REVIEW ARTICLE

J. For. 114(■):000–000
http://dx.doi.org/10.5849/jof.14-140
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social sciences

Maintaining Relevancy: Implications of Changing Societal Connections to Wilderness for Stewardship Agencies

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The growing concerns about civil society's connections with wilderness raise intriguing questions about the dynamic character of wilderness meanings and engagement. In this review, we use the notion of an adaptive cycle to suggest that our societal relationships with wilderness are dynamic and not static and that by understanding the adaptive character of connectedness and social cohesiveness, stewardship organizations will have a greater capacity to adapt and respond rather than feel threatened. For each of four stages in the adaptive cycle, we propose information and organizational needs, including leadership that is sensitive to the changing character of relevancy and that can steer an agency through change.

Keywords: adaptive cycle, wilderness relevancy, organizational learning

Is wilderness still relevant to Americans? Perhaps this is a surprising question given the nearly 110 million acres designated as wilderness in 44 states since passage of the Wilderness Act in 1964. This designation has resulted in landscapes protected from timber harvesting, mining, grazing, road construction, and other development activities. In a larger sense, wilderness provides a distinct contrast to the urbanization of our society, especially in terms of our growing demands for access via roads and electronic communication. Indeed, wilderness serves as a place to escape from the developed, mechanized, networked, and regulated society that we experience on a daily basis.

Despite this success, there is growing anxiety among managers and activists about the continuing relevancy of wilderness to Americans. Such concerns are not without a foundation. Direct experiences through visitor use to wilderness and to units of the National Park System show a leveling or apparent decline over the last quarter-century (see, for example, Shultis and More 2011, Stevens et al. 2014). Although Bowker et al. (2007) project visitation to increase slightly in the future, per capita visitation will probably decrease. The visitor population using wilderness is also aging, which translates into fewer visits and shorter trips. These trends indicate that the relationship between American society and nature and wilderness is evolving, leading to consequences that extend far beyond visitation, a concern powerfully expressed in Louv's (2005) book *Last Child in the Woods*. What is unclear is how relationships may change and whether wilderness will remain as relevant to society over the next 50 years as it has been in the past 50.

In this review, we use systems thinking to present a set of ideas concerning how organizations such as the federal-level wilderness management agencies must change to address the evolution of American society's relationship with wilderness. To organize our discussion, we use the notion of an "adaptive cycle," a concept articulated by Holling (2001), to argue that wilderness stewardship is a changing and adaptive practice responding to society's evolving relationship with wilderness. We then turn to a brief overview of the information and organizational needs in different phases of this cycle, as they too are not static. In this respect, we suggest that the kind of connectedness the public has with wilderness will most likely change rather than dissolve and that agencies must be prepared to foster and respond to those changes, taking care to guide social discourse into constructive dialogue. We conclude with some suggestions, based in the organizational culture and learning literature, about strategic actions agencies can take to address this changing

Received November 14, 2014; accepted September 28, 2015; published online November 19, 2015.

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Acknowledgments: *We thank the anonymous reviewers for their helpful comments and our colleagues who have expressed deep concerns about the relevancy of wilderness to American society.*

relationship. In presenting this argument, we use ideas more than data, as our objective is to fuel discussion about how we can more effectively inform the question of wilderness relevancy.

Growing Concerns about Relevancy and Societal Change

Wilderness is a contested concept, and although for many of us, it is no longer the "earthly realm of the powers of evil" described by Nash (2014, p. 17) in his influential history of the concept of wilderness, neither may it only be the idyllic sanctuary of contemporary backpackers. Wilderness has always been typified by changing and disputed meanings: whether it is Cronon (1996) arguing that wilderness is a social construct and thus defining it as a contrast to civilization, a notion deeply implied in the Wilderness Act of 1964, which, results in an inconsistency because society created the concept, or Solomon's (2014) provocative essay in the *New York Times* arguing that America needs to rethink the Act because the Act's definition of wilderness may no longer be salient. These debates reflect fundamental values and beliefs of American society, and as those change, so do the connections between society and wilderness.

The concerns about the shifting meanings and relevancy of wilderness to civil society were major themes expressed by many speakers and participants at the National Wilderness Conference held in October 2014 to recognize the 50th anniversary of the Wilderness Act. Speaker sessions with titles like "Engaging 18–25 Year Olds in the Values of Wilderness," "Listening to Youth: Youth Perspectives on Connecting our Peers to Wilderness," and "Engaging Urban Communities and Audiences" suggest at least some unease about the level of connectedness the American public holds with wilderness. The University of Montana Mansfield Center conference held to celebrate the 50th anniversary of the Wilderness Act more directly addressed this concern and was titled "The Storied Past, the Troubled Future: The Imperative of Wilderness at 50 Years." Wilderness managers share these concerns as well: 53% of the respondents to a 2014 survey of managers (Dawson et al. 2015) indicated that they were concerned about "disconnected urban audiences," slightly behind threats from invasive species. Concerns dealt with lack of political and financial support for management (74% of respondents), a likely reflection of the perceived disconnectedness of Americans.

Political support and funding for management of natural reserves and parks depend on a relevant connection with society—something that the first Director of the National Park Service Stephen T. Mather argued in the early 20th century (Sellars 2009). People often support priorities for funding and policy implementation on issues for which they feel some connection and saliency. Thus, if the relationship between Americans and their wilderness becomes increasingly disconnected, its "enduring" quality may be threatened through lack of funding for stewardship or even decommissioning. However, a more optimistic result may be relationships with society that are less recreational and more spiritual, therapeutic, or even appreciative of wilderness as a place of refuge from development.

Social change often means turbulence and uncertainty, not only in the larger social system but also within management organizations. Uncertainty can be threatening, particularly to organizations constructed on one kind of relationship yet ill-equipped to perceive, understand, anticipate, or otherwise deal with new kinds of relationships and demands. Currently, the dominant discourse about a changing relationship, especially as it relates to information technology and connectivity reflects deep concerns that the results of this change will be negative (Shultis 2012). American wilderness, however, is not the first conservation construct to experience the rapid transformation of its surrounding social context. In the mid-1990s, South Africa went through a massive societal transition in which relationships between government and civil society, conservation included, underwent considerable assessment, reflection, and action. In this case, many people were concerned that society would no longer have an interest in keeping national park and game reserve systems intact. During this period, South African society revisited the foundational values and purposes of national parks and made changes in their mission. For example, in their history of the evolution of people engaged in South African National Parks management, Swemmer and Taljaard (2011, p. 2) observed,

> The main aim of the SE [the new Social Ecology unit of the South African National Parks organization] was to improve strained relationships with neighboring communities, avert threats such as poaching and land grabs and respond to the general trends toward democracy in southern Africa.

This new mission is more inclusive and equitable, economically sustainable, and engaged with civil society. The net result was addition of new parks to the system rather than a reduction of interest in conservation.

In the 1930s, triggered by the massive Great Depression, the United States also experienced a fundamental transformation of its relationship with natural environments: acquisition of tax-delinquent private lands by federal, state, and local government, resulting in new parks and forests, programs designed to employ young men in the forest to enhance infrastructure, and new types of designations (e.g., National Recreation Areas) all signaled a change in relationship with the environment. Such changes in relationships are not to be unexpected in the dynam-

Management and Policy Implications

Americans' relationship with wilderness is not static, but dynamic and complex. Questions about the relevancy of wilderness need to include the long term. For managers, this means that not only must they sense changes in relationships but also they must be adaptable and resilient, be prepared for new citizen-sponsored initiatives such as citizen science and art, foster building different kinds of connections, and recognize that while on site use may decline, other trends we do not now monitor may be occurring. For policymakers, changing relationships mean that the Wilderness Act does not need to be modified as some have advocated. It does mean that wilderness stewardship organizations need to retain highly qualified and creative staff who are comfortable operating in dynamic and complex social and political environments. It also means that traditional bureaucratic alignments in stewardship organizations, formed when recreation and visitor use dominated the relationship with wilderness, may also need transformation. This will be a challenging task because the capacities and mental models policymakers and managers hold may no longer be appropriate. Furthermore, it suggests that wilderness will continue to be a major interest, politically and culturally, of the American public.

ically complex systems typifying 21st century resource management.

How the United States responds to the challenge of relevancy will depend on many issues that are as yet difficult to foresee. For example, wilderness offers a contrast to landscapes that are accessible by road and electronic communication; that contrast is dependent on how our transportation and communication systems evolve. In 50 years, technology that enables vehicles to do the driving, communicate with one another to provide updates on traffic, accessibility, and the status of permits or reservations for parking is likely to be mainstream (Wayer 2013). Communication technology we may not yet even conceive of is also likely to be as accessible as global positioning systems (GPS) currently are now. Wilderness managers cannot stop these trends. Trends will frame the context of what it means to be "remote." In a world where our machines and genetics merge and where we are as networked as we wish to be at all times (Wood 2014), wilderness may provide a very different kind of contrast than it does now. It may provide a historical sense of authentic nature. Its scarcity value may not be comparable to anything we can imagine today.

From this perspective, the question is not how wilderness can retain its relevancy to society, but how is society changing and how will those changes affect its needs for the kinds of contrast wilderness can provide. Further, how can the professionals who steward wilderness anticipate these changes and position themselves to engage them productively?

The Adaptive Cycle

In their book *Panarchy*, Gunderson and Holling (2002) proposed that social-ecological systems within which natural resources management occurs are dynamic and move through a cycle or path of change over time. They term this path of change an *adaptive cycle*. This cycle depicts how a social-ecological system (a set of social and biophysical components that interact in a dynamically complex way) changes over time. Change often occurs in response to perturbations or disturbances.

Four distinct phases characterize the path of change (Figure 1) described by the degree of connectedness among components of the system and the amount of capital present. The path follows a "figure 8" pattern with the phases termed exploitation or growth, conservation, release, and reorganization or transformation. Through this pattern, social-ecological systems are renewed and transformed. A renewed system may return to the same state or be transformed to one significantly different.

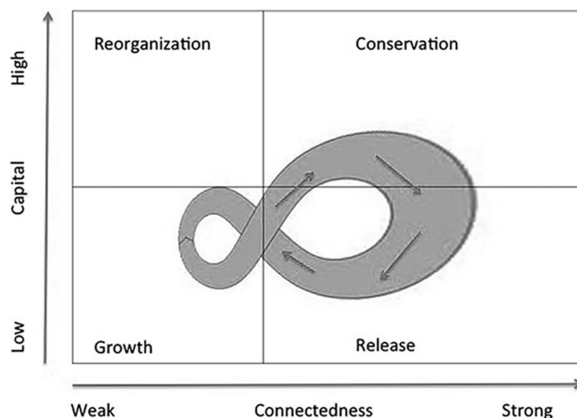

Figure 1. The adaptive cycle. (After Holling 2001.)

We illustrate the different phases of this adaptive cycle briefly by beginning at the conservation stage. This is a region where there is a high degree of connectedness as well as a high amount of capital. Systems in this phase have accumulated capital, such as nutrients stored in soil, biomass accumulated in forests, and fisheries stored in lakes. Institutional missions and policies have accumulated and hold a relatively high degree of apparent stability, agreement and legitimacy among civil society members. There also are large amounts of social capital (defined by Putnam (2000, p. 21) "as social networks and associated norms of reciprocity"), and there may be consensus on natural resource management direction or philosophy. Because of its apparent stability, a high degree of collaboration and cooperation may exist to implement consensus-based policy (Nkhata et al. 2008). We observe that the notion of stability does not imply that consensus or agreement is static because social-ecological systems are ever-changing and dynamic (Folke 2006).

However, disturbances, such as insect epidemics, wildfire, and social discord or unrest often interrupt this stability. These disturbances may lead the system into a release phase. Such disturbances are often viewed as "external" to the system, but only because the system is narrowly defined spatially or temporally, or from a social-organizational perspective. The role of fire in western US forests may be viewed as a situation that moved from the conservation phase to the release phase beginning in the late 20th century. The natural capital (biomass) stored in the system is released though energy, through transformation of mass from one form to another, or through new laws or policies and even civil and sometimes violent revolt. Relationships that were stable for some time can become adversarial and a long-established sense of community may be threatened.

After the release phase, the system begins to reorganize itself. For example, after a stand replacement fire in a lodgepole pine (*Pinus contorta*) forest, seedlings emerge, wildlife begins to populate the area again, and nutrients accumulate. A new forest emerges. After a release phase, a society begins to reorganize as well, establishing new institutions, leadership, organization, and cultural norms, such as what South Africa experienced since the initiation of democracy in 1994. People begin to form new relationships, fresh alliances emerge, and innovative visions are proposed. This reorganization phase is particularly significant in that the direction or character of the transformation may be unclear, with alternative developmental trajectories abundantly available with perhaps conflict over which choice to make.

In the growth or exploitation phase, capital (in the form of nutrients, biomass, or consensus) accumulates, organizations grow larger, and initiatives that strengthen social cohesiveness emerge. Some ideas tested in the transformation phase are implemented, and others are discarded. This phase, as it continues to grow, eventually evolves into the conservation phase, completing the adaptive cycle. The social-ecological system continues to exist, but may be transformed into something completely different, as when South Africa transformed its political system to a democratic one. The transformation of South Africa's political system also

Table 1. Example of the kinds of connections civil society may have with wilderness.

Connection type	Description
Experiential	Being within the wilderness, focusing on informal understanding of nature and natural processes, developing skills to navigate and survive in wilderness, viewing, appreciating, and enjoying nature and natural processes within wilderness
Cultural	Understanding the role of wilderness in American society, learning about and appreciating events that have occurred in wilderness
Spiritual	Seeking out particular places in wilderness to enhance one's spiritual well-being
Developmental	Being within wilderness for the purpose of enhancing one's self-esteem and well-being
Utilitarian	Depending on wilderness as a source of revenue or materials/commodities for extraction
Scientific	Formalized study of nature and natural processes within wilderness to produce knowledge, both about these processes and about how to manage uses of wilderness

Because wilderness lies within a dynamic context, the relative strength of these connections will change over time.

triggered an adaptive cycle within SANParks itself, moving it from a largely biologically oriented agency to one more focused on its role in sharing benefits from parks and continuous interaction with its constituencies.

The specific concern of Gunderson and Holling dealt with natural resources management. Here we revise slightly the adaptive cycle to address a social-ecological system, but one that focuses on wilderness and its relevancy to American society. We retain the *x*-axis notation of connectedness because of its obvious concern among managers and wilderness enthusiasts. In this context, connectedness means the type and degree of interaction between society's members and wilderness. There are numerous types of relationships between an individual and wilderness; Table 1 suggests several. For each of these types, there will be varying amounts of connectedness ranging from very little to intense. For example, some people may have an economic connection, say as outfitters, and that economic connection may be very strong, as when an outfitter's income is very dependent on a particular wilderness.

We use the notion of social cohesion or coherence on the *y*-axis in the figure. Social cohesion is a form of social capital that represents the degree to which civil society shares values about purpose and vision. Social cohesion focuses on "shared beliefs and standards of appropriate behavior" (Williams and Watson 2007, p. 124). Kawachi and Berkman (2009) indicate that social cohesion comprises two main dimensions: the absence of latent social conflict and the presence of strong social bonds. Social cohesiveness is a type of capital because it directly affects how society can get things done: the greater the cohesiveness the more willing society is to embark on programs requiring public resources to implement. Indeed, Kawachi and Berkman (2009) are explicit in arguing that cohesion is a component of capital. Conversely, where there is little social cohesiveness, society finds implementation difficult. Social cohesion represents a reservoir of social capital, knowledge, and political will.

In the following sections, we discuss the implications of the adaptive cycle for wilderness professionals who are deeply concerned about the notion of relevancy. We first propose how each phase functions in the context of wilderness and then comment on the implications for management organizations and science as they relate to each phase.

The Conservation Phase

In the conservation phase, there is a high degree of connectedness and social cohesiveness. What this means is that society holds a relationship with wilderness that it is broadly cohesive and overlaps with agency stewardship emphasis and policy. For wilderness, we believe this phase lasted from before passage of the Wilderness Act until about the 1990s. The relationship was predominantly one of wilderness as a place for special visitor recreational experiences even though other aspects of wilderness were recognized. During this period, there was (relative to today) not only greater agency budgets for management but also an emphasis on management of wilderness for recreation.

Not all parts of an adaptive cycle are synchronized. There may be varying temporal delays from subsystem to subsystem. For example, during the 1990s, the conservation phase was still in a transition from the growth phase experienced earlier: Congress, responding to its constituencies' sense of priorities, continued to add areas and acres to the National Wilderness Preservation System. The system continued to grow into the early 2000s. This continued growth represented the high level of relevancy enjoyed in the first 25–35 years of the Wilderness Act.

In many respects, management of recreation in wilderness during the conservation phase represented a "tame" problem, a term Rittel and Webber (1973) used to refer to situations where the definition of a social problem receives broad agreement or consensus and the technical pathway to its solution is relatively definable and subject to technical response. With social cohesion at a relatively high level with respect to wilderness, political will, resources, and technology were applied to resolution of recreation management problems.

There were few research projects during this phase on issues other than recreation, both physical and social dimensions. In the late 1960s, the USDA Forest Service, for example, employed about a dozen full-time scientists focused on wilderness recreation management issues, a number representing a higher investment in knowledge production than the current staffing levels.

Information and Organizational Needs during Conservation. During this phase, science emphasizes what Kuhn (1970) would probably term "normal" research: testing of hypotheses produced by conventional paradigms and theories dominate science. Inconsistent findings are not "seen" by scientists, or if found, are tossed away as being abnormal results. The search for a social or biophysical carrying capacity for recreational use of wilderness that dominated recreation research in the 1970s through the early 1990s typifies the notion of a conventional research paradigm used by social scientists during the conservation phase.

For management organizations, there are dangers lurking beneath the surface of the conservation phase, for there is a tendency to desire the comfort, often illusory, that a stable state provides. An assumption of stability brings with it a decrease in incentives to continue to learn, a lack of interest in managing adaptively, and a return to linear thinking. In this phase, it is difficult for organizations to maintain a sense of situational awareness, and thus they eventually become isolated from the larger society in which they are situated. Nyambe (2005) provides an outstanding demonstration of this situation in his study of the Natal Parks Board (NTB) in South Africa. The NTB began with the mission of recovering and protecting large mammals, particularly the white rhinoceros (*Ceratotherium simum),* in the late 1940s. It maintained a sole focus on that mission into

the 1980s and as a result became isolated from the changes occurring in the apartheid structure of South African politics and culture and societal reaction to those, to the point of almost being decommissioned; it ultimately transformed itself into a new organization with new vision, mission, and leadership.

Wilderness stewards face key questions in this phase about the underlying assumptions guiding their management and organizational strategies for change even in an era of apparent stability. The ability to be ready for change is preparedness and an assumption that the organization is changing all the time. Brown and Eisenhardt (1997, p. 1) argue that successful organizations embrace a change and learning focus. When speaking about private firms they noted, "the ability to change rapidly and continuously, especially by developing new products, is not only a core competence, it is also at the heart of their cultures."

The Release Phase

In the release phase, we would expect to see a variety of changes in relationships, some dramatic and some more subtle. The management of fire in wilderness is one example. Implicit assumptions about the character of connections between people and wilderness began to unravel when evidence accumulated that fire in some ecological regimes was a natural and expected occurrence (for a review of fire science, see Miller and Aplet 2015). We would also expect to see the influence of a variety of social and biophysical processes, such as climate change, population dynamics, conflict, economic challenges and restructuring, technology, and greater debate about the importance of natural environments and continued urbanization on society's relationship with wilderness. We see these effects in the growth of communities near places of high amenity values, including wilderness; debates about information technology in wilderness (remember geocaching? and now drones; see Wick 2015); economic restructuring in rural western communities that portended the rise of tourism based on natural environments; and conflict over protecting ancient forests in the Pacific Northwest. In the release phase, our relationship with natural environments would be embroiled in a stormy and chaotic sea turned by gale force crosswinds.

One result is a slowing in the rates of growth in visitation to wilderness and similar areas. Evidence from surveys reported by Cordell et al. (2008) reveals complex trends. Whereas the number of backpackers increased about 50% from the 1994–1995 period to the 2005–2008 period, much of this growth occurred before 2000. Visits to wilderness and primitive areas rose only about 3% from the 1999–2001 period to the 2005–2008 period. The total numbers of visits to national parks have been stable over decades, whereas visits to state parks have grown dramatically. In short, visitation as one measure of relevancy reveals a complexity and uncertainty not present in the earlier decades of designated wilderness. At the same time, we see growth in visits in some premier destinations. For example, both the Pacific Crest Trail and the Appalachian Trail are experiencing high rates of visitation growth. The National Park Service recently limited and allocated climbs to Half Dome in Yosemite National Park because of unsafe levels of demand for the climb (Pettibone et al. 2013) as visitors seek the reward of accomplishing feats of endurance and persistence. Although research is not yet available, we suggest that many visits are motivated more by challenge, social interaction, and a search for experiential trophies than by seeking solitude and natural environments. To Potts (2007, p. 5), changes in visitation are so profound that he concluded, "The danger to wilderness is no longer from recreationists who are coming to wilderness, but rather from the vast majority of Americans who are not visiting wilderness."

Aging also has an important influence (e.g., Borrie and McCool 2007, Dvorak et al. 2012) with wilderness visitors getting older. Older visitors most likely travel fewer miles in wilderness than younger ones, they may see wilderness differently than in their youth, and thus, its role—relevancy–in their lives is changing (Borrie and McCool 2007). Such changes in visitation are likely to continue into the future. Bowker et al. (2007) predicted that out to year 2050 visits to wilderness would slowly rise, but per capita participation rates would continue to drop.

Technology in particular is often blamed for the dampening of visitor use rates and shifting use patterns (see, for example, Louv 2005, Shultis 2012) with Dvorak and Borrie (2007, p. 14) arguing, "advances in technology have dramatically changed how we relate to wilderness areas." How does a visitor's GPS or navigation app on a smartphone change the relationship to wilderness? Some might argue the such technology makes the visitor less reliant on traditional skills and, thus, the sense of adventure.

Although meanings and therefore relationships have always evolved as Nash (2014) eloquently described, the 1990s saw the beginnings of postmodernist critiques of the meanings established in the Wilderness Act. Callicot and Nelson (1998), for example, argued that wilderness is a socially constructed concept applied to a landscape by dominant social subgroups. The notion of wilderness as a landscape empty of human occupation and influence was never based in reality, they argue, but rather was the construction of a romantic ideal of a particular social subgroup. The important point in this discussion is not the validity of the postmodern critique but rather that it occurred. This critique is a significant departure from earlier descriptions of wilderness meanings as postmodern constructivist views represent a very different paradigm of the world than modernism. Critiques of constructivist perspectives of wilderness by Crist (2004), Willers (2001), and Soulé (1995) were systemic, not operational, in their character. Diversity in paradigm-based descriptions of relationships, by definition reflects reductions in social cohesiveness on meanings as illustrated by the two schools of thought mentioned here.

Debates about whether the Wilderness Act prescribed naturalness or wildness as the principal objective arose as well (e.g., Yung and Cole 2010), suggesting that society, scientists, and stewards not only were gaining knowledge but also had begun to realize that the Act posed some significant philosophical questions relative to management policy: were managers guardians or gardeners? Such philosophical questions are raised when concrete proposals, for example, manager-ignited wildfire prescriptions, are suggested to "correct" decades of effective fire suppression in areas now designated wilderness.

In addition, the scientific community widened its interest in wilderness, particularly with respect to the role of naturally occurring wildfire in shaping landscapes, population dynamics of wildlife, and eventually in understanding the connections among these (see, for example, the five volumes of the National Wilderness Science Conference held in 1999). Science was an original purpose of wilderness, but the broader scientific community did not immediately begin exploiting this resource to create better understanding of how the natural world operates right away.

Growing ethnic diversity in America has meant a significant broadening of the society that defines connections with wilderness. As the character of these connections broadens, we expect social cohesiveness to also weaken because of culturally divergent engagement with wild landscapes. For example, Johnson et al. (2004) report in their study of the influence of race and ethnicity on wilderness values that minorities were less likely than whites to hold values toward wilderness based on visitation, but more likely to share "existence" values. Moreover, since such existence values constitute the majority of perceived benefits from wilderness, they believe that support for wilderness will probably not diminish in the future as the diversity of the American public rises.

We expect that meanings attached to landscapes would vary significantly among cultures and subcultures (Greider and Garkovich 1994, Brehm 2007). These variances have significant implications for people's behavior, e.g., if you see wilderness as a sanctuary, your behavior may be different from those who see it as place for adventure, and consequently for the type of management needed. Management is faced with the question of "Who do they manage for?" a question that underlies decisionmaking even in the other phases of the adaptive cycle.

Finally, we note the rise of volunteer groups, "friends" organizations, and citizen science as adjuncts to conventional wilderness stewardship. These new thrusts, for which few data exists to help in our understanding, reflect the growth of a significantly different relationship between wilderness and society: wilderness is no longer limited to the recreational domain of civil society; it is changing into one that is to some extent utilitarian, educational, and philanthropic.

In summary, the relationship between wilderness and American society is clearly in a state of change. For example, Solomon (2014) suggested tossing out the "hands-off" philosophy that has guided our stewardship for 50 years and become the gardeners that Howard Zahniser argued against. The release phase is particularly problematic to grasp because cause-effect relationships are hard to discern and confirm; many hypotheses abound, and evidence that contradicts the underlying assumptions about this relationship may not be considered because strongly held mental models filter out data.

Whereas the release phase is characterized by relatively high levels of connectedness, it displays comparatively rapid decreases in social cohesion; that is, society develops progressively more diverse relationships with wilderness. During this phase, wilderness constituencies may express worries about the conventional relationship as it begins to be replaced by others, leading to the word recently used by wilderness managers, "disconnected."

Informational and Organizational Needs during Release. The release phase and the following reorganization phase are particularly challenging periods for federal agency wilderness stewards. Although civil society maintains its relationships, their increased variety means that many voices rise to provide agencies with advice about management and planning. Agencies are populated mostly with personnel who most likely subscribe to the dominant relationship in the previous conservation phase and thus may question the legitimacy or necessity of new types of connections. In a sense, a bundle of meanings vies and competes for the agency's attention and resources while traditional missions are being challenged. For example, managers worry about technology and its effects; many years ago, managers were more concerned about the consequences of the use of GPS receivers in encouraging visitor use than they were enthusiastic about wilderness becoming more attractive as a place for a new relationship with society.

In this phase, investments in research and public engagement may be particularly worthy to help identify new types of connections and their implications for management. For example, growing ethnic diversity provides motivation for managers to engage new groups to determine how they may see wilderness and what are useful, and legal, ways to engage it. For example, communication and information technology have been of increasing concern to wilderness managers because they believe these disrupt the visitor's experience. However, Generations Y and Z or Millennials may view this technology as enhancing their experience. Therefore, managers may be well advised to exploit the interest in this technology to help visitors learn from the wilderness rather than oppose all new technology.

In this phase, organizations receive a high amount of what appears to be "disconfirming" information, information that "shows the organization that some of its goals are not being met…" (Schein 2010, p. 301). This information, Schein observes, makes individuals within the organization uncomfortable, creating a sort of "survival anxiety" suggesting that unless the organization changes, something "bad" will happen to the individual—such as being released—or to the organization itself. Wilderness organizations will need to monitor the effects of disconfirming information, such as the manager concerns with connectedness we noted earlier.

Organizations will need a high degree of situational awareness in this phase, as they seek to monitor, assess, and reflect on how and why social cohesiveness is changing and the causal factors underlying that change. Situational awareness is a foundation to understanding and making sense of what is going on: Klein et al. (2006, p. 71) define sense making as "a motivated, continuous effort to understand connections (which can be among people, places, and events) to anticipate their trajectories and act effectively." Alternatively, sense making may be viewed as placing events into some kind of framework to promote communication among constituencies, understanding and gaining insights that will improve decisionmaking in the future.

A key question stewards face in this phase is how to manage wilderness in such a way that options for different kinds of possible connections are maintained in a turbulent and uncertain environment. In this "postnormal" condition (a term developed by Funtowicz and Ravetz 1993, p. 744), there is considerable decisionmaking ambiguity as "facts are uncertain, values in dispute, stakes high and decisions urgent." Scenario planning is a method of identifying potential future conditions or states and then testing what policies might be robust across them (Peterson et al. 2003). As a result, it may be one way to identify robust management trajectories in the face of uncertainty and an ever-changing context. In this respect, innovative programs may be useful in testing the kind of connectedness that seems to be occurring.

The Reorganization Phase

During the reorganization phase, energy is devoted to transformation. There is a reduction in connectedness while at the same time society begins to rebuild the social cohesion lost in the release phase. There may be many interests operating in this phase, each attempting to identify and develop a new sense of connectedness with differing types of relationships, based on ethnic and cultural values or generational priorities.

Thus, we would find older wilderness-oriented organizations themselves undergoing some kind of transformation as they seek the type of relationship that will not only rebuild connectedness but also advance social cohesion. They also may be asking themselves what niche or role they play in a landscape of social change and possibility. We might find debates among their membership about the group's vision and mission and loss in membership as members consider whether the group continues to represent their own perspectives, which themselves may be changing; we might also find groups struggling to maintain financial sustainability and influence when dissension about their vision enters the ranks.

The dynamic character of connectedness is dramatically illustrated in this phase, and for that reason, focusing on visitation statistics as a measure of that connectedness results in a very narrow depiction of relevancy. Connections may broaden and include volunteer interpreters, trail crews, science technicians, and other links we currently do not foresee.

For the stewardship agencies, a loss of staff is likely, as society's apparently more limited relationship with wilderness results in a reduction in consensus and political will. The agencies may also be searching for ways to reestablish society's connectedness, but in so doing may make assumptions that the world is stable when it is not, particularly with respect to social cohesion; programs that once worked in developing passion about wilderness may no longer work. Agencies will find themselves examining ways to collaborate and partner with nongovernmental groups not only to get work done (work defined by the old vision but also by potential new visions) but also to establish new relationships with those who support the general idea of wilderness. These changes may occur with the context of social redefinition of governance and government. Within the agencies themselves, there may be heightened discourse about the future and what trajectory of relationship building should take place. Such discourse may fundamentally transform the agency's relationship to wilderness as well as to its constituencies.

During this reorganization phase, a new order of social cohesion is built out of the many that have been tested and found wanting, and at the same time there will be a loss of connectedness. That loss may be principally with the constituencies developed during the initial (in this case) conservation phase. This may mean a loss of constituencies formed around an experiential and principally recreational relationship. The reorganization phase will arrive at a new social cohesion that includes the experiential component of the relationship but at a lower level of relative significance.

Information and Organizational Needs during Reorganization. During this phase, organizations need to be tolerant of various perspectives and encourage dialogue built around uncovering and testing various connections while maintaining the character of the wilderness resource. Management of relationships with various constituencies will be particularly challenging as they themselves evolve and reconnect in various ways, sometimes in a temporary manner. Leaders themselves may change, leading to changes in organizational vision. Organizations will need to ensure that their capability for learning is not reduced in this period; in particular they need to avoid Senge's (1990) organizational learning disability "I am my position" where staff define their role strictly by job description, e.g., a wilderness ranger is defined as a person who is solely concerned with patrol and law enforcement rather than a steward who protects wilderness. This learning disability leads to rigidly defined performance in a period when broader perspectives are needed.

Scientists can help wilderness organizations immensely during this phase by identifying competing or overlapping connections, who holds them, and their consequences to wilderness. Change may be dramatic, and coaching an organization through change may require outside expertise (Bridges 2009). Objective scientific perspectives will be critical as issues tend to be emotional and reality can be interpreted in many ways. As Bridges notes, it is not necessarily the endpoint that leads to organizational dysfunction, but rather the changes needed within the organization to get there.

A key question for wilderness stewards concerns the role they play during this phase. Stewardship organizations reflect society's preferences and value ordering. So do stewards facilitate the social discourse oriented toward finding society's connectedness and enable in some way development of social cohesion around a new kind of connectedness, or do they sit back and follow? Here again, not only is sensitive leadership needed but also a culture of learning needs cultivation.

The Growth Phase

During this phase, relationships that many find attractive, relevant, and useful develop. The transformation may be complete, or it could be a restatement of a former set of relationships, such as the recreation-based relationship. Over time, one particular kind of relevancy may begin to become popular and exhibit the sort of growth and spread suggested by Rogers (1962) in his seminal work on dissemination of innovations. New ideas are first adopted and tested by individuals who tend to be more "cosmopolitan," that is, people with a wide variety of connections. As these early adopters gain experience, others see their success and adopt the idea—which in this situation is a particular type of meaning or connection with wilderness. An example may be the rising interest in "friends" groups and their increasing significance in trail maintenance. Over time, connectedness and social cohesion are rebuilt, moving toward a conservation phase like the one we have previously experienced. This may take decades: after all, American society's relationship with wilderness, defined principally in terms of recreational experiences, did not arise immediately and hit its peak 30 some years after the passage of the Wilderness Act.

Our suspicions are that recreation as one relationship will continue, but at a lower level of relevancy than in the past. Society will strengthen its interest in technology as a means to deal with resource management (e.g., electronic tablet technology to conduct inventory and mapping) and as a way of relating to wilderness. At the same time, we may see more interest in utilitarian relationships with natural areas, including wilderness, as the world's population continues to grow toward an estimated 9.6 billion by 2050 (United Nations, Department of Economic and Social Affairs, Population Division 2013), many of whom will be living in poverty and be directly dependent on access to resources. Of course, agencies and organizations may respond to the change in experiential relationships with a variety of strategies to reestablish their former significance.

Whereas securing an "enduring resource" of wilderness has been a focus of stewardship, scientific, historical, recreational and educational purposes are also paramount within the Act. The next conservation phase of wilderness may place a greater emphasis on these purposes. If agency capacity to manage wilderness is lower when the next conservation phase

emerges, we may see a dominant management paradigm in which citizen monitoring, stewardship, and science are the focus and in which agency professionals act as facilitators, leaders, and teachers, roles that we observed at the National Wilderness Conference in October 2014. Wilderness may also be viewed as the ideal outside laboratory where students from grade school on can view, learn about, and appreciate natural processes; where scientists may make startling discoveries about how nature works; and where people of all ages and capacities contribute their energy and enthusiasm to removing alien plants, maintaining trails, and doing interpretive work but where the proportion of American society that actually visits a wilderness area is smaller than it was in the past.

Information and Organizational Needs during Growth. This is a phase of consolidation as well as expansion in the organization, of bright prospects, and of accelerating enthusiasm. Organizations may even become sufficiently zealous that they compete for resources with other similar agencies. Information about their constituencies' desires, preferences, characteristics, and attributes of how they "use" wilderness will help guide agencies along a path leading to more effective and equitable delivery of services. This information will probably result in new kinds of positions and hiring of nontraditional employees having different areas of expertise and operating perhaps in ways very different from those of the past.

We note that there may be conflicting trends operating even in the growth phase because different parts of society and varying constituencies may be at different points along the adaptive cycle path. So, although Congress may be adding areas to the National Wilderness Preservation System, it may also be reducing agency budgets. In the growth phase, agencies are challenged to deal with this apparent contradiction and through research on their constituencies and reframing of their mission may successfully find alternative funding sources.

A key question for the federal wilderness agencies concerns their ability to perceive what possible new connections may be evolving and how to interact with their constituencies to ensure that the proper resources are available to advance new socially cohesive meanings within the context of the Wilderness Act. This may require the type of visionary leadership exhibited in the early days of agency wilderness designations.

Figure 2. If any natural attribute could symbolize the changing relationships between society and wilderness, it would be water. Water flowing out of the Selway-Bitterroot Wilderness as Kootenai Creek in western Montana was initially viewed in a utilitarian sense as it provided the irrigation needed for farms in the Bitterroot Valley and the habitat for fish and wildlife that could be harvested. Contemporary visitors see water in a more aesthetic sense, as a resource that adds value to a wilderness recreational experience (McCool et al. 2008). Photo credit: Stephen F. McCool.

Conclusion

The relationship between wilderness and civil society is neither static nor linear. Rather, it is ever-changing and dynamic (Figure 2). At times, civil society's connection appears stable with a socially cohesive meaning, but large-scale forces, such as climate change, population dynamics, public values, technology, and so on "disturb" this coherency and set off a series of processes leading to a transformation in relevancy. The apparent loss of connectedness appears when assumptions are made that civil society's relationships with wilderness are stable; in reality, these connections are always in a state of change. Various constituencies are affected differently by different forces and consequently their own connectedness and internal cohesiveness are likewise changing. The result may be that various constituencies are located at different "locations" along the adaptive cycle.

In the early 1960s, connectedness with wilderness converged among constituencies, leading to a high degree of social cohesiveness and thus passage of the Wilderness Act. In addition, for many years, that condition was maintained. However, the 21st century has provided many new challenges to the adaptive ability of wilderness organizations: growing concerns about climate change, dramatic shifts in perceptions of what functions are assigned to government, and also changes in governance. We suspect that these changes have led to the release and reorganization phases in wilderness stewardship, suggesting some to argue that wilderness needs a redefinition as we noted earlier. Rather than emphasizing the dynamic nature of society's relationship with wilderness, these critiques assume that changing the Wilderness Act will solve the apparent connectedness challenges we currently experience. From our perspective, the Act itself has already demonstrated that it can accommodate a broad range of conditions and managerial arrangements and a focus on a variety of purposes. Changing the act itself is not necessary; its implementation, however, will be affected by a changing society.

Whereas visitation trends may alarm managers and activists, we must remember that recreational visitation is only one kind of relationship that society holds with wilderness. Visitation trends experienced over the last 20 years or so do not necessary herald a loss of relevancy, only that the basis for connectedness may be changing. Defining relevancy on the basis of visitation trends may not serve wilderness organizations well and may have a negative impact on their relevancy as well.

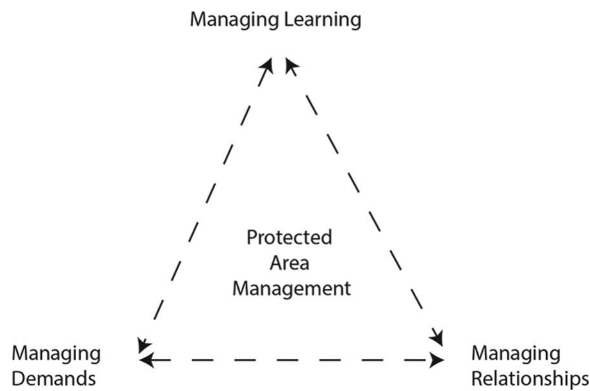

Figure 3. Three tasks protected area agencies, such as the federal-level wilderness stewardship agency, engage in during eras of change and uncertainty. (Source: McCool et al. 2013.)

Wilderness exists within a hierarchal and nested set of social-ecological systems. Those systems contain many components that are both loosely and tightly coupled. Using systems and complexity thinking will help agencies guide themselves along the adaptive cycle pathway (McCool et al. 2015). In this system, managers have three principal tasks as shown in Figure 3: managing the learning that is needed within the dynamic context of change and uncertainty, managing relationships with the constituencies that express different connections with wilderness, and managing demands on wilderness resulting from those connections that are both partly competing and partly overlapping (McCool et al. 2013). Each of these tasks will take on a different character and different priorities in each of the phases.

These tasks will require leadership with different qualities in each of the phases. In the release phase, leaders will have to attend to declining morale and a sense of loss as the enthusiasm and energy accumulated in agency staff during the growth and conservation phases give way. During the reorganization phase, visionary leadership will be needed to guide the organization in its search for a socially relevant role as leaders such as John Muir, Gifford Pinchot, and Stephen T. Mather demonstrated in the early decades of the conservation movement. In the growth and conservation phases, leadership that is bureaucratically strategic in the sense of identifying and lobbying for allocation of resources is needed.

Adaptive management or stewardship is an essential ingredient for organizations embedded in systems that are always changing. The adaptive cycle provides a useful perspective on civil society's connectedness to wilderness. but the character of the connections will change. Guiding both agencies and nongovernmental groups along this path requires understanding, leadership, monitoring, and reflection.

If, as we propose here, connections and cohesiveness are always in a state of change, science plays important roles, for both biophysical and social sciences. It remains a laboratory not only for understanding ecological processes but also for understanding and managing its potential for therapeutic values, for renewal of the human spirit, for documenting how people may affect the environment, and for understanding the dynamics of relationships. Scientists can also play roles in simply querying wilderness organizations to seek clarity in their understanding of civil society's relationships with wilderness and in depicting areas of agreement and discord.

Those who are speculating on how our society will be different in the future agree that the pace and scope of change that we experience in the next 50 years will dwarf that of the past 50 years. Thus, in the next conservation phase we can expect a dominant paradigm of wilderness stewardship that reflects a new arrangement of relationships between wilderness and civil society. Advances in miniaturization of technology, computing ability, accessibility of technology and connectivity, energy production, transportation, social mobility, and medicine will drive social change. Whereas some people will be less physically connected to wild nature, others will have the ability to move closer to it. The qualities we currently ascribe to wilderness such as naturalness, wildness, remoteness, and lack of development will only increase in scarcity and value. Those meanings could spur a resurgence in demand for physical experiences. Short of that, however, there will be a role for wilderness as a contrast to development, much as there was in the 1960s and today.

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