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Insight, part of a Special Feature on Exploring Social-Ecological Resilience through the Lens of the Social Sciences: Contributions, Critical Reflections, and Constructive Debate

Seeing the forest for the trees: hybridity and social-ecological symbols, rituals and resilience in postdisaster contexts

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ABSTRACT. The role of community-based natural resources management in the form of "greening" after large scale system shocks and surprises is argued to provide multiple benefits via engagement with living elements of social-ecological systems and subsequent enhanced resilience at multiple scales. The importance of so-called social-ecological symbols, especially the potent hybrid symbols of trees and their handling after a disaster is interrogated. The paper explores the notion of hybridity, and applies it to the hybrid symbol of the tree in postdisaster contexts. The paper briefly highlights three U.S. cases documenting the symbolic roles of trees in a context of significant shock to a social-ecological system: the terrorist attacks on New York City in 2001, the devastating hurricane that struck New Orleans in 2005, and the sudden tornadoes that wreaked havoc upon the small Midwestern city of Joplin, Missouri in 2011.

Key Words: *disaster; hybridity; resilience; social science; symbolism; trees*

INTRODUCTION

Recent explorations of the role of community-based natural resources management, in the form of "greening" after large scale system shocks and surprises (Tidball and Krasny 2013) argue that the multiple benefits of engagement with other living elements of social-ecological systems confers resilience at multiple scales. One common theme that emerges in these explorations is the importance of symbols, especially the potent hybrid symbols of trees and their handling after a disaster. In this paper I explore the hybrid symbol of the tree in postdisaster contexts, and argue that a fuller understanding of and appreciation for hybrid social-ecological symbols such as trees, or other living entities, may be a critical component in understanding the environment within which successful and sustainable postdisaster management is to occur. Though other green spaces such as community gardens are worthy of additional study from this standpoint, here the focus is specifically upon trees. I briefly highlight three cases wherein the symbolic roles of trees in a context of significant shock to a social-ecological system: the terrorist attacks on New York City in 2001, the devastating hurricane that struck New Orleans in 2005, and the sudden tornados that wreaked havoc upon the small Midwestern city of Joplin, Missouri in 2011.

Following from earlier work on greening mechanisms in disaster resilience (Tidball et al. 2010, Tidball 2014) and tree symbols in New Orleans (Tidball 2013), I take up the notion of hybridity, in its multiplicity of meanings and intents, to further describe hybrid symbols and rituals, what I have called "social-ecological symbols" and "social-ecological rituals" (Tidball 2013). As Joseph (1994) argues, theories of hybridity allow for invisible negotiation with structures of domination, such as encountered by residents in the three cases herein. In the spirit of Ebron and Tsing (1995), I found that in post-Katrina New Orleans for example, the "community" was no longer necessarily territorially enclosed, engaged in exclusively face-to-face interaction, "pure" in origin, or monolingual. Thus, in keeping with Ebron and Tsing (1995:127), "...with these defining characteristics gone, the dispersed, hybrid, polyglot community retains one central core of distinctiveness: its ability to compose itself around an *allegory*" (emphasis added). For post-Katrina New Orleans, the allegorical rhetoric of "rebirth" combined with the emergence of a distributed community of practice around planting symbolically and ritually powerful trees provides an interesting perspective of hybridity indeed.

I address material and nonmaterial cultural dimensions of social-ecological resilience via trees and tree planting, e.g. symbols, values, identities, and rituals, in the context of disaster, and suggest framing these dimensions in terms of the notion of hybridity. I rely on ethnographic field work and subsequent observations reported in depth elsewhere (Tidball 2012, 2013, Tidball et al. 2010) to further interrogation and integration of theories of symbol, ritual, ecological anthropology, and social-ecological system (SES) resilience, following from Van Gennep (1960), Turner (1967), Rappaport (1984), and Berkes and Folke (1998). In so doing I suggest that the hybrid symbol of the tree, the ritual of tree planting as a form of concurrent social-ecological recovery processes, and the resulting feedbacks and virtuous cycles contribute to SES resilience at multiple scales in postdisaster contexts. I acknowledge, then, that the relationships between human actors and other living elements in the social-ecological system of interest are dialectically engaged in more or less successful efforts to recover social-ecological structure and function, which include the above-mentioned symbols, values, identities, and so forth, and therefore the term recovery in this paper refers to these relationships.

I explore this position in three steps. First, I provide brief and general reviews of the extensive research on both the concept of hybridity and on the individual and community aspects of exposure to and interaction with trees and other plants as a foundation for this exploration. Second, I present a selective discussion of theories about symbols and rituals, especially related to trees. Third, with these literature reviews and theoretical concepts in hand, I briefly present three cases where the hybrid symbols of trees appeared in potent ways in postdisaster contexts. Finally, I conclude with a discussion of the importance of tree symbols and rituals in postcatastrophe resilience, with potential implications for other "red zones" (Tidball and Krasny 2013).

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LITERATURE REVIEW AND CONTEXT

Hybridity

Though the term hybridity is controversial, and has been "both trapped in the stigmatic associations of biological essentialism and elevated to promote a form of cultural nomadology" (Papastergiadis 2005:39), it is still a useful way of acknowledging and understanding the tensions created when potentially contradictory discourses overlap in hybrid spaces, which as Carter and Walker (2010) argue, can be generative in nature. Carol Brandt, for example, in her work with Navajo college students, describes these hybrid spaces as "locations of possibility" (Barnhardt et al. 2008). Carter and Walker (2010:342) note Pieterse's (2001) historical description of hybridity as "the common practices of mixing that have always existed in all human knowledge and practices." Tippins and colleagues point out that although reflecting on the way in which hybrid spaces and the changing knowledge and practices they entail contribute to a more dynamic understanding of mixing, there is a paradox. They caution that, in the natural world, if we hybridize too much, for example through the introduction of genetically modified organisms, there is an inherent danger that the hybridized spaces of species might actually become more terminal (Tippins et al. 2010).

As a socio-cultural concept, Papastergiadis argues, hybridity is often associated with the effects of multiple cultural attachments of identity or the process of cultural mixture (Papastergiadis 2005). He points out that both the effects and processes of mixture can also lead to a critical form of consciousness, and that these three levels of hybridity are interrelated. At the first level, hybridity is a reference to visible difference within identity resulting from the incorporation of foreign elements. The second level of hybridity refers to the process by which cultural differences are either naturalized or neutralized within a host culture. The degree to which this process of cultural mixture or hybridization has been consciously utilized has varied over time (Pieterse 2001). More recently, postcolonial theorists have adopted hybridity on a third level. It has been used as a perspective for representing the new critical and cultural practices that have emerged in diasporic life.

For the purposes of this paper, we are most concerned with the notion of hybridity thinking as being "driven by the dual desire of connection and separation," for as Papastergiadis (2005) argues, the creation of something new involves ripping it out of one particular context, pushing against existing boundaries, rearranging the order of things, all in a disruptive manner that can lead to new forms of awareness and construct new networks of agency. However, Papastergiadis cautions, in a statement highly apropos to this study, that when war or disaster breaks out, hybridity alone may not be enough, because history has shown that neither the material presence of hybrid symbols nor the perspective of cultural relativism is sufficient to offer a solution in times of calamity or conflict. He concludes that when violence erupts, the historical signs of hybridity offer little resistance, and yet, the resolution of conflict requires more than brute force, it demands a "creative modality for living with difference" (Papastergiadis 2005:62). The symbol of the tree and the ritual of planting trees, especially when in the context of pushing against boundaries and rearranging the order of things, is perhaps an example of such a creative modality for living with difference, the differentness of a changed landscape and sense of place in the wake of disaster or war.

The tree as hybrid symbol

Keeping in mind the importance of allegory as raised earlier, the tree is said to be one of humankind's most potent symbols (Fontana 2003). According to Davies (1989), the tree presents itself as a medium of thought through its possession of trunk, roots, and branches, and because it serves as a habitat for other creatures. Further, Davies argued that a tree may stand as "a living entity spanning many generations and therefore avails itself as a historical marker and social focus of events" (Davies 1989:34). The life of a tree lasting longer than human generations may provide an analogical resemblance between long lived trees and big families, and the life of a tree spanning from one generation to another facilitates trees being identified with the concept of "stability/immortality" (Daniels 1989). It is therefore easy to imagine how a tree could become a hybrid symbol, representing simultaneously both loss and rebirth.

Frazer, in his seminal work *The Golden Bough* (1915), was among the first to devote significant effort to understanding the symbolic use of trees by humans, though his understanding was later called in to question by other anthropologists (cf. Wittgenstein 2002). Other important figures in the field of anthropology, such as Victor Turner (1967), have also explored trees in symbol and ritual, because "...trees are used symbolically to make concrete and material the abstract notion of life [and are] ... ideal supports for such symbolic purpose precisely because their status as living organisms is ambiguous" (Rival 1998*a*:3), reflecting this notion of hybridity.

Trees as symbols are employed in multiple ways: to depict life cycle rituals, to make sense of the human body, to visualize kinship, and to express solidarity, continuity, and vitality of a community, among others (Rival 1998*b*). Trees as symbols often stand in opposition to the symbols of death and decay. It is this last expression I have focused on in work in New York, New Orleans, and in Joplin, how the symbolic elements of tree presence and tree planting contributed to the solidarity, continuity, vitality, and resilience of a community and the social-ecological system within which it resides (Tidball 2013).

In a study of residents affected by Hurricane Hugo, 30% of survey respondents identified trees as the most significant feature that was damaged by the hurricane, and cited positive emotions evoked by the urban forest, followed by the importance of trees in defining Charleston as a community or "place," as being particularly important. Hull (1992) concluded that the role of urban forests as symbols of cherished meanings and memories needs to be emphasized as a major benefit deriving from urban forestry. In New Orleans, I interviewed a community member, speaking about the importance of being involved in planting trees after Katrina. This person said that trees represent "...a symbol of our recovery of rebirth. Every time I pass a place where trees have been replanted it gives me hope." Whereas this and many other statements from disaster survivors provide testimony of the critical symbolic role of trees in the weeks and months immediately following disaster, research-based evidence for the role of trees in helping people and communities recover from disaster is limited.

Despite the relatively small number of studies specifically on the role of trees and tree planting in postcrisis ritual, symbol, or resilience, there is a considerable literature documenting people's opinions and attitudes regarding the meanings and values of trees generally (Gorman 2004). Studies have focused on attitudes toward specific species of trees (Sommer et al. 1990, Schroeder and Ruffolo 1996, Anderson 2004), and residents' attitudes and behavior regarding tree planting and care (Summit and McPherson 1998). Based on the results of research in Chicago Illinois, Dwyer et al. (1991:276) argued for an approach to urban forestry that "takes into consideration the deep psychological ties between people and urban trees and forests." Similarly, Appleyard (1978) described multiple historical instances where trees served as "anchors of stability in the urban scene" (Smardon 1988:94) Perceived economic benefits (Daily 1997), social benefits (Coley et al. 1997, Westphal 2003), symbolic importance (Smardon 1988), and psychological value (Ulrich 1983, 1984, 1993, 1999, Hull 1992, Perlman 1994) of trees and other greenery also have been documented. Trees have symbolic importance well beyond the Western influenced academic studies mentioned here as well, to include important social-ecological movements that have protected or planted trees, such as the work of ecofeminist Vandana Shiva (see for example 1989, 2006) and the work of political activist and environmentalist Wangari Maathai (see for example 2004*a, b,* 2011).

Anecdotal and research-based evidence for the role of trees and other greenery or plants in human and community well-being, especially in Western contexts, is particularly well-documented. On an individual level, gardening or the ability to see or experience green space is reported to help people recover from grief (Relf and Dorn 1995, Relf 2005, 2006), deal with the trauma of war (Helphand 2006, 2013), reduce domestic violence (Sullivan and Kuo 1996), quicken healing times and reduce stress (Ulrich 1984), improve physical health (Tennessen and Cimprich 1995), reduce poor birth outcomes (Donovan et al. 2011), and bring about cognitive and psychological benefits for children and adults (Kaplan 1973, Kaplan and Kaplan 1989, Faber Taylor et al. 1998, 2001, Wells 2000, Wells and Evans 2003). These individual benefits may result in positive impacts on organizations and communities including increased worker productivity (Kaplan 1993), potentially increased consumer traffic and thus purchases in business districts (Wolf 2003), increased property values resulting in greater municipal revenues (Wachter 2005), and creating a sense of connectedness to the community and thus reducing crime (Kuo et al. 1998).

Dwyer et al. (1991) distinguished between the meanings or impacts of trees per se and the act of tree planting in their study of urban residents in Chicago. According to these scholars, "commitment to tree planting suggests that it has benefits in and of itself that go beyond the expected benefits of the resulting trees" (Dwyer et al. 1991:282). Possible explanations for this strong commitment to tree planting include: (1) the value of tree planting as a demonstration of commitment to the future, (2) the act of tree planting as a significant impact on the landscape over time, and (3) tree planting as a means of improving the environment (Dwyer et al. 1991). Similarly, Miles et al. (1998) examined the individual level impacts of engagement with nature through participation in volunteer natural area restoration efforts in Chicago, and found that those volunteers who were more active experienced greater satisfaction. According to these researchers, "restoration is a form of involvement with nature that combines the benefits usually associated with nature activities with the benefits associated with volunteer conservation and leisure activities" (Miles et al. 1998:59). Lohr and Pearson-Mims (2006:685) conclude their study of urban tree preference with the boldly unequivocal statement "Human well-being can be improved by planting trees of any form."

There are examples of symbols such as trees and forests and their planting or removal being used for less than benevolent purposes, or contributing to red zones rather than ameliorating them (Guha 1989, Fairhead and Leach 1996, Scott 1998, Cronon 2003, Prudham 2004). Perhaps a most salient example exists in the Israel/Palestine territorial conflict where, according to Braverman (2009) there are two dominant and highly symbolic tree landscapes; pine forests and olive groves. The pine tree is associated with Zionist afforestation of the Promised Land, while the olive tree symbolizes the long agricultural connection to the land held by Palestinians (Braverman 2009). In his book Braverman describes the story of trees through the narratives of military and government officials, architects, lawyers, Palestinian and Israeli farmers, and Jewish settlers, including cases of trees actually being targeted by military forces, removed, and destroyed, in some cases repeatedly. He says succinctly:

> *...in this pitting of the pine tree and its people against the olive tree and its people, a discursive and material split is constructed with dogged determination by the two national ideologies that compete in and over the landscape of Israel/Palestine, so that these two tree types assume the totemic quality of their people, reflecting and reifying the standing conflict* (Braverman 2009:165).

In this conflict the tree's role as an "ultimate connotator of land" is indisputable, because "anything connected to land in Israel/Palestine is also strongly aligned with national affiliations" (Braverman 2009:218); in such a case it is not surprising that trees hold such tremendous national symbolic power, and that the hybrid nature of trees as symbols is so palpable. Similarly Perlman (1994) concludes:

> *... the connection between trees and the military imagination needn't always lead to an embrace of literal militarism and national chauvinism ... yet the presence of trees ... can be involved with and invoked by reactionary nationalistic and political movements and lend vitality to authoritarianism and mass violence* (Braverman 2009:108).

The above caveats notwithstanding, the testimony of disaster survivors reported by the media, and studies on the symbolic power, health, and community value of trees and other greenery, together provide strong support for a hypothesis regarding the importance of trees and tree planting in societal, and ecological, responses and recovery from disaster. Recalling the recognition by the Resilience Alliance (http://www.resalliance.org/index.php/resilience) that "resilience in social systems has the added capacity of humans to anticipate and plan for the future," it is important to keep in mind that though people do not have the ability to decide what is destroyed by a disaster, they do have the ability to decide what is reconstructed (Miller and Rivera 2007). Therefore, that which is reconstructed, like green spaces or an urban forest,

symbolizes the cultural, social, political, and ecological ideals that the society values and wants to transmit (Foote 1997, Baker 2003, Tidball et al. 2010).

SYMBOLS, RITUALS, TREES, AND HYBRIDITY: THEORETICAL CONSIDERATIONS

The origins of studies of symbols and rituals are found for the most part in the field of anthropology. Since its inception, the field of anthropology has concerned itself "as much with the ways in which natural processes are conceptualized and the natural world classified, as with the ways in which human societies interact with their natural environments and use natural resources" (Rival 1998*b*:1). The relationship between natural environments that feature trees and rituals and symbols is well described in anthropology, from classics like Victor Turner's milk tree in *The Forest of Symbols* (1967) to more recent explorations by Rival, Brosse, and others in *The Social Life of Trees* (1998*b*). Trees as symbols often appear in life cycle rituals or are used as kinship models, and are frequently seen deployed as images of continuity and reproduction as contrasted to images of change and destruction (Rival 1998*b*). Trees can also be used to symbolize other values within the built environment (Egenter 1981, Nute 2004). For example, current research in fields of horticultural therapy, natural resources management, city and regional planning, and SES resilience acknowledge both biophysical and cultural aspects, such as ritual, symbol, sense of place, etc., to trees in urban contexts.

Renowned social scientist and founder of American anthropology Franz Boaz (1935:169) characterized the symbolic use of trees in Kwakiutl mythology succinctly with his observation that "the trees appear personified." But as Perlman (1994) points out, applying Boaz's observation to tree symbolism more broadly does not necessarily imply literal animism. Instead, as Perlman indicates, we can think in James Hillman's (1975:13) terms, in that speaking of trees as persons is part of giving a place to the psyche's propensity to personify as a way of defining what or whom is felt as valuable, powerful "as a necessary mode of understanding the world and of being in it."

Symbols

In an earlier study of ritual and symbol in rural Appalachia, my colleague and I describe how the study of symbols and symbolism is both interesting and problematic because a symbol is, by definition, something that stands for something else (Tidball and Toumey 2003, 2007). The field of study dealing with rituals and symbols asks many questions, but the two most prominent are: (1) What does a particular symbol stand for, that is, what is the idea or the thing behind the symbol? (2) How does a symbol represent something else? Firth describes the systematic and empirical features of 20th century anthropological studies (Firth 1973) in his historical account of theories concerning symbols and symbolism. Two characteristics are especially important. The first is that the study of symbols is usually centered on ritual, defined here as patterned (or routine) collective symbolic behavior. With this understanding, one can observe and describe the repetitive and predictable aspects of a ritual, and avoid dealing with isolated or idiosyncratic symbols. Given that a ritual is an instance of collective behavior, one expects some common understanding among participants of what the various symbols are supposed to represent. By treating a symbol as a phenomenon that occurs repeatedly and systemically in a regular pattern, and by deriving the abstract signified from the interpretations of multiple participants, the ritual-centered approach gives a good empirical grounding to the study of symbols and symbolism.

The second important characteristic is that anthropological approaches to understanding symbols rely on Ferdinand de Saussure's linguistic theories from his book, *Course in General Linguistics* (1966). Saussure taught that a symbolic relationship includes "signifieds," that is, ideas that are best expressed by devices such as words, and "signifiers," which are the devices used to represent an idea. Ideally, the signifier constitutes a clear, direct, and faithful representation of the signified, in which case the two together are called a sign. More commonly, however, sensory signifiers, words, i.e., emblems, images, slogans, objects, and so forth, cannot entirely represent abstract thoughts, if only because the sensory can never be equivalent to the abstract.

From symbols to social-ecological symbols and rituals: symbolic hybridity

Going deeper into theories of ritual and symbols related to trees requires an understanding of ritual and symbolic analysis. I will limit discussion on ritual and symbolic analysis predominantly to that of the approach developed by Victor Turner. Turner's (1967:19) oft-cited definition of ritual is a "prescribed formal behavior for occasions not given over to technological routine, having reference to beliefs in mystical beings and powers." Elsewhere he elaborates that a symbol is "the smallest unit of ritual which still retains the specific properties of ritual behavior" or a "storage unit" filled with a vast amount of information (Turner and International African Institute 1968:1-2). Symbols can be located in objects, activities, words, relationships, events, gestures, or spatial units (Turner 1967). So then, rituals can be understood as storehouses of meaningful symbols by which information is revealed and regarded as authoritative, as dealing with the crucial values of the community (Turner and International African Institute 1968, Deflem 1991). However, symbols reveal more than crucial social and religious values. They are also transformative for human attitudes and behavior, and therefore the handling of symbols in ritual exposes the power of symbols to act upon and change the persons involved in ritual performance (Deflem 1991).

Here I put forward a special category of symbols, hybrid social-ecological symbols, which are related to the concept "nested ecologies" (Wimberley 2009) and are a natural outgrowth of social-ecological systems, the concept of integrated "humans-in-nature" systems (Berkes and Folke 1998). Environmental or ecological symbols (Appleyard 1979, Kroll-Smith and Couch 1993), a subset of symbols generally speaking, use biophysical elements in nature to represent an idea. For example, a tree may represent rootedness. I define a social-ecological symbol as a hybrid symbol or "storage unit" containing both social and ecological meanings, and also, more importantly, social and ecological interactions. Tree planting events or activities are social-ecological symbols. There is an ecological entity, trees, and a social activity, planting trees, which together communicate an idea. Social-ecological symbols, such as communities planting trees after their city is damaged by a terrorist attack, hurricane, or tornado can then, in the aggregate, be thought of as hybrid social-ecological rituals, storehouses of meaningful social-

ecological symbols by which interrelated social and ecological information is revealed and regarded as authoritative, and is thought of as dealing with the crucial values of the community. These hybrid social-ecological symbols and social-ecological rituals can then be seen as sources of resilience and catalytic in the aforementioned resilient systems that appear to have learned to recognize feedback, and therefore show promise to act as "*mechanisms* by which information from the environment can be received, processed, and interpreted" (Berkes and Folke 1998:21, emphasis added).

CASE STUDIES

New York City 2001

On September 11th, 2001, terrorists attacked the World Trade Center in lower Manhattan causing massive damage to the building complex and significantly altering the security discourse in the U.S. and internationally. Thousands of families were impacted by the disaster, and the event registered as a significant trauma to the collective psyche of the U.S. and other nations. Among the many responses to the 9/11 tragedy, there were a number that were characterized by "greening" (Svendsen and Campbell 2005*a, b,* 2013, Tidball et al. 2010).

Examples of the power of trees as symbols began to emerge soon after the event. There were stories of the importance of the sycamore trees that shielded and protected St. Paul's chapel, including a 100 year old tree that stood in the northwest corner of the churchyard. The tree was toppled on September 11th, 2001 when the collapse of the World Trade Center sent tons of debris hurtling toward the church. The chapel's trees shielded it from damage and "not a single pane of glass was broken throughout the church." (Fig. 1). The trees roots were turned into a sculpture which is on display to this day. Memorialization via tree planting soon began to occur in the New York City environs, and beyond, as documented by the Living Memorials project (http://www.livingmemorialsproject.net/; Fig. 2).

These memorials were explicit in evoking the hybrid social and ecological meanings of trees, especially in the context of great tragedy. For example, the "tree of hope" at St. Paul's Chapel was dedicated as "a reminder and affirmation of the power of love in the face of tragedy" (Fig. 3). These memorialization instances of greening practices reflect a "greening memorialization mechanism" (Tidball et al. 2010, Tidball 2014), which begins right after a crisis, when spontaneous and collective memorialization of lost family members or community members through gardening, tree planting, or other greening practices happens. Then a community of practice emerges to act upon and apply these memories to social learning about greening practices. This, in turn, may lead to new kinds of learning, including about collective efficacy and ecosystem services production, through feedback among remembering, learning, and enhancing individual, social, and environmental well-being. It also can lead to greater awareness and effort to restore important social-ecological patches, such as urban forest patches, and to recover, reclaim, or even revise place meanings.

New Orleans 2005

Because of rapid wetland loss since the first half of the 20th century, New Orleans' infrastructure and population are said to be more vulnerable to hurricane-related storm surges than they

Fig. 1. Interpretive sign near "Ground Zero" serves as example of tree symbolism in the form of repurposing dead and downed trees in the wake of disaster, alluding to the hybrid nature of tree symbols. Photo: K. G. Tidball.

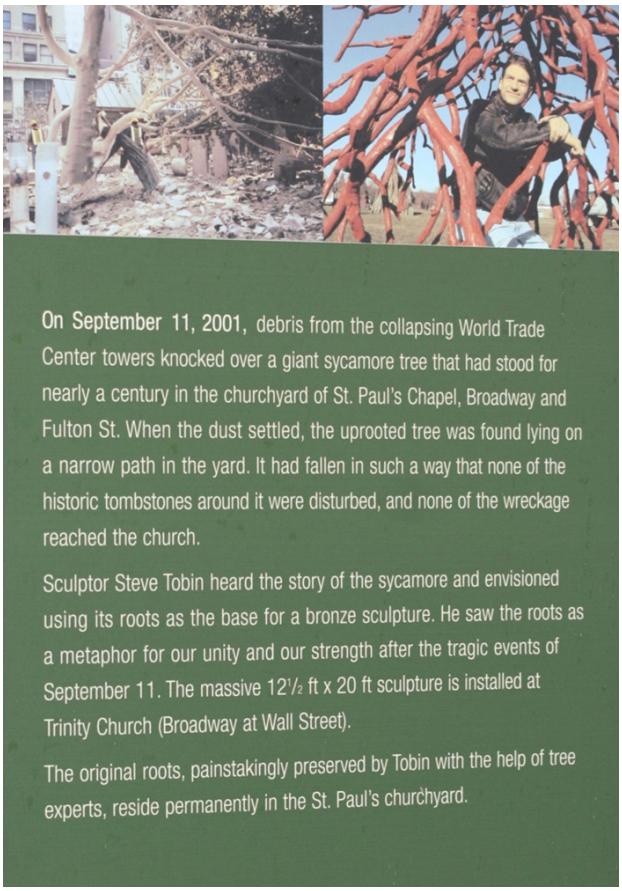


Fig. 2. Screen capture of Living Memorials from 2001 to 2004, showing locations throughout the U.S., as well as spikes in reported memorials in September of each year. Image courtesy U.S. Forest Service. http://www.livingmemorialsproject.net/registrymap.htm

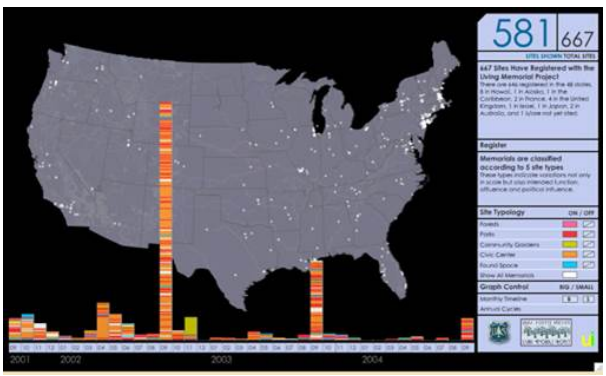


Fig. 3. Tree of Hope interpretive sign near "Ground Zero." Photo: K. G. Tidball.

were in the past (NRDC 2011). The scientific consensus is that every 2.7 miles of coastal marsh lost between solid land and open water add one foot to the height of a storm surge reaching solid land (U.S. Army Corps of Engineers 2000). Also, loss of urban tree canopy and coastal trees can compound the effects of less buffering of storm surge and consequentially large inflows of storm wind and water (Harada and Imamura 2005, Nowak and Dwyer 2007, Cochard et al. 2008).

Evidence of this was experienced when Hurricane Katrina made landfall in New Orleans, Louisiana on August 29th, 2005. The story of New Orleans' struggle to endure weeks of inundation and devastation, and months of disorganized efforts to recover from the disaster, is well known (White House 2006, Waugh 2006, Brunsma et al. 2007). However, the important symbolic roles of trees and the act of replanting them in post-Katrina New Orleans, Louisiana (NOLA) as part of the disaster recovery discourse are less well known.

New Orleans is said to be home to some of the largest collections of mature trees in the world, containing nearly 50 species, including magnolia, pine, live oak, bald cypress (Louisiana's official state tree), and red maple (Goudarzi 2006). Historically trees have held special symbolic significance to residents of New Orleans, contributing to identity and sense of place (Anderson 2004, Greenfield Boyce 2005, Kearns 2006, Chamlee-Wright and Storr 2009). City Park in New Orleans boasts the largest collection of live oak trees (*Quercus virginiana*) in the world (New Orleans City Park 2005), 249 of which are registered with The Live Oak Society, an organization founded in 1934 to promote the "culture, distribution, preservation and appreciation of the Live Oak tree" (http://www.lgcfinc.org/live-oak-society.html).

Based on extensive fieldwork in New Orleans (Tidball et al. 2010, Tidball 2012, 2013), content analysis of transcripts of interviews of New Orleans residents and photo essays by residents revealed that they have internalized multiple symbolic meanings of trees in different contexts. To make sense of this complex array of meanings of trees, the multiple symbolic meanings have been combined into intuitively formed broad families or types of symbols, and into general categories of meanings derived through multiple coding "passes" through the transcripts (Fig. 4). Multiple instances of a particular meaning appearing in a text were counted, even when articulated by the same person more than once. This research indicated that there are three broad families of symbolic meanings of trees: (A) trees themselves as symbols, i.e., their presence, their absence, their status; (B) tree planting as a kind of symbol or symbolic action; and (C) both trees and tree planting explicitly combined in the discourse. There are 20 general categories of symbolic meanings of trees and tree planting, representing more than 70 specific and nuanced types of symbolic instances. These categories of symbolic meanings can be further separated into positive-meaning and negative-meaning groups based on textual analysis of interview data (Fig. 5). A neutral group was originally included, but little if any evidence emerged indicating the usefulness of this category.

These data not only indicate a strong set of symbolic values involving trees and tree planting, they also indicate a duality at work, suggesting the hybrid nature of the symbols trees themselves. Trees can symbolize both life and death simultaneously, while operating as both socio-cultural phenomena and ecological biophysical entities.

Joplin, Missouri 2011

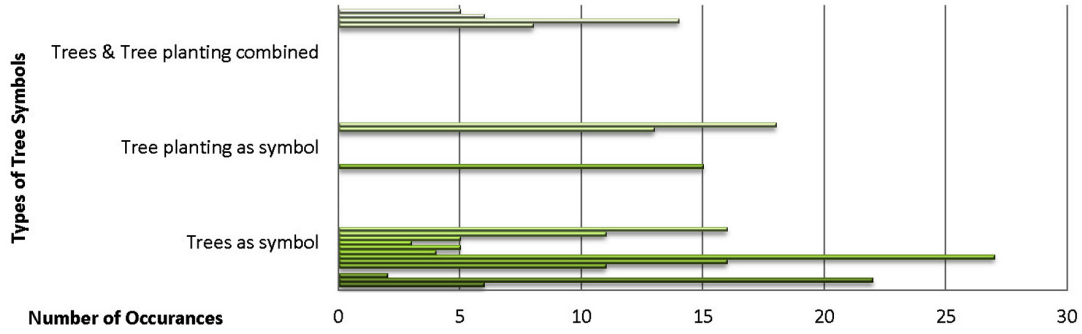
On 22 May 2011 the small Midwestern city of Joplin, Missouri endured an EF5 tornado, the deadliest in U.S. history since 1947, that suddenly cost 161 lives and millions of dollars in property damage. In addition to devastated homes and infrastructure, Joplin's urban forest was destroyed in this disaster (at least 10,000 mature trees were lost). This urban forest was part of the everyday landscape that refreshed residents on a daily basis and contributed to a local sense of place. Government agencies and community groups have since committed to creating a sacred green space where the tornado touched down at Cunningham Park, a beloved open space that became the city's first park in the late 1800s. Since the tornado, the nine-acre park has been a meeting place and rallying point, serving as the site of the one year memorial tribute, among many other functions. City officials responded to the grief over lost family members coupled with the grief over destroyed trees and initiated a planting program in Cunningham Park to plant one tree for every lost human life (Fig. 6); the final tree was planted on the one year anniversary of the storm.

People in Joplin felt the loss of their trees deeply, and were disturbed by the visceral "tree corpses" still standing throughout the city. These trees, stripped of branches and bark by the force of the tornado, generally died. However, some survived and became inspirations to "never give up," while others were "repurposed" as hopeful and cheerful community art installations (Fig. 7).

DISCUSSION

The relationship between humans and trees, the symbolic meanings of trees as objects and the meanings associated with their planting and care in the wake of a disaster, and the implication of these symbols and interactions on the resilience of perturbed SES is the subject of this paper. As described earlier, rituals can be understood as storehouses of meaningful symbols by which information is revealed and regarded as authoritative, as dealing with the crucial values of the community (Turner and International African Institute 1968, Deflem 1991). In post-Katrina New Orleans, reforestation activities emerged as rituals

Fig. 4. Categories of tree symbolism as reported by residents of New Orleans after Hurricane Katrina.



	Trees as symbol	Tree planting as symbol	Trees & Tree planting combined
memorials	6		
sense of place icons	22		
rescuer or refuge	2		
visual communication			
life & growth	11		
hope, commitment, future	16	15	
survival, stability, strength, longevity	27		
therapy	4		
sign of return to normalcy	5		
falling = fear/terror	3		
fallen down	5		
damaged	11		
removal	16		
means of beautifying		13	
public service		18	
positive landscape impact			8
improve environment			14
educational			6
liability, risk, hazard, gentrification			5

by which information that represented a counternarrative to news media and others who spoke of New Orleans as a "failure of resilience" (Westrum 2006) was revealed and regarded as authoritative. In New York, in post-Katrina New Orleans, and in Joplin, reforestation rituals acted as storehouses of multiple meaningful tree symbols dealing with crucial community values and concepts such as place attachment and sense of place, resilience and resistance, hope and commitment, and survival and stability. However, tree planting rituals and the symbols contained in them reveal more than crucial social values. They are also transformative for human attitudes and behavior, and therefore the handling of tree symbols in ritual exposes the power of tree symbols to act upon and change the persons involved in ritual performance. Residents in the cases presented may have been

Fig. 5. Positive and negative symbolic meanings of trees in post-Katrina New Orleans.

Fig. 6. Memorial trees planted in Cunningham Park, Joplin, Missouri after 2011 tornado. Photo: K. G. Tidball.

attracted to tree symbols and rituals for various reasons such as biological impulses combined with socio-cultural phenomena, for instance, recalling social-ecological memories (Barthel et al. 2010), involvement in memorialization mechanisms (Tidball et al. 2010), or the clear connection of trees to notions of stability and rebirth. The cases summarized here suggest that subsequent participation in tree planting rituals appears to change the persons involved such that they experience renewed hope, optimism, and sense of commitment to their neighborhood and to their city, important indicators of community resilience. I have documented how New Orleans residents organized around a particular area of knowledge and activity (trees and tree planting) and developed or reconstituted rituals and symbols that at once reinforced and reinvented the accumulated knowledge of the community via a distributed community of practice centered on trees and tree planting after Katrina (Tidball 2013). This, I argue, contributed to enhancing a sense of joint enterprise and identity, and therefore contributed to the resilience of the New Orleans social-ecological system. This appears to have been the case in New York City and in Joplin as well, where residents also continue to plant and steward trees, directly adding to the biomass, future urban tree canopy, and the potential capacity of the urban social-ecological system to produce critical ecosystem services (Lu et al. 2009). In so doing tree symbols, tree planting rituals, and those involved in them simultaneously present both a source of and a demonstration of individual, community, and social-ecological system resilience.

Fig. 7. Depiction of the transformation of debarked trees in Joplin, Missouri from depressing reminders of tragedy to hopeful statements of rebirth and recovery. Photo: K. G. Tidball.

Synthesis of the cases presented here describes trees as symbols with multiple and interrelated meanings, and describes tree planting rituals as outgrowths from these tree symbols, which gives credence to the hypothesis that the presence of tree symbols and tree rituals is of importance to resilience and the process of recovering from a specific disaster or crisis. This is not to say, in a normative sense, that tree planting efforts are always good, and cannot be coopted or commenced for other less desirable purposes, especially in time of great upheaval such as disasters or war (see earlier reference to Braverman 2009). There is a large and growing literature that makes disturbing connections between "greening" activities such as tree planting and gentrification and/or displacement (see for example Checker 2011, Eckerd 2011, Gould and Lewis 2012, Sandberg 2014). Though from an environmental justice perspective this outcome is to be avoided at all costs, an unfortunate consequence of this thinking is that creation of new boundaries between humans, especially of a certain class or ethnicity, and the rest of the social-ecological systems within which we reside, perhaps unwittingly, reinforces the most poisonous dichotomy of all, that humans are separate from so-called nature (Harvey 1997, Castree and Braun 2001). This can be interpreted to mean that to avoid gentrification, one should shun social-ecological yearnings, as manifested by symbols and rituals, to include trees and tree planting. So goes the proverbial baby with the bathwater. Thankfully, examples such as the aforementioned work of Dr. Maathai exist to provide a helpful counterpoint to this important critical line of thinking, in that the Greenbelt Movement and the symbols and rituals around tree planting were instrumental in drawing attention to political oppression and enabling greater democratic rights, especially for women, in Kenya. In this sense, then, the tree and tree planting represent powerful symbols and rituals, that are neither always good or always evil, but can be both or neither, that is, hybrid.

A word must also be included regarding social phenomena such as economies, especially within the ecological economics context as understood via the concept of ecosystem services. Here, trees again appear to occupy a hybrid status, as evidenced by arboreal elements serving as at once (arguably) providers of supporting services, provisioning services, regulating services, and cultural services (Lu et al. 2009, TEEB 2010, Phillips et al. 2012). The cultural ecosystems services discussion, whether about trees, or about many other symbolic entities from single beings to entire landscapes, belies the challenge of hybridity itself, as earlier discussed. For example, although some genuinely engage in the complex intellectual gymnastics of trying to value or monetize cultural ecosystem services (Daniel et al. 2012*a*), others dismiss the mere existence of such a construct out of hand (Kirchhoff 2012). To put a point on this, the authors of the original piece challenged by Kirchhoff replied to his critique by acknowledging

that they "... are not willing, a priori, to define cultural values out of the ES [ecosystem services] framework at the expense of further marginalizing their contributions to the full range of benefits ecosystems provide to people" (Daniel et al. 2012*b*), in essence allowing space for "pushing against existing boundaries, rearranging the order of things," as previously described.

Based on the cases presented herein, and the exhaustive studies behind them, tree symbols and rituals, and how tree symbols and rituals are remembered, reconstituted, and reproduced, represent a cluster of social mechanisms that can be viewed as "tangible evidence of social mechanisms behind social-ecological practices that deal with disturbance and maintain system resilience" (Berkes and Folke 1998:21-22). For cities to continue to build resilience through the experience of the disturbance of attacks or extreme weather events, multiple cross-scale activities are required (Ernstson et al. 2010), but for this to occur, sufficient memory from both ecological and social sources for reorganization must be present (Berkes and Folke 2002). Thus, I argue, the constellation of social-ecological memories, social-ecological symbols and rituals, the resulting relationships between human actors and other system components, feedbacks and cycles catalyzed by these relationships, and so on, all contribute to system memory, processes involved in "regeneration and renewal that connect that system's present to its past" (Gunderson et al. 2002:264) and aid in conferring resilience.

CONCLUSIONS

The intent of this paper was to describe trees as symbols and tree planting rituals, and to describe the importance of the presence of tree symbols and tree rituals to the process of recovering from a specific disaster or crisis, as represented by three separate cases. Further, I endeavored to delineate the role of the relationship between individuals or communities and trees and forests, especially in symbolic and ritualistic terms, as an important part of individual or community recovery, and of the resilience of the social-ecological system within which human individuals and communities are embedded. The presence of tree symbols, the social-ecological memories that define them and that inform the rituals that perpetuate them, and the resulting social-ecological relationships between people and trees or forests, as expressed through symbols and rituals, reveals a possible source of resilience in this kind of SES undergoing rapid change.

The broader implication of such a conclusion is that the constellation of social-ecological memories, social-ecological symbols and rituals, the resulting relationships between human actors and other system components, feedbacks and cycles catalyzed by relationships among trees, forests, and humans, all contribute to regenerative system memories, that form a bridge from that system's present to its past (Gunderson et al. 2002). When a system "remembers" system properties, such as human-nature interactions that produce, restore, and enhance mutually beneficial outcomes for biophysical and psychosocial elements of the system, and those system memories are subsequently reified through social-ecological symbols and social-ecological rituals, a unique possibility for social-ecological system resilience is introduced. Human-nature interactions, particularly those of a class of human-nature interactions called civic ecology practices (Tidball and Krasny 2007, Krasny and Tidball 2012) such as community reforestation, enhance the ability of people in disaster contexts to organize, learn, and act to increase their capacity to withstand, and even grow from, rapid change and uncertainty through nurturing cultural and ecological diversity, through creating opportunities for civic participation or self-organization, and through fostering learning from different types of knowledge.

The research and policy implications and questions of a conclusion such as the above are multiple. Are the findings from these three cases generalizable? I would answer maybe, and we need to continue working to find out. Clearly there is a need for further study of disaster contexts where this or related phenomena may be observed and better understood. If this phenomenon is recurring, what and how might policy makers plan differently in terms of inevitable disasters and potential conflict? The importance of rapid responses to facilitate ecological discoveries from major disturbances has been well argued (Lindenmayer et al. 2010). However, the corresponding importance of rapid responses to facilitate social-ecological system discoveries from major disturbances, including documenting human-nature interactions such as the importance of trees and tree-planting as symbols, rituals, and the formulation of communities of practice with broad ramifications for SES resilience, is only recently beginning to be discussed. It is my hope that this exploration of the symbols and rituals that emerged around trees in the recovery of New York, New Orleans, and Joplin will add something of value to such discussions.

Responses to this article can be read online at:
http://www.ecologyandsociety.org/issues/responses.php/6903

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