

Chapter 3

Peace Research and Greening in the Red Zone: Community-Based Ecological Restoration to Enhance Resilience and Transitions Toward Peace

Keith G. Tidball

Abstract A growing network of social and ecological scientists argue that change is to be expected and planned for, and that identifying sources and mechanisms of resilience in the face of change is crucial to the long-term well-being of humans, their communities, and the local environment. This ‘change’ can include armed conflict and civil unrest, especially as access to resources is constrained. Yet, several gaps in the resilience literature persist, including (1) a lack of studies focused on cultural systems (Wright/Masten 2005) related to change and conflict, (2) relatively few studies that explicitly re-embed humans in ecosystems in the overlapping contexts of security, sustainability, equity and peace, and (3) a need for more studies that integrate the theory and science of individual human resilience with broader ecological systems theory and research exemplified by social-ecological systems resilience scholarship (Masten/Obradovic 2008). The chapter engages the call for identifying sources and mechanisms of resilience and introduces five mechanisms in an attempt to address identified gaps in the resilience literature, and to further efforts to better understand and utilize community-based ecological restoration in enhancing resilience and transitions toward peace.

Keywords Community-based ecological restoration • Environmental security and peace-making • Greening in the red zone • Mechanisms of resilience • Resilience • Social-ecological systems • Sources of resilience • Transitions

3.1 Introduction: The Birth of Environmental Security

The intersection of peace studies and environmental studies, and, more specifically, the potential of the ecosystem to support peace stems from developments within ecological studies that set the stage for extending its scope to include issues

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of conflict analysis and peacebuilding (Kyrou 2007). Kyrou explains that while environmental conflict resolution had been an essential part of the environmental studies field for several decades, understanding the implications of the environment in terms of international security and peacebuilding has only been explored since the late 1980s when the concept of environmental security emerged.

In the 1980s and 1990s, a series of publications (cf. Baechler and Spillmann 1996; Homer-Dixon 1991; Homer-Dixon and Blitt 1998; Myers 1993) opened a debate on the link between the scarcity of environmental resources and regional conflict, which led to the eventual development of environmental security as a sub-field in political science, and several scholars and researchers focused on identifying regions of the planet where environmental scarcity could trigger instability and threaten regional and global security (Klare 2001). Homer-Dixon (2001) argued that only under very special circumstances is the environment, on its own, a *source* of violent conflict. Eventually environmental scarcity was determined to play an important role in escalating existing conflicts to violence (Peluso and Watts 2001), though Baechler (1998: 38) previously hinted at this nuance and at the time pronounced that there was "...ample evidence that future environmental conflicts and their intensification and geographical expansion can only be avoided, or at least mitigated, when peaceful problem-solving and resource management are successfully implemented". Finally, in the twenty-first century, environmental security can be seen to have matured as a field of study, as indicated by theoretical debates and suggestions for multiple phases of research in the area (Dalby 2002; Dalby et al. 2009; Brauch et al. 2011). As Kyrou observes (2007), though the work of Homer-Dixon and others remained focused on the environment as a source of contention, it also prepared the ground for a variety of different and new understandings on how the environment might relate to conflict.

3.2 From Environmental Security to Environmental Peacemaking

A recent and important example of such a new understanding is the work by Conca and Dabelko (2002). While conflict and violence continue to dominate the environmental security discourse, research focusing on environmental peacemaking has challenged the assumed link to conflict. These scholars suggest that "environmental cooperation can be an effective general catalyst for reducing tensions, broadening cooperation, fostering demilitarization, and promoting peace" (Conca 2002: 9). They examine the effectiveness of environmental peacemaking through case studies in six regions: South Asia, Central Asia, the Baltic, Southern Africa, the Caucasus, and the U.S.-Mexico border. While the authors admit that these areas vary dramatically, environmental peacemaking suggests that their highly fluid security situations all create opportunities for environmental cooperation to galvanize peacemaking. Further, they argue that: (1) substantial potential for

environmental peacemaking exists in most regions; (2) environmental cooperation can enhance trust, establish habits of cooperation, forge cooperative trans-societal linkages, and create shared regional norms and identities; and (3) civil society is a crucial but underutilized component to environmental peacemaking.

Given these arguments, and despite some scepticism about whether or not environmental cooperation can lead directly to peace, it behooves us to continue to explore the environment's potential as a peacemaking asset in a continually unstable and conflict-laden world. According to Erika Weinthal (2004), three areas deserve our attention. She asks:

- Are water resources more likely than other resources to provoke conflict and/or engender peace? Intentionally or not, Conca and Dabelko (2002) largely focus on water. Are other environmental resources also positioned to foster peace?
- Most of the security threats that emerged in the 1990s are or were intrastate threats (e.g. civil war, genocide, political instability, and state collapse), suggesting that we should focus on this lower level of analysis. Could we use the environment as a peacemaking tool within states and along tenuous border regions?
- Can researchers, policymakers, and practitioners move away from conflict scenarios and environmental peacemaking towards environmental peacekeeping? To date, the environment has largely been promoted as a mechanism to mitigate hostilities and therefore bring about peace; yet, the environment might also offer opportunities in the post conflict resolution phase to sustain a fragile peace and prevent a return to violence.

3.3 Greening in the Red Zone

In response to Conca and Dabelko's promising propositions of environmental peacemaking and Weinthal's subsequent questions rises the concept of *Greening in the Red Zone* (Tidball and Krasny 2013). Put simply, greening in the red zone can be understood as post-crisis, community-based interaction with and stewardship of nature that serves as a source of social-ecological resilience for individuals, communities, and larger social-ecological systems. Greening in the red zone presents a framework to further explore peace research and community-based ecological restoration to enhance resilience and transitions toward peace. Thus far, this framework has been used to document and understand greening in multiples types of red zones (Fig. 3.1), but not yet explicitly in the context of ecology and peace.

This chapter will explicitly apply the concept of greening in the red zone to the field of peace ecology. After briefly describing terms, the chapter pivots to an emphasis on five proposed mechanisms that provide insight as to how community-based ecological restoration might enhance resilience and transitions toward peace. The chapter relies heavily on empirical research conducted in the complex emergency that arose in New Orleans at the time of Hurricane Katrina, one that

LOCATION	RED ZONE TYPE
Afghanistan	Ongoing wars in the Middle East
Berlin, Germany	Post-Cold War divisions
Charleston, South Carolina	1989 Hurricane Hugo
Cameroon and Chad	Mid 2000's civil unrest in Central Africa
Cyprus	Demarcation between Greek and Turkish Cyprus
Europe	1940's WW II Nazi internment camps
Guatemala	Ongoing post-conflict insecurity
Iraq	Ongoing wars in the Middle East
Johannesburg, South Africa	Early 2000's Soweto, Post-Apartheid violence
Kenya	Early 2000's Resource scarcity conflict
Liberia	1989- 2003 civil war
Madagascar	Costal vulnerability
New Orleans, USA	2005 Hurricane Katrina
New York City, USA	2001 September 11 th terrorist attacks
Rotterdam, Netherlands	Ongoing urban insecurity
Port-au-Prince, Haiti	2010 earthquake
Russia	Post-Soviet Cold War urban insecurity
Sarajevo, Bosnia and Herzegovina	1992-1996 conflict
South Korea	Demilitarized Zone
South Korea	2002 Typhoon and coastal vulnerability
Stockholm, Sweden	Urban insecurity in times of war
Tokyo and Hiroshima, Japan	WW II bombings
United States	WW II involvement
United States	Violence and prison populations

Fig. 3.1 Locations and types of red zones where greening has been documented and linked to ecological restoration that have enhanced resilience and/or transitions toward peace. *Source* The author

included both the typical features of severe weather-related hazards as well as a militarized environment reacting to rumors and realities of violence and unrest, but includes examples from throughout the world as well.

3.3.1 Greening

While recognizing the importance of green political thought¹ and of a growing interest in a 'green economy' (Milani 2000; Pearce et al. 1992), this chapter focuses more specifically on green initiatives that emerge in a context of self-organized community development and community-based natural resources management. In fact, perhaps a significant accomplishment of such grassroots greening practices, in particular the more participatory or activist forms embodied

¹ For an overview of green political thought, see <http://www.greenparty.org/> and [http://www.global.greens.org.au/charter/10values\(us\).html](http://www.global.greens.org.au/charter/10values(us).html)

in many community gardens in New York and other large cities during periods of neighbourhood strife and unrest or after terrorist attacks (Saldivar and Krasny 2004; Schmelzkopf 1995) and in tree planting efforts in neighbourhoods that experienced a period of violence and unrest after Hurricane Katrina struck New Orleans² (Tidball 2013; Tidball et al. 2010), is the steady and growing mainstream acceptance of much of what was once ‘fringe’ green political thought. The philosopher Andrew Light (2003) has captured this notion in his description of how grassroots environmental stewardship efforts in cities are defining a new environmental movement; this civic environmental movement finds its inspiration in the work of urban ‘community greeners’.

For the purposes of this chapter, the political or philosophical dimensions of greening will not be dealt with in much depth or detail. Nor will this chapter delve solely or too deeply into the broad field of horticulture, which concerns itself with growing plants in cities for ornamentation and other purposes (Tukey 1983). Rather than focus strictly on utilization of plants, an emphasis on their active *cultivation* within a social-ecological or community context will prevail, going beyond the ornamental uses of plants and nature to suggest that human relationships with plants, animals, and landscapes have a role to play in urban and other settings faced with civil war, genocide, political instability, and state collapse and representing opportunities for community-based ecological restoration to enhance resilience and transitions toward peace.

Thus, greening is operationalized as *an active and integrated approach to the appreciation, stewardship and management of living elements of social-ecological systems*. Greening takes place in cities, towns, townships and informal settlements in urban and peri-urban areas, and in the battlefields of war and of disaster. Greening sites vary—from small woodlands, public and private urban parks and gardens, urban natural areas, street tree and city square plantings, botanical gardens and cemeteries, to watersheds, whole forests and national or international parks. Greening involves *active participation* with nature and in human or civil society (Tidball and Krasny 2007)—and thus can be distinguished from notions of “nature contact” (Ulrich 1993) that imply spending time in or viewing nature, but not necessarily active stewardship. Thus, this chapter is a continuation of efforts to explore how greening can enable or enhance transitions from conflict in situations where community members actively participate in greening, which in turn results in measurable, peaceful benefits for themselves, their community, and the environment.

The term greening includes other examples of active engagement with nature that are not obviously horticulturally oriented. For example, the beginnings of civic engagement in helping to form and maintain a national park in war-torn Afghanistan (Smallwood 2013), and examples of war veterans initiating hunting

² Illustrating how so-called ‘natural disasters’ can quickly take on characteristics of war zones, as many as 15,000 federal troops, National Guardsmen, and private contractors from Blackwater USA patrolled New Orleans in the wake of Katrina. For an overview of policing in post-Katrina New Orleans, see Deflem and Sutphin (2009) and for an over view of ‘disaster as war’ in post-Katrina New Orleans, see Tierney and Bevc (2007).

and fishing programmes to help their fellow soldiers heal from the scars of war (Krasny et al. 2013), and other examples (Fig. 3.1) all represent efforts that have emerged in response to conflict and disturbance, and that involve greening or other engagement in nature that integrates a community or civic, or in a few cases political, purpose.

3.3.2 Red Zones

The term ‘red zone’ has a history dating back to at least the first part of the Twentieth century. One of its first usages was in reference to the ‘*Zone rouge*’ (French for Red Zone), the name given to 465 square miles of northeastern France that were destroyed during the First World War (Smith and Hill 1920). In more recent times, the term has been used to refer to unsafe areas in Iraq after the 2003 invasion of the US and its allies, the opposite of ‘Green Zone,’ a presumably more safe area in Iraq. The term was also used by journalist Steven Vincent,³ as part of the title of his book *In the Red Zone: A Journey Into the Soul of Iraq* (2004) and has been used by others to describe lawless conditions such as those of the Rwandan genocide.⁴

An internet search for ‘red zone’ illuminates how the term is currently used in film and digital entertainment media to connote a war zone, a hostile zone, a contaminated zone, or a zone characterized by increased intensity and higher stakes, such as in the combative sport American football. The term has also been used to describe the disorientation phase in a second order learning process documented and conceptualized in a learning process model among adults (Taylor 1986). In this chapter, the term *red zone* is used to refer to multiple settings (spatial and temporal) that may be characterized as intense, potentially or recently hostile or dangerous, including those in post-disaster situations caused by geophysical disasters as well as those associated with terrorist attacks and war.

Within these red zones are people for whom the red zone represents a perturbation or disruption of their individual, family, and community patterns of living. For a herder in rural Afghanistan, a soldier occupying the herder’s village, or a relief worker from an NGO, red zones represent both a time period and points on a landscape where linked ecological and social patterns are disturbed suddenly, drastically, and with little warning. These situations are referred to as *Stability, Security, Transition and Reconstruction* (SSTR) contexts by aid, diplomacy, and military organizations. According to the US Department of Defense (2005):

³ Vincent was tragically murdered in Basra, Iraq while reporting on the increasing infiltration of the Basra police force by Islamic extremists loyal to Muqtada al Sadr. See at: http://www.nytimes.com/2005/08/03/international/middleeast/03cnd-iraq.html?_r=1

⁴ <http://www.pbs.org/wgbh/pages/frontline/shows/ghosts/interviews/power.html>

...the immediate goal [in SSTR activities] is to provide the local populace with security, restore essential services, and meet humanitarian needs. The long-term goal is to help develop indigenous capacity for securing essential services, a viable market economy, rule of law, democratic institutions, and a robust civil society. Tasks include helping rebuild indigenous institutions including various types of security forces, correctional facilities, and judicial systems necessary to secure and stabilize the environment; reviving or building the private sector, including encouraging citizen-driven, bottom-up economic activity and constructing necessary infrastructure; and developing representative governmental institutions (pp. 2–3).

This chapter suggests that those involved in SSTR go beyond their usual strategies to consider the question: How might greening play a role alongside other interventions in transforming red zones so that they become more secure, provide essential services, and meet humanitarian needs? Raising this question is, then, a suggestion that providing resources and spaces for individuals and communities to engage in greening will contribute to a community's ability to adapt and transform in the face of violence and unrest and that providing opportunities for expressing this need to be in, and to steward, nature may contribute to stability and order post-conflict. But what mechanistic function or functions of this greening can be credited for such effects?

3.4 Mechanisms of Resilience and Other 'Re-Words': Community-Based Ecological Restoration

Due to a focus on outdoor recreation for returning combatants in the last few years,⁵ a common theme has emerged among soldiers when discussing the value of their activities to their reintegration to peaceful society. This theme is the tripartite notion of recreation, reconnection and renewal. These three 're-words' are common in the discourse of urban ecology and related disciplines. These words, and many like them (see Fig. 3.2), are interesting because of what so many of them represent—they are 'do-over' words, words that indicate another opportunity, a second chance. They suggest alternate endings and outcomes, improved performance or satisfaction, a kind of optimism and hopefulness that a second chance means a better conclusion.

Interest in these re-words stems from the broader philosophical underpinnings of work on the notion of 'greening in the red zone.' Though in a direct sense this work is focused on how humans interact with nature in the midst of and in the aftermath of calamity, and how that interaction is a very important but underappreciated source of resilience and recovery, in a broader sense this work on nature

⁵ This work in progress is funded by USDA Federal Formula Funds, under two projects: (1) 2011–2012–221: *Returning Warriors: A Study of the Social-Ecological Benefits of Coming Home to Nature*; and (2) 2013–2014–380: *Returning Warriors: Outdoor Recreation & Restoration for Resilience*.

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Fig. 3.2 So-called ‘re-words’ often indicate another opportunity, a second chance

and green spaces in areas facing conflict, hazard and vulnerability is about playing a hunch. The hunch is that perhaps a key to this idea we are collectively chasing called *sustainability* is in essence a focused understanding of how our species remembers and reconstitutes relationships with the rest of nature when serious calamity occurs.

What can we learn about how humans relate and reconnect with nature in dire circumstances? And how can that learning about what we do in urgent circumstances be applied to longer term thinking about sustainability and resilience, especially in efforts to expand the notion of peace ecology?

In addressing these broader questions, it seems that this work is mostly about a kind of archaeology of the human social-ecological experience, trying to excavate and peel back the layers of history that have covered over our ecological identity. This is interesting because fundamentally many agree that our species faces very dark days indeed if we cannot remember our ecological identity and recover a peaceful relationship with the ecosystems upon which we depend. Given the challenges facing society and our planet, remembering and recovering our individual and collective ecological identity is of the utmost urgency. However, hopeless this endeavour feels in daily life, it is when we are faced with calamity that our withering ecological identity suddenly flushes and blooms, and becomes more clearly important to our survival.

Documentation and arguments that creation and access to green spaces promotes *individual* human health, especially in therapeutic contexts among those

suffering traumatic events have been presented elsewhere (Tidball and Krasny 2007). But what of the role of access to green space and the act of *creating and caring* for such places in promoting social health and well-being, at neighbourhood, community, and even city-wide scales, especially in SSTR contexts? The greening in the red zone project (Tidball and Krasny 2013a) asserts that creation and access to green spaces confers resilience and recovery in systems, from individual human systems to regional and landscape scale systems, which have been disrupted by violent conflict, crisis, or disaster. Evidence for this assertion are provided through cases and examples, using a variety of research and policy frameworks to explore how creation and access to green spaces in extreme situations might contribute to resistance, recovery, and resilience of social-ecological systems. What remains is to apply this explicitly to the domain of the linked notions of ecology and peace.

Fundamental to the greening in the red zone project is the argument put forward by Berkes and Folke (1998): systems that demonstrate resilience appear to have learned to recognize feedback, and therefore possess “*mechanisms* by which information from the environment can be received, processed, and interpreted” (Berkes and Folke 1998: 21, emphasis added). In this sense, these scholars go further than simply recognizing that people are part of ecological systems, but attempt to explore the means, or social *mechanisms*, that bring about the conditions needed for adaptation in the face of disturbance and other processes fundamental to social-ecological system resilience. One such social mechanism extensively documented by Berkes and colleagues is traditional ecological knowledge (Berkes 2004; Berkes et al. 2000; Berkes and Turner 2006; Davidson-Hunt and Berkes 2003; see also Shava et al. 2010). But what other social mechanisms might exist and how does one identify and describe these mechanisms in often urban post-conflict scenarios?

As a result of the greening in the red zone project, additional questions have arisen that must be addressed:

- What processes or mechanisms might explain the phenomena of greening in the red zone?
- Why do people turn to nature and green spaces as sources, sites, and systems of resilience and other re-words?

To date, the list of processes/mechanisms that might explain the emergence and persistence of greening in the red zone includes five processes:

- (1) Urgent Biophilia
- (2) Restorative Topophilia
- (3) Memorialization Mechanisms
- (4) Social-ecological Symbols and Social-ecological Rituals; and
- (5) Discourses of Defiance.

A brief description of each of these mechanisms appears in the coming paragraphs, followed by a conclusion with some caveats and areas for future work. Each of these has been explored individually and presented elsewhere in a peer

MECHANISM/PROCESS	DESCRIPTION	CITATION
Urgent Biophilia	Relatively dormant or muted innate attractions to the rest of nature flood to the fore in the form of “urges” to “get back to nature” in crisis contexts.	Tidball, KG 2012. Urgent Biophilia: Human-Nature Interactions and Biological Attractions in Disaster Resilience. <i>Ecology and Society</i> , 17(2).
Restorative Topophilia	Heightened awareness of place attachment that manifests itself in restoration and recovery of key elements, symbols, etc. that epitomize the “placeness” of a crisis affected area.	Tidball, KG & RC Stedman. 2013. Positive Dependency and Virtuous Cycles: From Resource Dependence to Resilience in Urban Social-Ecological Systems. <i>Ecological Economics</i> 86, 292-299.
Memorialization Mechanism	When spontaneous and collective memorialization of lost ones through gardening and tree planting occurs, a community of practice emerges to act upon and apply these memories to social learning about greening practices.	Tidball, KG, ME Krasny, E Svendsen, L Campbell, & K Helphand. 2010. Stewardship, Learning, and Memory in Disaster Resilience. “Resilience in Social-Ecological Systems: the Role of Learning and Education.” <i>Environmental Education Research</i> , 16(5): 341-357.
Social-ecological Symbols & Social-ecological Rituals	Presence of tree symbols, the 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.	Tidball, KG (2013). Trees and Rebirth: Social-Ecological Symbols, Rituals and Resilience in Post-Katrina New Orleans. In: Tidball and Krasny, Eds., <i>Greening in the Red Zone: Disaster, Resilience, and Community Greening</i> . NY: Springer.
Discourses of Defiance	Within crisis contexts, when some or all of the above processes are leveraged to become wider movements of resistance, recovery, and resilience, especially in the wake of news media or other information that portrays a group or community in an unfavorable light.	Tidball, KG, Svendsen, E, Campbell, L, Falxa-Raymond, N. (in preparation). Landscapes of Resilience and Discourses of Defiance: Greening as Recovery in Joplin and New York City.

Fig. 3.3 Processes and mechanisms theorized to explain why people turn to greening in crisis. *Source* The author

reviewed journal article or book chapter (see Fig. 3.3), so in this chapter will only be briefly described. The reader interested in more detail is encouraged to locate the sources in Fig. 3.3.

3.5 Urgent Biophilia

Perhaps the foundational mechanism, *urgent biophilia* (Tidball 2012b) is the affinity we humans have for the rest of nature, the process of remembering that attraction, and the urge to express it through creation of restorative environments, which may also restore or increase ecological function, and may confer resilience across multiple scales. So, when faced with violence as in prolonged conflict or war, as individuals and as communities and populations, we seek engagement with nature to summon and demonstrate resilience in the face of a crisis, we are demonstrating an urgent biophilia.

Urgent biophilia represents an important set of human-nature interactions in SES recently perturbed by violence, conflict, and war, often appearing in the ‘backloop’ of the adaptive cycle (Holling and Gunderson 2002; see Fig. 3.4).

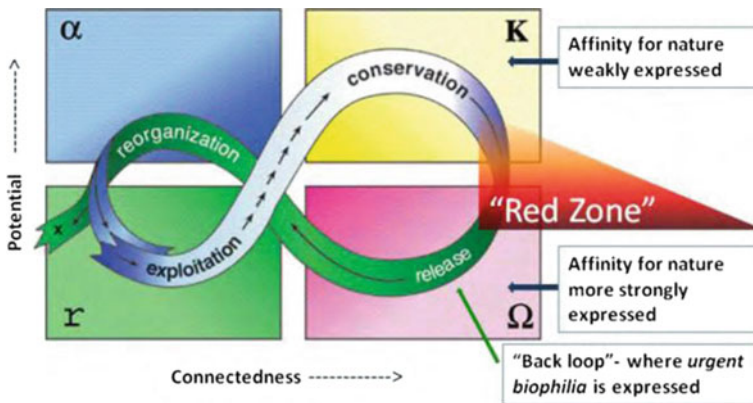


Fig. 3.4 The adaptive cycle, meant to be a tool for thought, focuses attention upon processes of destruction and reorganization, which are often neglected in favor of growth and conservation. In this adaptation, urgent biophilia is modeled. For more on the adaptive cycle, see the Resilience Alliance website; at: <http://www.resiliencealliance.com/>

Urgent biophilia builds upon contemporary work on principles of biological attraction (Agnati et al. 2009a; b) as well as earlier work on biophilia (Kellert 1997a, b; Kellert and Wilson 1993; Wilson 1984, 1993) while synthesizing literatures on restorative environments, community-based ecological restoration, and both community and social-ecological disaster resilience.

3.6 Restorative Topophilia

This mechanism is yin to the yang of urgent biophilia. Here, drawing upon Tuan's notion of topophilia (literally 'love of place'), the emphasis is on a social actor's attachment to place and the symbolic meanings that underlie this attachment. In contrast to urgent biophilia, *restorative topophilia* (Stedman and Ingalls 2013; Tidball 2012a; Tidball and Stedman 2013) is conceived and operationalized as more experiential and 'constructed' rather than innate, and suggests that topophilia serves as a powerful base for individual and collective actions that repair and/or enhance valued attributes of place. These restorative greening actions are based not only on attachment—people fight for the places they care about—but also on meanings, which define the kinds of places people are fighting for.

An important implication of the juxtaposition of urgent biophilia and restorative topophilia is the conceptualization of positive dependency. This idea suggests that purely-deficit based perspectives regarding conflict-ridden social-ecological systems and the human populations within them represent barriers to these systems' ability to move from undesirable system states into more desirable, sustainable ones. A characterization of issues such as individual ecological identity, human

exceptionalism and exemptionalism (Cairns 1999), anthropocentrism, and resource dependence is offered, in order to better examine notions found in the resource dependency literature, such as the roots of ideas about dependency. This literature is used as a springboard into the possibilities of an antipodal notion of resource dependency that may be applicable in SSTR contexts, named positive dependency.

Positive dependency as a concept allows us to escape the misguided conclusions potentially drawn by resource dependence arguments that the more that humans depend on natural resources, especially for tangible needs, the more those humans become vulnerable, the more their resilience is compromised. While attempting to recover or reconcile our relationship with nature, society may not need the contradictory message that “the less we are forced to depend upon nature, the better off we are” rattling around our heads. Rather, we can benefit by contributing to the evolution of resource dependency thinking to include the at once simple yet profound idea that “the more we acknowledge our dependence on nature, especially in urban contexts, the more resilient we can be”. Two possible sources of positive dependency in conflict-laden social-ecological systems are suggested, the aforementioned urgent biophilia and restorative topophilia. An important conclusion is the recognition of positive dependency as a precursor to the development of a heightened sense of ecological self and sense of ecological place in social-ecological systems perturbed by violence and war. However, contested meanings over symbols of place, and contested territories themselves, can complicate and even frustrate positive dependency, as is seen in the territorial disputes between Israelis and Palestinians (Fig. 3.5).



Fig. 3.5 Three examples of trees representing social-ecological symbols that can be deployed for expression of urgent biophilia, restorative topophilia, and memorialization **a** live oak trees like these in New Orleans were destroyed by Hurricane Katrina and replanted afterwards as a way to express a need to reconnect with nature; **b** Israel’s West Bank along the Dead Sea, palms have multiple contested meanings and can be planted or destroyed in efforts to recreate or redefine place meanings, and **c** Hiroshima, Japan, trees that survived the A-bomb are used to memorialize lost human lives and to serve as symbols for a peaceful future. *Source* Photos by Keith G. Tidball

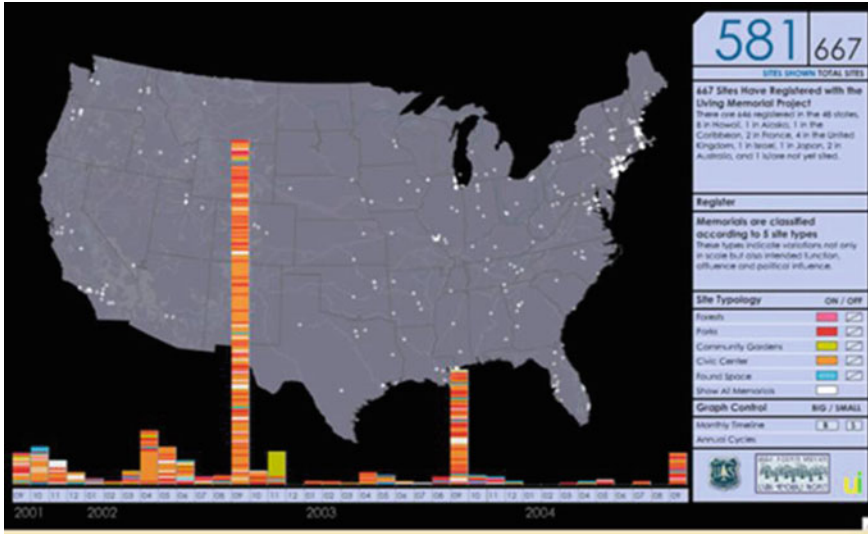


Fig. 3.6 The USDA Forest Service project Living Memorials illustrates the power of the memorialization mechanism. This map depicts Living Memorial sites memorializing the terrorist attacks of 9/11 across the U.S. *Source* Image courtesy of US Forest Service Living Memorials Project

3.7 Memorialization Mechanisms

A greening *memorialization mechanism* (Tidball et al. 2010) begins right after a crisis, when spontaneous and collective memorialization of lost family members or community members through gardening, tree planting, or other civic ecology (Krasny/Tidball 2012; Tidball and Krasny 2007) 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 between remembering, learning, and enhancing individual, social, and environmental well-being (Fig. 3.6).

3.8 Social-Ecological Symbols and Social-Ecological Rituals

Social-ecological 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/International African Institute 1968: 2; Deflem 1991). Returning to the example of post-Katrina New Orleans,

reforestation activities emerged as rituals by which information that represented a counter-narrative to news media and others who spoke of New Orleans' episodes of unrest after the hurricane as a 'city gone feral,' a 'failure of resilience,' a 'snakepit of lawlessness and anarchy' (see Tierney et al. 2006) was revealed and regarded as authoritative (Tidball 2013). Post-Katrina 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.

But tree planting rituals and the social–ecological symbols contained in them reveal more than crucial social values. They are also transformative for human attitudes and behaviour, 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. Whereas New Orleans residents, in efforts to resist being labeled a 'feral city' (Norton 2003), may have been attracted to tree symbols and rituals' as a result of the operation of urgent biophilia, restorative topophilia, positive dependency, biological impulses combined with socio-cultural phenomena, for instance, recalling social-ecological memories (Barthel et al. 2010), involvement in memorialization mechanisms, or the clear connection of trees to notions of stability and re-birth, research in New Orleans suggests that subsequent participation in tree planting rituals appeared to change the persons involved such

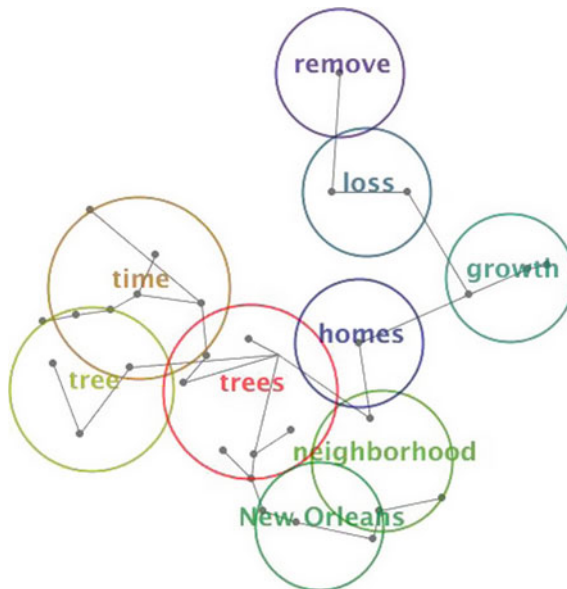


Fig. 3.7 Graphic depiction of concepts, themes, connectivity, and relevance from research in New Orleans from 2006 to 2012. Note the closeness of concepts of trees and tree with New Orleans, homes, and neighbourhood, indicating strong symbolic significance in trees and ideas of place. *Source* The author

that they experienced renewed hope, optimism, and sense of commitment to their neighbourhood and to their city, important indicators of community resilience (Tidball 2012a) (Fig. 3.7).

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. This contributed to enhancing a sense of joint enterprise and identity, and therefore contributed to the resilience of the New Orleans social-ecological system. New Orleans 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. 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. Trees as symbols are especially common in red zone areas throughout the world (Fig. 3.8).

3.9 Discourses of Defiance

As discussed in the above section describing the importance of tree symbols and tree rituals as counter-narratives, the *discourses of defiance* mechanism is focused specifically on the importance of the use of social-ecological symbols and rituals, memorialization, restorative tophilia, and urgent biophilia to resist or reshape the conversation about where one resides and the people living there. This mechanism was first explored in research conducted in New Orleans, as residents resisted initial discourses promulgated by the news media essentially ‘writing off’ New Orleans as a failed, or worse, feral city. Residents used many of the mechanisms above to reframe the discourse to reflect a more hopeful, more optimistic, recovery and rebirth oriented conversation.

But like most of the mechanisms described, there is a potential dark side to discourses of defiance. 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 (Cronon 2003; Fairhead and Leach 1996; Guha 1989; Prudham 2004; Scott 1998). For the purposes of this chapter, perhaps a most salient example exists in the Israel/Palestine territorial conflict. Here, 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). Braverman describes in great depth 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

Symbol Family/Type	Gen. Category of Symbolic Meaning	Value	Occurrence
Trees	survival, stability, strength, longevity	Positive (P)	27
	sense of place icons	P	22
	hope, commitment, future	P	16
	life & growth	P	11
	memorials	P	6
	sign of return to normalcy	P	5
	therapy	P	4
	rescuer or refuge	P	2
	visual communication	P	n/a
	removal =punishment/penalty/taking	Negative (N)	16
Tree planting	damaged =injury/wound/brokenness	N	11
	fallen down = damage/tragedy/loss	N	5
	falling = fear/terror danger/death	N	3
	public service	P	18
Trees & tree planting	commitment to future	P	15
	means of beautifying	P	13
	improving environment	P	14
Trees & tree planting	positive impact on landscape	P	8
	educational	P	6
	Liability, risk, hazard, gentrification	N	5

Fig. 3.8 Multiple symbolic meanings of trees in different contexts derived from interview data in post-Katrina New Orleans. The chart depicts three broad families of symbolic meanings of trees: (A) trees themselves as symbols (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. 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 mechanism within the greening in the red zone system, and a source of resilience in this kind of urban social-ecological system undergoing rapid change. *Source* The author

military forces, removed, and destroyed, in some cases repeatedly. In cases such as this, the discourses of defiance as mechanisms may in fact contribute to conflict rather than serve as sources of resilience and peaceful transitions.

3.10 Conclusion

A growing network of social and ecological scientists argue that change is to be expected and planned for, and that identifying sources and mechanisms of resilience in the face of change is crucial to the long-term well-being of humans, their communities, and the local environment (Elmqvist et al. 2013). Yet, as has been pointed out elsewhere, several gaps in the resilience literature persist, including (1) a lack of studies focused on cultural systems (Wright/and Masten 2005), (2) relatively few studies that explicitly re-embed humans in ecosystems, and (3) a need for more studies that integrate the theory and science of individual human resilience with broader ecological systems theory and research exemplified by social-ecological systems resilience scholarship (Masten/Obradovic 2008). In introducing the reader to the five mechanisms above, this chapter has outlined an attempt to address these gaps, and to further efforts to utilize community-based ecological restoration to enhance resilience and transitions toward peace, by asking two fundamental questions.

The questions raised were: What processes or *mechanisms* might explain the phenomena of greening in the red zone? How might community-based ecological restoration enhance resilience and transitions toward peace? These questions allude to application in planning and policy making fields, in natural resource management, and in fields dealing with Stability, Security, Transition and Reconstruction. Both questions belie a desire to conceptualize human systems as nested within ecological systems, and therefore human resilience as nested within ecological resilience, especially at the nexus of peace, ecology, and resilience. The first efforts at answers to these questions seem to be timely given continuing worries about conflict over access to resources, climate change, and overpopulation and the red zones that will inevitably emerge. The ways in which we as humans reorganize, learn, recover and demonstrate resilience through remembering and operationalizing the value of our relationships with elements of our shared ecologies in the direst of circumstances such as disaster and war hold clues to how we might increase human resilience to new surprises, while contributing sources of social-ecological resilience to ecosystems. This would seem to be an important future direction for ecology and peace research. In conclusion, and returning to the questions raised by Weinthal (2004) earlier, this chapter argues that, firstly, indeed, there *are* other environmental resources also positioned to foster peace, and that these can be found in the many greening activities engaged in by the rank and file residents resolutely attempting to return their lives to 'normal' in the wake of calamity. Trees, gardens, parks, landscapes, and the creatures moving about within them are important, but so often overlooked, environmental resources that point to sources and mechanisms of resilience.

Secondly, Weinthal's (2004) suggestion of a focus on lower levels of analysis is a wise one. Not only were most of the security threats that emerged in the 1990s intrastate threats, the first and a good portion of the second decades of the 2000s have been characterized by security threats of an asymmetrical nature and lacking

a defined front or forward edge of the battle area. Could we, as Weinthal asks, use the environment as a peacemaking tool within states and along tenuous border regions? Again, this chapter suggests that, given the overlooked and largely untapped social-ecological resources available as repositories of resilience and mechanisms that bring about the conditions needed for adaptation in the face of disturbance, not just the environment as a setting, but *engagement with the environment* shows great promise as a peacemaking tool in intrastate contexts and in territorial disputes.

Finally, this chapter's suggestion that community-based ecological restoration might enhance resilience and transitions toward peace seems to give great support to Weinthal's (2004) observation that the environment might be thought of as more than solely a mechanism to mitigate hostilities and therefore bring about peace. It might also offer opportunities in post conflict resolution to *sustain* a fragile peace and prevent a return to violence. The many examples offered of greening in the red zone, and the specific processes and mechanisms that might explain the emergence and persistence of greening in the red zone described herein, would appear to assist in bringing into focus a future trajectory for peace ecology, that being to encourage and convince (via empirical research and sound theory) researchers, policymakers, and practitioners to move beyond simply conflict scenarios and environmental peacemaking towards Weinthal's notion of environmental peacekeeping.

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