



# USING RESILIENCE CONCEPTS TO INVESTIGATE THE IMPACTS OF PROTECTED AREA TOURISM ON COMMUNITIES

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**Abstract:** Protected area tourism is a growing trend worldwide. It has an enormous potential to impact on local communities. Traditional assessment methods tend to focus on current conditions using sustainability indicators that are often poorly chosen resulting in the misidentification and misinterpretation of impacts. Research in systems thinking and resilience suggest that future conditions may be different, more extreme and rapidly changing than previously experienced, requiring very different approaches to assessment. New methods acknowledging uncertainty and change are required. Here we present a novel approach to investigating the impacts of protected area tourism on communities by framing them as a social-ecological system and adopting resilience assessment principles. **Keywords:** community, impacts, protected area tourism, resilience, thresholds, uncertainty. © 2009 Elsevier Ltd. All rights reserved.

## INTRODUCTION

The power of nature and natural settings in attracting tourists is widely recognized, with protected areas offering a significant attraction to tourists (Pedersen, 2002; Reinius & Fredman, 2007). Increasingly, tourism is one of the most common uses of protected areas (Walpole & Goodwin, 2001). Protected areas are defined as areas of “land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means” (IUCN, 1994, p. 7). Very often, protected areas and tourism are intertwined and their respective impacts on local communities are difficult to separate. The sustainability of protected areas is accepted as dependent on

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due attendance to their social, economic and cultural context (Fortin & Gagnon, 1999; McCleave, Booth, & Espiner, 2004).

However, conflicts between protected areas and communities can adversely affect this sustainability. Plummer and Fennell (2009) propose that multi-stakeholder conflict, complexity and uncertainty are issues that remain unresolved and persistent. When problems persist and are not resolved by current interventions they may be classed as “messy” or “wicked” (Allen & Gould, 1986; Rittel & Webber, 1973) and require a new paradigm to understand them. Before exploring a new paradigm or way of thinking about and investigating the relationships (and associated impacts) between protected areas, tourism and local communities, it is useful if not essential to review current methods using a “whole system” perspective.

This whole system perspective is being actively pursued in current research on tourism as a complex adaptive system (Farrell & Twining-Ward, 2005; Lacitignola, Petrosillo, Cataldi, & Zurlini, 2007). Such systems, where the social components are explicitly acknowledged (as is the case with tourism), are known as social-ecological systems (SES) (Allison & Hobbs, 2006; Gunderson & Holling, 2002; Schianetz & Kavanagh, 2008; Walker & Salt, 2006). Many interacting variables are characteristic of SES, with the systems behaving according to three principles: order is emergent as opposed to predetermined; the system’s history is irreversible; and the system’s future is unpredictable (Waldrop, 1992).

Systems thinking is required to bridge the social and biophysical sciences (Allison & Hobbs, 2004) to help understand, for example, how to link social and ecological systems for sustainability (Berkes & Folke, 1998). Fennell (2004) and Dredge (2006) highlight that issues associated with tourism and protected areas are inherently complex, multi-scaled (local, regional, national and global) and involve horizontal as well as vertical linkages. For example, communities, whether local or further afield, are an integral part of the protected area tourism system. Management of sustainable tourism relating to protected areas should anticipate system dynamism and transformative changes (Plummer & Fennell, 2009).

### *Components of a Protected Area Tourism System*

Protected area tourism systems are generally comprised of three key components: a given protected area, tourism operations and associated communities. Protected areas themselves take several forms. According to official IUCN designation, there are six types of protected areas: strict nature reserves or wilderness areas; national parks; natural monuments; habitat or species management areas; protected land or seascapes; and managed resource protection areas (IUCN, 1994). The primary management objectives of these protected areas differ considerably (Eagles, McCool, & Haynes, 2002).

The management authority for a given protected area varies according to the differing management objectives (Eagles, 2009).

Traditionally, the state or government is the management authority. This role is diversifying, however, and partnerships are gaining prominence (Moore & Weiler, 2009). Increasingly, the management authority is vested in alternative arrangements involving a range of actors. Prominent arrangements include parastatal models, non-profit corporations such as non-governmental organisations, public or private for-profit corporations and communities themselves. Co-management arrangements, where decision-making power is shared between two or more bodies, one of whom is government, is another emerging approach (Eagles, 2009).

Protected area tourism systems also comprise a tourism component. Protected area tourism differs from other kinds of tourism in that it occurs in natural settings. It fits within the broader undertaking of 'natural area tourism', which provides an alternative to traditional mass tourism. Natural area tourism includes adventure, nature-based, wildlife and ecotourism (Newsome, Moore, & Dowling, 2002). This paper adopts an inclusive definition of 'protected area tourism' to incorporate all tourism activities that occur within protected areas.

Local communities form the final key component of protected area tourism systems. Local communities include residents living within or in close proximity to a protected area. Geographical location is an important defining context in determining 'local community' (Burns & Sofield, 2001). The protected area and associated tourism impacts on local communities both directly and indirectly through its existence and capacity to attract tourists.

Geographical location does not imply uniformity in local attitudes or functional relationship to protected area tourism. Attitudes, involvement and dependencies of locals on protected areas (Eagles & McCool, 2002) and tourism are diverse and context-dependent (Burns & Sofield, 2001; Mvula, 2001). Relevant factors affecting local attitudes and relations to tourism include length of residence; employment; degree of economic dependence; socio-cultural and economic distance between tourists and the community; and distance of community from the tourism area (Deery, Jago, & Fredline, 2005). Direct economic dependence on tourism has been shown to be the single most important factor affecting perceptions (Andereck, Valentine, Knopf, & Vogt, 2005).

The choice of a geographically defined 'local community' is supported by the spatially restricted nature of protected area tourism and the assumption that geographically adjacent communities will experience the greatest impacts arising from that area. The tourism literature also reveals a predilection for a geographical perspective of community (Beeton, 2006b) although this should be treated with caution as the boundary is necessarily porous to allow for a range of social, economic and political factors that may impact from scales above and below (Novelli & Scarth, 2007). The involvement of local people in analyzing and understanding protected area tourism has been noted as crucial as these people are most likely to be affected by policy development (Plummer & Fennell, 2009). While acknowledging the highly contested nature of 'community' (Blackstock, 2005; Fabricius, 2004),

for simplicity this paper adopts the perspective of geographical or local communities.

Importantly, local community comprises just one element of those interested or affected by protected area tourism. A wide-range of potential stakeholders associated with protected areas exist and are also essential parts of the protected area tourism system. Local community represents one key group of stakeholders. Others include those directly affected such as visitors themselves, Park management and tourism authorities, plus those further afield (Newsome et al., 2002). These other stakeholders represent ‘communities of interest’, which are typified by shared interests rather than a defined spatial location (Beeton, 2006a).

This paper provides a novel approach to investigating the impacts of protected area tourism on local communities. The approach draws on the resilience assessment guidelines as outlined by The Resilience Alliance (2007a, 2007b), a multidisciplinary, global network of scholars and practitioners interested in understanding the dynamics of complex SES. The Resilience Alliance guidelines ([www.resalliance.org](http://www.resalliance.org)) provide a general protocol for applying resilience perspectives (Francis, 2008) to SES. These guidelines, supplemented by developments arising from the Stockholm Resilience Centre, were modified for application to protected area tourism.

Resilience thinking provides a way of understanding human and natural systems as complex systems that are continually adapting (Allison & Hobbs, 2004; Walker & Salt, 2006). The resilience guidelines are underpinned by an acknowledgement of the complexity, uncertainty and dynamism that characterize SES (Allison & Hobbs, 2006; Resilience Alliance, 2007b). The description of this approach is necessarily preceded by a review of existing methods and explanatory detail on systems and resilience thinking. The paper concludes with comments on the benefits of this novel approach through its explicit recognition of system change, complexity and uncertainty. The difficulties in determining the system boundaries are also addressed.

## EXISTING METHODS FOR DETERMINING THE IMPACTS OF PROTECTED AREA TOURISM

In many areas tourism is seen as an answer to economic development, particularly areas of natural beauty such as the Great Barrier Reef, Australia and spectacular wildlife such as Imfolozi Wilderness Area, South Africa. However, increasing numbers of people bring with them a range of socio-cultural and environmental problems. Currently, the selection of indicators in the context of tourism assessment is directly related to the identification of the most important issues or impacts from the perspective of stakeholders (Miller & Twining-Ward, 2005) or on the assessment of experts (Bossel, 2001). This can lead to a thematic approach directed by each sector making an assessment specific to their area of interest, for example, socio-cultural or environmental.

There is a substantial literature regarding methods for measuring socio-cultural impacts (Archer, Cooper, & Ruhanen, 2005). In the tourism field, impacts are commonly measured quantitatively using a Likert scale to investigate residents' perception of impacts and attitudes to tourism (Deery et al., 2005). Qualitative perceptual research, involving community attitudes and self-evaluation of impacts along with the setting of benchmarks and indicators, is another common impact assessment method.

A number of indicator-based frameworks have been proposed to conceptualize, predict and manage visitor impact on the environment. Those applied to visitor use of protected areas include the Limits of Acceptable Change, Visitor Impact Management, Visitor Activity Management Process, Recreational Opportunity Spectrum and the Visitor Impact Management Model (Newsome et al., 2002). These frameworks focus on the current state of a system without considering complex interactions and interdependencies between resources and stakeholders (Sirakaya, Teye, & Sonmez, 2002). The nature of the indicators associated with these frameworks makes management of protected area tourism, when viewed as a complex adaptive system, particularly problematic as both social and ecological systems continue to change over time.

Assumptions of reductionism and sector bias inherent in many existing indicator-based frameworks do not fit with new ideas embracing complexity and uncertainty (Miller & Twining-Ward, 2005; Plummer & Armitage, 2007). Therefore, indicators developed for current system conditions will likely not be applicable when system conditions change (Carpenter, Walker, Anderies, & Abel, 2001). Recognition of changing conditions and uncertainty has given further impetus to the need for new assessment methodologies. Farrell and Twining-Ward (2004) argue the need for greater integration of systems thinking in tourism planning frameworks.

Commonly, tourism researchers imply that the surroundings within which tourism is positioned exist as a separate entity (Farrell & Twining-Ward, 2005; Russell & Faulkner, 1999). This is largely confined to mathematical and economic outlooks where interactions with other systems are not considered or made explicit (Lacitignola et al., 2007) and social and cultural concerns are marginalized (Hampton, 2005). Consequently, emerging thinking conceptualizes tourism as a complex adaptive system, consisting of multiple interacting components (Farrell & Twining-Ward, 2005; Lacitignola et al., 2007; Russell & Faulkner, 1999) in line with the emerging resilience approach.

Residents' attitudes in relation to tourism are often unpredictable or contrary to researcher expectations (Lepp, 2008). Explanation of this may lie in complex systems theory, which suggests unpredictability is to be expected owing to multiple, complex factors interacting in ways that are often historically pre-determined. Such is the case with residents' attitudes to tourism. Therefore, any tourism study conducted without explicit recognition of interacting variables e.g., political, social, cultural, historic, ecological and legal, will reveal an incomplete and possibly confusing picture, as the complex interactions between

system components will not be apparent (Farrell & Twining-Ward, 2005).

## NEW DIRECTIONS FOR ASSESSING PROTECTED AREA TOURISM

These identified shortcomings in existing indicator-based frameworks and the potential benefits of recognizing tourism as a complex adaptive system are further echoed by Farrell and Twining-Ward (2004) who highlighted the potential applicability of systems thinking to tourism research, while noting such applications are largely untested. More recently, the value of systems thinking, specifically for research in protected area tourism, has been emphasized because of its value in aligning the aims of sustainability and fostering system resilience to withstand disturbance and cope with uncertainty (Plummer & Fennell, 2009). This approach differs to optimizing selected system components under current linear processes (Schianetz & Kavanagh, 2008).

System thinking also provides the opportunity to consider and include uncertainty in managing protected area tourism. Uncertainty is a 'situation in which there is not a unique and complete understanding of the system to be managed' (Brugnach, Dewulf, Pahl-Wostl, & Taillieu, 2008, p. 4). Farrell and Twining-Ward (2004) note that current approaches to tourism research are incomplete as they cannot adequately deal with unexpected processes and events. There is ample evidence from case studies on the interactions of people and nature where current theories are capable of explaining system behaviour in times of stability (Allison & Hobbs, 2004, 2006; Gunderson & Holling, 2002). However, in times of crisis and ensuing uncertainty these theories are unable to deal with periods of sudden change (Allison & Hobbs, 2004, 2006). At best they replace inherent uncertainty with the veiled certainty of disciplinary knowledge and precise numbers. At worst the theories ignore the possibility that slowly changing variables (ecological or social) can suddenly cause a rapid change and flip a system into a functionally different state that may be effectively irreversible (Allison & Hobbs, 2006).

Uncertainty is now a given, as evidenced by current global conditions including widespread economic recession and concerns over climate change, both of which impact directly on tourism (Bramwell & Lane, 2009). Quick (2008) concurs, mentioning a number of major uncertainties currently prevalent in the popular media, such as oil supply/prices and increases in extreme weather conditions. As an unpredictable and interconnected system, tourism is vulnerable to outside disturbances (Mill & Morrison, 2006; Russell & Faulkner, 1999) such as the current global economic recession (UN World Tourism Organization, 2009), acts of terrorism (such as the 2002 Bali bombings, 2005 London bombing or September 11) and climate change (UN World Tourism Organization, 2003). Novelli and Scarth (2007) elaborate, citing instability in visitor numbers, exchange rates, political volatility, natural disasters and weather as further disturbances to which a protected area tourism system may be susceptible.

Rather than view the system as in equilibrium we now conceptualize many systems, including tourism, as being far from equilibrium where small changes in one factor may cause the system to cross a threshold or tipping point (Gladwell, 2002). These changes may be abrupt, unexpected and cause surprise. Resilience thinking provides a way to understand such changes. As well as embracing complex changing systems that include both human and natural parts (Walker & Salt, 2006), this thinking also acknowledges the importance of multiple, cross-scale interactions (Berkes, Colding, & Folke, 2003). The characteristics of these complex systems include: multiple, interacting components; cause and effect relationships are often non-linear and unclear; system dynamism; ‘butterfly effects’ (being disproportionately affected by external events); and vulnerability to multiple shocks (Allison & Hobbs, 2006; Lacitygnola et al., 2007; Walker & Salt, 2006).

Resilience itself confers a measure of the capacity of a system to absorb disturbance and reorganize, while undergoing change, with the same or similar system retained (Folke, 2006). Given the focus on local community, examples from social resilience are used throughout this paper. Social resilience relates to the ability of communities to cope with external stress or disturbances resulting from social, political and environmental change (Adger, 2000). The capacity for renewal, reorganization and development are important (Folke, 2006). Carpenter et al. (2001) ascribe three properties to help define resilience: the amount of change a system can experience and remain in the same state; the degree to which a system is capable of self-organization; and the degree to which a system can build capacity to learn/adapt. The following features of the broader resilience perspective are of direct relevance to assessing the impacts of protected area tourism on local communities: change is normal and to be expected; cause and effect are often non-linear and unclear; systems move adaptively through different developmental stages; thresholds accompany most variables and demarcate between different system states; and multiple, interacting scales are the norm (Folke, 2006; Gunderson, 2000).

Adaptability is needed to cope with disturbances. Resilience affords a system the capability to adapt (Folke, 2006), enabling a buffer effect by which the system can better absorb or withstand disturbances (Adger, 2000), as exemplified by current global uncertainties. Adaptability is determined by the absolute and relative amounts of capital: social, financial, human, natural, physical and technological, as well as by systems of governance and institutions (Walker et al., 2006). SES with lower levels of institutional and social capacity to adapt and shape change will be less resilient as they lack alternative options to pursue when facing disturbance (Lacitygnola et al., 2007).

Adaptability of a protected area tourism system is related to drivers. Elucidating drivers, those factors causing change either directly or indirectly in a system, is crucial to assessments of resilience (Walker et al., 2006). Drivers can move a system closer to a threshold (Allison & Hobbs, 2006; Walker & Meyers, 2004). Thresholds are the critical levels separating different patterns of operation and functioning for the protected area tourism system. Both conceptual thinking and

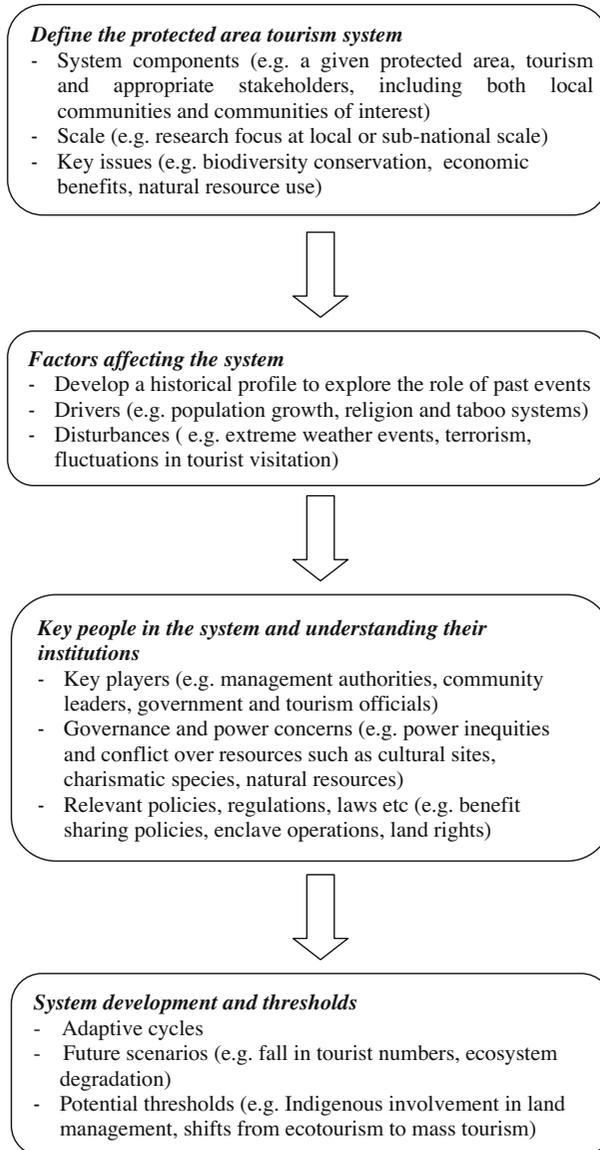
empirical evidence intimate the likelihood of severe negative consequences consequent to a threshold being crossed (Lyytimäki & Hilden, 2007). Examples of SES crossing thresholds are evidenced by loss of biodiversity, degradation of ecosystem services, loss of socio-cultural identity/heritage or change in economic basis (Petrosillo, Zurlini, Grato, & Zaccarelli, 2006). An example of a threshold being irreversibly crossed is that of species extinction (Lyytimäki & Hilden, 2007).

Resilience thinking is particularly useful in understanding protected area tourism. Such tourism embodies a number of challenges that set it apart from tourism elsewhere. Most importantly, protected area tourism occurs within an environment characterized by complexity, change and uncertainty. Inherently “messy” situations result (McCool, 2009; Plummer & Fennell, 2009). Several factors contribute to this “messiness” and complexity. The first of these concerns the dual mandate of many protected areas, charged with delivering both biodiversity conservation and tourism (Eagles et al., 2002). Sustainable tourism in protected areas involves similar trade-offs. Second, protected areas have many different forms of governance (Eagles, 2009; Lockwood, *in press*) and a high level of state influence, resulting in diverse and often unpredictable institutional arrangements. Third, the existence of resource or economically-dependent communities associated with protected areas (Eagles et al., 2002) adds another layer of complexity.

#### APPLYING RESILIENCE THINKING TO INVESTIGATE PROTECTED AREA TOURISM SYSTEMS

Given the preceding rationale, protected area tourism as a SES clearly requires new assessment methods to account for its inherent dynamism and uncertainty. Non-linear approaches are called for, drawing on new ways of thinking such as resilience, adaptive management, systems modeling and scenario planning, integrated with social science and ecology (Farrell & Twining-Ward, 2005). The conceptual framework in Figure 1 provides an alternative to existing linear impact assessment methods by explicitly considering complex interactions and interdependencies between system components as well as investigating the causes and rates of system change. The framework draws on process-orientated approaches from resilience and systems thinking, building progressively on stakeholder perceptions in order to develop an overall picture of conditions, impacts, system interactions and rates of change, potential thresholds and possible future scenarios.

This framework, based on the resilience assessment guidelines of The Resilience Alliance (2007a, 2007b) explicitly considers interactions between system components across multiple scales using multiple worldviews. The Resilience Alliance framework is consistent with the principles of the general system dynamics process and resilience assessment process adopted by Allison and Hobbs (2006). Although the framework components themselves are not new, using it to develop an assessment tool for protected area tourism systems represents a novel transdisciplinary approach. Increasingly advocated in the literature,



**Figure 1. Conceptual Framework: Using the Resilience Assessment Process to Investigate the Impacts of Protected Area Tourism on Community (After The Resilience Alliance, 2007a,b)**

such an approach is appropriate for times of increasing uncertainty and change. This framework also draws on work by Walker, Abel, Anderies, and Ryan (2009), Carpenter et al. (2001) and Walker et al. (2002). Parallels also exist in research regarding adaptive co-management and governance (e.g., Berkes, 2007; Carlsson & Berkes, 2005;

Kofinas, 2009; Plummer & Fennell, 2009). The novelty of this approach lies in the use of Resilience Alliance methodology, which can only be tested via application. To date, only five case studies based upon Resilience Alliance guidelines have been published (see [http://wiki.resalliance.org/index.php/Case\\_studies](http://wiki.resalliance.org/index.php/Case_studies) and Walker et al., 2009), none of which relate to protected area tourism.

The framework presented here is designed to be progressed through iterative participatory processes with local communities, who provide a focus and point of contact (i.e., unit of analysis) for investigating the wider protected area tourism system. Several other provisos also apply, first, only the initial assessment stages of *The Resilience Alliance guidelines* (2007a,b) are used in the paper, for the sake of brevity and focus. A full application of the principles contained in the guidelines would be recommended in practice. This would progress research beyond definition and understanding of protected area tourism systems to include more detailed assessments of resilience. Second, case studies are an important next step to verify the practical utility of the framework outlined here. Third, although the focus here is on local communities, other stakeholders are also critical to understanding the system, including protected area managers, scientists and the tourism industry plus others. Determining stakeholder saliency is aided by attention to property/use rights, the institutional frameworks in which system use is regulated, and decision-making hierarchies (Walker et al., 2002).

Four phases are explored in *Figure 1* and encompass: (1) system definition; (2) factors affecting the system; (3) Key people in the system and understanding their institutions; and (4) system development and thresholds.

### *Phase 1. Define the Protected Area Tourism System*

The protected area tourism system must be defined. This involves investigating the key issues and system boundaries (Cumming et al., 2005) as perceived by the community. Owing to the fragmented and complex nature of communities, the distorting effect of inherent power inequities is perhaps best dealt with by the approach taken by Kayat (2002), who advocates engaging both ‘power’ (those with access to resources by which greater tourism benefits can be gained) and ‘no power’ respondents in order to gain balanced views. Such an approach will aid in overcoming issues associated with the overt or implicit marginalization or elevation of certain groups and individuals within the framework. Berkes (2007) and Plummer and Fennell (2009) (who build upon Berkes, 2007) similarly propose clarification of system participants and power relations in their adaptive co-management assessment frameworks.

Current system conditions are ascertained initially, with impacts then defined in relation to these conditions. The identification of key issues (what is it about protected area tourism that the community want to maintain or are concerned about) point to the main impacts being

experienced. Key issues with respect to the impacts of protected area tourism, from a community perspective, may include but are not limited to economic benefits, crowding, aesthetics, litter, access and resource usage restrictions, employment, decision-making powers, communication with protected area staff, tourist presence and biodiversity conservation. It is important to note, however, that issues important to a community may not be those that are crucial to how the protected area tourism system functions. For example, issues related to less obvious components which provide social benefits, such as species conservation or carbon absorption, are commonly unrecognized, at least initially (Resilience Alliance, 2007b) when viewed through a local community lens.

Identification and demarcation of system scale—how far the boundaries of the protected area tourism system extend for research purposes—is in large part likely to be pre-determined owing to values and research objectives and which conceptualization of ‘community’ is adopted. It is crucial to explicitly note assumptions and reasons for the choice of study scale. For example, a focus on geographical community over a community of interest in relation to protected area tourism must be justified. The authors contend that geographical conceptualizations will, with regards to this framework, provide a sense of centrality or ‘boundedness’ that will aid in defining system boundaries and further, that the negative impacts of protected area tourism are likely to be highly localized to nearby communities.

System definition is further explored through the determination of community perceptions of interactions between themselves, the protected area and tourism in terms of power relations, interrelationships, social values and benefits, impacts and influence. Perspectives relating to conflicts, issues and challenges currently facing the community as a result of protected area tourism and those predicted to occur in the future are investigated. Constructing conceptual maps, be they oral or physical drawings, can provide clues as to cross-scale interactions and system boundaries perceived by the community in question.

### *Phase 2. What Affects the System?*

The second phase of the framework focuses on historical and contemporary factors affecting the protected area tourism system. This second phase provides greater understanding of the drivers causing change in components and interactions of the protected area tourism system as well as influences on these drivers. An historical profile, through which significant causal factors and events underlying the current conditions and impacts can be identified, allows exploration of historical contingency (Allison & Hobbs, 2006; Berkes, 2007; Walker et al., 2002). Major external events affecting protected area tourism can be categorized as political (e.g., land rights, government policies or blacklisting such as the apartheid-era South Africa), economic (e.g., economic downturns, significant currency fluctuations, access

to new markets, welfare structures), infrastructure (e.g., construction of access roads, tourist accommodation and recreation facilities), technology (e.g., increased access to Internet resources and online booking systems, sophisticated marketing techniques), demographic (e.g., flux in visitor numbers, population density in protected area surrounds) and environmental/ecological (e.g., floods, droughts, species extinction).

Through this historical profile, the affect of major external events in terms of opportunities, constraints and development (*Resilience Alliance, 2007b; Walker et al., 2002*) on the protected area tourism system (of which local community is an integral part) becomes evident. Characteristically slowly changing variables that may play an important role in controlling (*Allison & Hobbs, 2006; Walker et al., 2002*) the protected area tourism system, for example population growth or cultural variables like religion or taboo systems, can be identified in part from this profile. These slow variables are a crucial aspect of the overall assessment as they may critically impact on protected area tourism. Often these slow variables are crucial in determining how a system will react following major external disturbances (*Carpenter et al., 2001*).

In their assessment of sustainability of the Goulburn-Broken catchment in Australia, *Walker et al. (2009)* found the major slow variables influencing the system to include values, economy, infrastructure, biophysical function and biodiversity. The Catchment Management Authority had only a small influence on these key slow variables, suggesting that control lies outside the influence of the local area. Control of land/water use and infrastructure instead rested with State and/or Federal Governments, with attendant (and significant) implications for system resilience and adaptive capacity. These findings are significant for the resilience of communities within protected area tourism systems, who are hypothesized as being similarly poorly disposed in terms of influence over such key slow variables, with control dictated at higher scales. Research by *Balint (2006)* draws attention to the unique nature of commons issues in protected areas, noting that in most cases, governments own and/or run the area with attendant rules and regulations. Local people are disempowered to effect change, as found by *Walker et al. (2009)*.

Initial ideas regarding drivers can be obtained through exploring community perceptions of the factors influencing key issues or impacts of protected area tourism. Again, however, community perceptions of drivers may differ from core underlying drivers facilitating change (*Resilience Alliance, 2007b*). The utility of historical analysis in aiding determination of slow variables is great, as their discovery is generally difficult owing to inadequate data and/or understanding. As such, significant uncertainty regarding such variables exists (*Walker et al., 2009*). Historical analysis is similarly useful for ascertaining disturbances influencing the protected area tourism system. The spatio-temporal frequency and nature of characteristic disturbances taking place in the protected area tourism system can be explored through a combination of community engagement and historical analysis, again

utilizing a cross-checking measure to account for subjective preferences in community perceptions.

Commonly grouped into physical, biological, economic, social or policy domains, disturbances affect how the protected area tourism system functions. Physical shocks, frequently related to weather events, may be regular occurrences such as monsoonal flooding, irregular events such as flooding and drought (Allison & Hobbs, 2006) or they can be one-off unexpected occurrences, such as earthquakes. Biological shocks commonly refer to diseases, economic shocks to events such as slumps in the global tourism market or exchange rates, social shocks to changes in visitor preferences and population issues (e.g., instability in visitor numbers) and events such as employee strikes and policy shocks to disturbances associated with governments (such as political turmoil) (Novelli & Scarth, 2007; Resilience Alliance, 2007b; Walker et al., 2002). Other shocks, such as those associated with terrorism, span several of these groupings.

### *Phase 3. Key People in the System and Understanding their Institutions*

Owing to human primacy in SES, leadership is a crucial aspect underpinning system interactions, providing opportunities for building trust, managing conflict, linking key individuals and initiating group partnerships (Olsson et al., 2006). The third phase of the framework is therefore concerned with determining systems of governance and key individuals influencing the protected area system either formally or unofficially, particularly in relation to resources and access, their interactions and the implications of such interactions on impacts experienced by a community. The identification of key authority figures or organisations in directive roles is concerned with identifying power relations (Resilience Alliance, 2007b; Ribot & Peluso, 2003) within the protected area tourism system, in terms of influence on the system, either indirectly or directly.

According to Plummer and Fennell (2009, p. 150), the ‘root cause of conflict between local people and government is...power’. Directly linked to governance, power inequities can manifest in perceptions of protected areas as representative of government power, casting them as crux points of local dissatisfaction. For most situations except those where a highly participatory governance structure is employed, it is hypothesized that protected area/tourism authorities and government will be key power holders in both a direct and indirect sense. This occurs through the setting and enforcement of policy and practice as dictated by government control operating at higher scales, in contrast to the community (although in practice this may not be the case, as in many ‘paper parks’).

Governance of a protected area tourism system concerns issues such as property rights, tenure conflicts, access matters and their transparency and acceptance by communities. Verification of authority regarding resource use and regulations and relationships between these individuals/organisations is critical (Resilience Alliance, 2007b).

Protected area tourism resources include, for example, key attractor species such as lion, medicinal plants, fuel wood, cultural sites, tourism spaces and infrastructure, the use and regulation of which affects local communities. As outlined by Ribot and Peluso (2003), the ability to benefit is dependent on access to resources, which is in turn affected by spatially and temporally dynamic individual and institutional relationships to those resources.

Emerging land and property rights are likely to be confounding issues in determining authority. Such claims are liable to impact on intra-community power relations as well as those within the protected area tourism system. Property and tenure are highlighted as only one group of factors affecting benefit derivation; others include access to technology, capital, markets, labour and labour opportunities, authority and knowledge, as well as access derived through social identity or negotiation of other social alliances (such as friendship or reciprocity) (Ribot & Peluso, 2003). Analysis of these interacting factors and their effect on impacts can be assisted by the historical profile developed previously.

Key policies, regulations and legislation facilitating or constraining resource use within the protected area tourism system need to be ascertained. For communities, these may include facilitative aspects such as protected area community liaison and benefit sharing policies, land rights legislation and sustainable and/or responsible tourism guidelines that are likely to enhance collaborative resource management. Conversely, the commonly enclave nature of protected area tourism (Mill & Morrison, 2006; Novelli & Scarth, 2007), protected area regulations concerning human habitation and resource extraction and existing communication channels act in a constraining manner, minimizing or prohibiting interaction between communities and the wider protected area tourism system.

Finally, an awareness of the scales above (e.g., State, national) and below (e.g., households/businesses) the focal protected area tourism system is required. Cross-scale linkages, be they horizontal (geographical links, i.e., across communities) or vertical (across levels of organization i.e., local to international) (Berkes, 2007) can have crucial ramifications for the focal system. As Peterson (2007) notes, state organisations (such as protected area authorities) are positioned within a network of other state organisations, similar organisations in other states, media and scientific/international organisations. The complexity inherent in such cross-scale linkages is immediately discernable. The existence of cross-scale influences demands attention, for example issues associated with reconciling European land tenure systems with traditional ownership systems, and traditional authorities with western style management boards (Resilience Alliance, 2007b).

#### *Phase 4. System Development and Thresholds*

The final phase of the framework rests on exploring the current as well as projected future state of the protected area tourism system.

Thresholds may be investigated. Resilience assessment proposes appraisal of the position of the protected area tourism system within the adaptive cycle. For example, does the protected area tourism system appear to be expanding in the forward loop (in a growth to conservation phases) or undergoing significant changes, the back loop (the release and reorganization phases) (Walker & Salt, 2006)? Largely based on the historical profile developed previously, patterns of behaviour (Allison & Hobbs, 2006) in the protected area tourism system can be observed (e.g., exploration, consolidation, decline, rejuvenation). Evolutionary cycles are ubiquitous in nature and have been identified in systems created by human society including the economy (De Greene, 1993). These stages and the cyclical nature inherent in their discovery are analogous to that presented in Butler's long-standing tourism destination life cycle model (Petrosillo et al., 2006). These two approaches differentiate around the more explicit detail given in the resilience material about adaptation.

Where the tourism system is positioned within the adaptive cycle is of interest as it relates to its likely stability (and hence the persistence of the impacts currently occurring) or conversely, propensity to change (Walker & Salt, 2006). Conceptualizations of the adaptive cycle were used by Walker et al. (2009) in their resilience assessment to argue that the Goulburn-Broken system is on the cusp of a release phase and regime shift or transformation. Allison and Hobbs (2006) similarly used the adaptive cycle metaphor to understand the history of the Western Australian wheat belt highlighting that some regions may not follow an adaptive path but enter maladaptive states such as the 'lock-in trap'. Similarly, Bramwell and Lane (2009) discuss the current economic recession in terms of an adaptive cycle for tourism, as exemplified by historical patterns of boom/bust.

Possible developmental pathways, or future scenarios, for the protected area tourism system can then be theorized in order to assist managers with future decision making. By necessity, this is conducted within a context of high uncertainty and difficulty of system control (Allison & Hobbs, 2006; Cumming et al., 2005). Based on key issues of concern for the protected area tourism system as defined by local communities, such as sustainable resource harvesting by locals or an increase in visitor numbers, conceivable alternative development pathways based on interactions between existing system dynamics and possible future events can be developed. Alternative pathways are constructed by selecting a few uncertain or uncontrollable driving forces around which scenarios can be developed, for example a fall in tourist numbers or ecosystem degradation. Each scenario is essentially a brief account that connects past and present events with hypothetical future actions, tracking key indicator variables (Peterson, Cumming, & Carpenter, 2003).

Through constructing future protected area tourism scenarios, it is possible to investigate various 'non return' points or system thresholds. Thresholds refer to some critical level which, once reached, results in a change in behaviour (Resilience Alliance, 2007a) of the protected area tourism system, preventing further progress along a particular

developmental pathway, for example, changes from a primary to tertiary economy or from productive soils to non-productive soils (Allison & Hobbs, 2006). Such thresholds can be tangible (physically observable) or behavioral, although owing to human primacy within protected area tourism systems, thresholds are likely to be behavioral in nature. In their resilience assessment, Walker et al. (2009) identify ten possible, likely and suspected thresholds for the Goulburn-Broken system.

For example, consider Indigenous Australian connection to land. After decades of institutionalized non-recognition, a threshold was reached in regards to Indigenous non-involvement in land management. Official positions changed to reflect new more inclusive attitudes, which have had marked flow-on effects for protected area and tourism management in Australia. Joint management arrangements between park authorities and traditional Aboriginal custodians initiated in a number of Australia protected areas (Langton, Rhea, & Palmer, 2005), for example Kakadu National Park, provide evidence of system behavioral change following the reaching of a tolerance threshold. A further example is provided by shifts in tourism product, for example from ecotourism to mass tourism (Newsome et al., 2002).

To date however, the discovery of system thresholds in the wider resilience arena has proven challenging, with no instances of thresholds being discovered prior to actually being experienced or derived from historical analysis (Walker & Meyers, 2004). While this may seem disheartening, it is important to note that it may be more crucial to discover factors moving a protected area tourism system towards thresholds, than it is to precisely define the thresholds themselves (Resilience Alliance, 2007a). These weak signals, or ‘thresholds of potential concern’, are probably of greater concern as, once a threshold has been reached, a system is already at crisis point and management to return the system to a previous state is made much more problematic, if at all possible (Rogers, 2003).

## CONCLUSION

This paper proposes a novel, transdisciplinary conceptual framework for investigating the impacts of protected area tourism on communities. ‘Community’ (using a geographical conceptualization) is employed as the focus for determining impacts of the wider protected area tourism system, via application of the ecologically derived principles of resilience assessment. The novel contribution of the framework lies in its transdisciplinary and distinctly stakeholder-driven approach to assessing protected area tourism, with community (and broad stakeholder) assessment of system interactions, functioning and issues of concern (impacts) deemed appropriate for assessing resilience in a future assured of increasing uncertainty and change.

The benefit of this framework lies in the ability to explicitly recognise and work with system change, complexity and uncertainty, in contrast to traditional indicator-based tourism impact methods that are based on linear assessment approaches. Highly exploratory in nature, the

framework is intended to act as a starting point for further explorations into the utility of resilience and complex systems thinking to protected area tourism. In this paper we have attempted to progress the application of resilience assessment to new sectors, as the application of resilience thinking to protected area tourism is in an embryonic stage.

Evaluation of tourism impacts has explicitly recognized the difficulty of attributing cause and effect in regards to the impacts of tourism (Deery et al., 2005), as well as the complex and often slowly emerging recognition of impacts. A key insight available from this conceptual framework concerns the potentially slowly changing nature of socio-cultural factors that may act as key drivers. Resilience and complex systems thinking can assist in conceptualizing these attributions as well as providing a systems context for better understanding how and where impacts emerge.

Issues associated with the framework include difficulties in defining and bounding the system of inquiry. Part of the complexity lies in the close participation of stakeholders inherent in this approach, as system boundaries developed are largely based on stakeholder worldviews. While not unique to protected area tourism, the issue of system definition requires careful consideration. The short term timeframes within which humans operate pose another quandary for the framework, in that many of the issues and interactions raised will be of an immediate nature. Care must be exercised to ensure longer term impacts and interactions are also considered.

Protected area tourism, and tourism itself, are immensely complex, dynamic systems. A resilience and complex systems-based approach allows for explicit recognition of this complexity, uncertainty and change and as such, the conceptual framework presented here is positioned to act and take advantage of emergent systems thinking. The practical value of the framework seems high. However, while conceptually illuminating, the practical application of this conceptual model requires validation to truly assess its methodological value and applicability to investigating the impacts of protected area tourism on communities. Research guided by, or to test components of the framework developed through this paper, will greatly assist progress in the field with regards to advancing resilience and complex systems thinking in the tourism sphere. **A**

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