. Local residents continued to believe that the firefighting strategies sacrificed (and could well have sacrificed more) houses in some of the smaller towns in the fire path. A widely held local view (which includes some local fire chiefs who were in charge at the time) remained: that independent actions by local fire companies in opposition to orders by the federal incident commander saved 500 houses in Forestville. There also remained a belief that if aggressive action had been taken earlier more homes could have been saved. Said one fire chief:

> Ok, if Type 1 [Federal Level Incident Command Team] came in here, if they'd followed our suggestions when we started, yeah we could have stopped that fire back up on the rim. But no, it was almost like they wanted

> to see some houses lost. They wouldn't do anything until they lost homes and then look at it, it all came together, so why did they wait three days?
>
> *Interviewer: And people haven't forgotten that?*
>
> No they never will forget that.

The chief of one of the local fire departments in Forestville told a story that had not been made public at the time of the first study—a visit to the local firehouse by the overall Type 1 commander shortly after the fire.

> He must have stayed a whole 8 minutes, maybe 10, but he didn't like some of the questions that were asked, so he turned to his second-in-command and he says: "I'm out of here" and he left, walked him out the door . . . That's exactly what he did . . .
>
> *Interviewer: Do you think that his leaving did additional damage?*
>
> Well they didn't like him in the first place, they thought he was something else, but then they knew, THEY KNEW [emphasis added] . . . I, we've never gotten over it.

Yet some of the younger, up-and-coming leaders in the local fire departments seemed to take a more conciliatory view regarding the federal decision making on the fire:

> I think that there were probably certain things that the feds could have done better, but in a situation like that, there wasn't a lot of time to take people in and instruct them on how this was done.

The following quotation from an emergency services person from Forestville perhaps best summarizes the sentiment 5 years afterward of Forestville and Pioneertown residents reflecting on the Type 1 team's interaction with them during the fire:

> They should have [come] in here and joined hands with all these small fire departments and said ok, where are the communities, you know, do we need to help here, you know, we know the community, we've had several smaller fires. We know the way fire moves in. Yes they're all gifted, intelligent and studied individuals that understand fire science, but we know our area.

This and similar quotes illustrate our contention from the first study that negative responses are most likely to occur when incongruent local and disembedded nonlocal systems are engaged in a local context. The fact that these sentiments were still so much in the minds of informants 5 years later suggests that the local responses to external actors play significant roles beyond the immediate aftermath of disaster events.

Environmental Conflict

The initial study demonstrated that environmental conflict over the management of the local national forest had strongly influenced local perceptions concerning the

root cause of the fire and how to mitigate future fire risk. According to recent interviewees on all sides of the issue, litigation over salvage logging has continued to affect wildfire management. According to Forest Service officials, this litigation significantly curtailed, but did not completely stop, salvage logging sales on national forest lands in the area. In contrast, BIA and tribal officials indicated that salvage logging on the reservation moved much more rapidly and resulted in the commercial recovery of a much larger proportion of burned material on reservation lands. A (now retired) Forest Service official stated:

> You know, Forest Guardians [a regional environmental group] sued the Forest over cutting dead trees; took the federal judge 18 months to render a decision. He was for the forest in I think 5 of 7 counts, but by then it was too late, the lumber had . . . blue stain and devalued and root rot, so they won.

Another development, however, appears to bode more positively for relationships among former local adversaries over environmental issues concerning fire and the local national forests. Under the authority of the federal Healthy Forest Restoration Act the Lakeside Ranger District of the Apache–Sitgreaves National Forests entered into what was, at the time of the second study, the largest forest stewardship contract in the country. The purpose of the contract is to thin overgrown forest stands in order to improve general forest health and reduce catastrophic fire risk. The main focus of these efforts is in the wildland–urban interface around Centerville and Forestville.

What is particularly significant for the present study is that this arrangement, unlike many others concerning forest management attempted in the past, has the support of local environmental groups, who by their own admission would have been highly suspicious of such arrangements prior to the fire. This reflects a substantial change in viewpoints on the part of these local environmentalists concerning forest management and was clearly linked to the fire experience and the perceived need to change forest conditions particularly near human settlements.

A local environmental leader said the following about the stewardship contract:

> I guess the change has been [that] everybody's just a little bit more aware, more tolerant of seeing the logging around them, they're more tolerant of putting up with the smoke from the prescribed burning that's going on in the spring and fall, I guess that's the biggest thing.

One locally based forester who has years of experience working on these issues said the following:

> I would say we've got a complete détente between the [local] environmental community, the Forest Service, the people who are extracting and processing materials through the forest.

Clearly, broad support for stewardship contracting represents a new congruence triggered by the magnitude and damage caused by the fires. This support encompasses local perspectives and interests (including those stemming from different

forest values). Amplifying this theme is an exchange with the contractor who is carrying out the work:

> *And so you're doing this work, 7,000 acres a year and it's prioritized how?*
>
> Well the Forest Service and I sat down and prioritize it together. They prioritize and then they have to do the NEPA [environmental compliance documentation]... They've gotten, they got like 60,000 to 70,000 acres of NEPA done with no objections from the environmentalists.

While others interviewed were not as exuberant about these relationships, these developments seem to signal that there are new working relationships and institutional arrangements at the local level concerning national forest management that can in large part be traced back to the Rodeo–Chediski fire.

The Impacts of the Fire on Future Preparedness

> Any time somebody sees smoke on the horizon and they went through the Rodeo–Chediski, it generates abject horror, I mean the emotional reaction is just amazing.

Interview results suggest the wildfire experience has changed some ideas concerning fire among residents in the communities affected. For instance, residents stated that their frustration over the evacuation and return processes used during the Rodeo–Chediski fire will affect their willingness to stay if another fire occurs. This is particularly important because although some people said that they will not evacuate, there is little indication that they will take the steps necessary to weather a fire event, as evident in the following passage from one resident:

> *So if it were an issue, what percentage of people in your mind would refuse next time?*
>
> I don't know, it would probably be a quarter [that would stay].
>
> *They would stay out of anger or... or would they stay out of because they are really prepared to stay ...*
>
> Prepared to stay, I think is way down there like 1 or 2%, but I think that the anger might be a little higher, but a lot of it they're just gonna stay until, then they're gonna have to... you know, really don't want to leave.

Positive outcomes from the fire include additional training and resources for local protection agencies and defensible space work carried out by residents. However, adoption of these changes has not been universal and many residents think there is still room for improvement. One resident said:

> The fire departments are working well together and that's a big [change] from the way it was 10 years ago. I mean [Centerville, Forestville, and Pioneertown], they're working very well together now. What I don't see

> is this preparedness [in] meetings between the Forest Service and BIA and the fire departments.

Officials also thought the increased focus on fire events is still falling short of ideal preparedness for future events. There is evidence that the Rodeo–Chediski fire raised local awareness concerning the risk of fire in forest ecosystems and the protective measures (e.g., thinning, improvement of residential area egress, etc.) needed to reduce them. However, it became clear that while some activities, particularly thinning, were undertaken in the 5 years following the fire, uniform protections are not in place and there is currently no enforcement of ordinances set by communities. The following is from a locally based extension forester who has worked on fire issues in the area for about 20 years and was asked what proportion of the needed fire safing has been completed in the area:

> Right now we are—the last time we checked . . . somewhere around 15 to 20% done . . . And it has to be maintained and that's a real hard thing to get across to people; that just because we've cleaned it up, in 5 years you have to clean it up again. They don't like that.

He and other informants indicated that the impact of the fire on resident awareness of risk or fire-safing activities also seems to be waning. Some residents have taken preparedness and risk reduction measures to protect their homes and properties, but the larger majority has failed to do so. Further complicating the issue of fire safing is the significant portion of seasonal residents who own homes in the area. One official said that these residents "could care less whether their home burnt or not," and prefer the aesthetic values of thick forests over thinning. This indicates there are a number of structural factors, as well as perceptions, that limit the communities' capacity to ensure readiness for future wildfires.

Discussion

One of the conclusions of the initial study was that social action and social structure both play pivotal roles in local conflict or cohesion resulting from the wildfire event. The results presented here suggest that over the past 5 years, the interactions local residents had surrounding the fire event and the social structures that enabled or constrained them have continued to play a role in the recovery of the Rodeo–Chediski communities, but in a different way than was observed immediately following the fire. We argue that these changes are the result of interactions (that is, the experiences and views of the event immediately following the fire) evolving into altered structure over time. This process began when the interactions residents had with each other and nonlocal entities during and after the Rodeo-Chediski Fire served to "disrupt" and "modify" their existing conceptions of community preparedness or response to hazard events. Giddens (1984) described such important social events as "critical situations" and said they often upset our confidence in the everyday functioning of the natural and social worlds around us (what he calls "ontological security"). The result of these disruptions (or perhaps the response) during the ensuing 5 years since the fire has been the continued renegotiation of personal and community experiences (positive and/or negative) and the conceptions people draw from in determining their future interactions (Aronoff and

Gunter 1992). Thus, these first disruptions continue to play a role in the community, not simply as a "knee-jerk" reaction to the initial destruction or disruption of the fire, but as the experience locals draw from in evaluating the social relationships in their community and their collective ability to deal with fire situations. Therefore, the long-lasting impacts of the fire are influencing current and likely future patterns of interaction in the community and between local and outside actors (Giddens 1984).

The changing social interactions and structures observed in the three communities studied here often took place at multiple levels. Interactions observed 5 years after a wildfire event reveal both strengths and weaknesses in local and nonlocal systems. Residual anger, disagreements, and uneven community capacity for effective collective action, as well as the persistent rationalization of disembedded management systems (i.e., the federal agencies involved in both fire response and recovery), all contribute to continuing challenges for these communities. At the same time, new capacities have been developed among some local organizations and formerly polarized groups and agencies. This provides further detail to the ever-more-nuanced understanding of how (and to what effect) disasters can trigger both longer term social conflict and cohesion at the local level (Flint and Luloff 2005; Tierney 2007).

In the present case, the transformation of the environmental conflict surrounding thinning activities in national forests is an example of conflict reduction. As is well known, environmentalists and forest industries have been in an institutionalized conflict over national forest management for more than a generation. But following the Rodeo–Chediski fire, it appears locally that the stewardship contract to thin forest stands incorporates patterns that could lead to new, potentially longer term communication and collaboration among these stakeholders. Although these changes would not be possible without shifts in federal law and regulation (Steelman and Burke 2007), they would also not be implemented without changing ideas and resulting practices (structure) at the local level, a number of which resulted from the Rodeo–Chediski fire event. If this trend continues, environmental compliance procedures, which have been an expensive and divisive battleground for decades (Daniels and Walker 2001), may give way to a more collaborative model. It may also signal rebirth of a potentially sustainable locally based forest industry, albeit a very different and smaller one than existed before. Although this change has apparently not yet appreciably shifted viewpoints of residents in communities that were once timber dependent, the potential for a longer term shift in interactions (perhaps generational) seem to be present.

Another example of this is the increased emphasis on fire safing and other preparations, however incomplete. A lack of effective structural mechanisms for effective communication, local incapacities wrought by rural geographies, and a mix of tribal, nontribal, long-time, and new, part-time residents are likely limiting opportunities there. The emergence of new social structure resulting from the fire and changing local perceptions is represented by the emergence and maintenance of new local groups and the reformulation of older ones to deal with problems such as cleanup, housing the displaced, coordination among local firefighting entities, and emergency preparedness.

A less hopeful sign is the continued resentment of many residents and local firefighters (particularly in Forestville) toward the federal firefighting teams and the Incident Command hierarchy. Although our results suggest that some of the younger leaders in local fire departments are a bit more favorably disposed toward the system

than their elders, these newer leaders have emphasized building *local* capacity in fire-fighting and emergency preparedness. While the latter is a constructive trend, it is fair to say that any federal incident command team coming into the area for a future fire event will likely be treated with suspicion by some local groups and fire departments due to longer term negative relationships created by interactions during the last fire event. The main issue driving these viewpoints appears to be local resentment over the fact that the incident commanders were seen as having little respect for local knowledge and no local accountability. Such viewpoints may reduce willingness to cooperate with federal officials or evacuate in a future fire event. Though reduced, the remaining local cultural conflict over the fire and particularly its ignition is another less hopeful sign.

Clearly, disaster events such as wildfires change some patterns in local communities affected and others remain more stable. A deeper understanding of such dynamics (and in particular the role of advanced preparation in mitigating longer term impacts when such events do occur) is arguably needed to help plan for and mitigate effects of such events, which seem likely to get only more frequent for the foreseeable future.

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