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Igniting Research for Outdoor Recreation: Linking Science, Policy, and Action

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Cover photos clockwise from top left: African-American women's walking group in forest near Tacoma, Washington; photo by Trina Baker. Hiker at Olympic National Park, Washington; photo by Keith Routman. Cross-country skier at Mount Hood, Oregon; photo by Jason Blake. Duwamish Valley Youth Corps, Seattle, Washington; photo by Carmen Martinez.

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Steven Selin, Lee K. Cerveny, Dale J. Blahna, and Anna B. Miller, Editors

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Abstract

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Public lands provide opportunities and settings for people to experience nature and the outdoors. These outdoor experiences are important for human health and well-being and result in visitor spending that benefits local communities. This report shows that new research, tools, and frameworks are needed to help us find new ways to conceptualize outdoor recreation and enhance the ability of public land managers to provide outdoor experiences while protecting natural and cultural resources. The report originated from a set of 17 working papers that were developed as part of an initiative among researchers, managers, and policymakers to "ignite the science of outdoor recreation." These papers were presented at a 2018 science workshop in Golden, Colorado, that convened 88 outdoor recreation professionals to explore high-priority issues, information needs, and research directions. Their intent was to stimulate further questions, catalyze new thinking about recreation, and prompt institutional changes in how outdoor recreation and tourism are planned and managed on public lands.

Keywords: Outdoor recreation, tourism, public lands, research.

Contents

Prologue

Lee K. Cerveny, Dale J. Blahna, Steven Selin, and Stephen F. McCool[1]

Our public lands generate significant societal benefits to people who seek outdoor experiences or connections to nature, or who rely on natural resources to support everyday needs as well as traditional or cultural activities. There is growing recognition that our parks, forests, monuments, and refuges are not only a place to engage in outdoor leisure activities but also are important for individual and community health and livelihood. Being outdoors in a natural setting has been shown to benefit people in a variety of ways—improving fitness, health, and cognition and reducing stress. Use of public lands also is essential for maintaining livelihoods, traditions, and cultural practices. Visitors to public lands provide economic benefits to host communities, generating an important source of local employment as well as new challenges associated with an influx of visitors, entrepreneurs, and amenity migrants.

In many parts of the world, the capacity of public agencies to provide for sustainable recreation and tourism in parks and protected areas has decreased, while visitation has been stable or rising. In the United States, population growth is expected to generate increased visitation to public lands (White et al. 2016). As the U.S. population diversifies, visitors to public lands bring an expanding range of ideas about nature and outdoor recreation. Changing leisure preferences, new technologies, urbanization, and other societal trends have resulted in changing recreation use patterns on public lands. Recreation managers and the scientific community are struggling to keep pace with this rapid social change.

Given the social, economic, and cultural changes of the 21st century, new research methods, planning tools, and management approaches will be needed. This general technical report examines outdoor recreation management through the holistic lens of social-ecological sustainability. To help with understanding of the factors and processes that support sustainable recreation and tourism management, recreation and tourism on public lands can be strategically viewed as a dynamic social-ecological system. The 17 chapters in this report identify current gaps in recreation management and research and describe emerging tools for sustainable recreation management. They also promote adoption of a collaborative research agenda to support sustainable recreation management on public lands.

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Understanding the variety of ways that public lands and natural resources provide benefits to people can inform resource managers seeking to balance public use with resource conservation. Recreation and tourism management benefits from (1) an understanding of human wants and needs, (2) awareness of the distribution of impacts of visitation (on the natural and social environment), and (3) a systems approach that sees recreation and tourism as part of a larger set of economic and social forces. When thinking about sustainable recreation and tourism, a fundamental question to ask is: "What are we seeking to sustain?"

New approaches and programs can inform resource managers eager to connect people with the great outdoors and ensure equitable distribution of the health benefits of nature connections.

New approaches and programs can inform resource managers eager to connect people with the great outdoors and ensure equitable distribution of the health benefits of nature connections. Our standard approaches for conceptualizing and managing recreation are based on outdated assumptions that focus on human impacts and conflicts rather than human benefits. Management tools that encourage visitation and diversity while simultaneously reducing environmental impacts of recreation are being sought. Human connections to public lands and changing public demands complicate the traditional image of recreation as leisure time and discretionary activities. Public land management agencies seek ways to understand and incorporate different cultural meanings and linkages to land and to foster diversity, equity, and inclusion; co-manage lands with multiple partners; and consider community and ecological resilience. These shifts suggest the need for a new paradigm of outdoor recreation that is more appropriate to today's conditions.

Charting a Path Forward

The United Nations declared 2017 to be the "International Year of Sustainable Tourism for Development," which prompted a group of 14 resource managers, policymakers, recreation researchers, and practitioners to gather in Seattle, Washington, to discuss information needs about sustainable recreation and tourism in the context of public lands management. The meeting's purpose was to assess the state of public lands recreation and tourism research being conducted primarily in the United States, as well as to share knowledge of international management needs, processes, and developments. Several important observations were made:

1. There has been a shift away from research related to recreation and tourism on public lands, both among agency scientists and universities.
2. There has been a corresponding loss of community and connection among recreation professionals, including both managers and researchers, which may be impeding the best use of science-based applications in land management agencies.

3. New approaches and innovations are being developed, but these approaches are not always reaching the hands of agency planners.
4. Public demands for natural resources are shifting, and our public lands are not being accessed or appreciated by all.
5. Land management agencies are striving to attract a diversity of visitors to public lands and to encourage collaboration with communities, stakeholders, and indigenous groups.

During the Seattle gathering, the group decided to help reinvigorate the research focus on recreation and tourism and build a stronger sense of community between managers and scientists. A first step was to assess the roots of the problem and address challenges and opportunities head on. The Seattle group reached out to others with expertise and initially drafted 11 working papers to identify different threads or themes associated with sustainable recreation and tourism on public lands. These papers were shared with participants of the Sustainable Recreation Research Workshop in Golden, Colorado (April 2018). Working papers were then revised based on feedback from workshop participants. Four additional papers were drafted by teams of workshop attendees to address new topics. The set of 15 papers was circulated to five reviewers, who gave extensive feedback. Based on reviewer input, topics for two additional papers were identified, bringing the volume to 17 working papers, all of which have since been subjected to peer review. This report, in which each paper appears as a chapter, is the product of these efforts.

The purpose of this report is to stimulate ideas, ignite conversation, promote deliberation, and build momentum for a renewed focus on outdoor recreation and nature connection to public lands. We this report not as a definitive summation of future research needs or topics, but as a first step that we hope will prompt others to respond, collaborate, and build upon. Our intent is to build a community of practice around sustainable management of recreation and tourism on public lands and to provide a foundation for building a research agenda that outlines guidelines for the next generation of recreation and tourism research and development.

Crosscutting Themes of Working Papers

This reports reflect the emerging priorities of **sustainability science** (Kates 2011, Selin 2017), "an emerging field of research dealing with the interactions between natural and human systems and with how those interactions affect the challenges of sustainability—meeting the needs of present and future generations while substantially reducing poverty and conserving the planet's life support system" (Kates 2011). The challenges of managing for sustainable recreation and tourism on public lands are central to this burgeoning field of study. An analogous application

of this view of sustainability is that outdoor recreation management should strive to increase group and individual connections to public lands while simultaneously reducing the environmental impacts of use (Keough and Blahna 2006). This report is dedicated to elaborating and applying the emerging theory, methods, and analytic planning tools of sustainability science to the challenges of managing for sustainable recreation. Its aim is to deepen our understanding of the complex social-ecological systems (Folke 2006) that support sustainable recreation management. Emerging planning and management tools such human ecology mapping (McClain et al. 2013), collaboration, and shared stewardship partnerships provide planners and managers with important new tools to sustain quality recreation experiences on public lands for diverse users. Finally, powerful sustainable science research methods such as social network analysis (Fliervoet et al. 2016) are helping researchers and managers strengthen the adaptive capacity of individuals, organizations, and communities.

Management themes elaborated in this report—collaboration, citizen participation, inclusion, integrated management systems, capacity building, governance, ecosystem services, resilience, and many more—are critical topics of deliberation within the sustainability science discipline. Our goal, in keeping with sustainability science tradition, is to suggest how to best integrate scientific knowledge with policymaking and management action to catalyze sustainable recreation outcomes on public lands. This will practically happen by forming problem-oriented and place-based research-management partnerships to elaborate and apply the lessons of this sustainable science theory, methods, and analytic planning tools.

Sustainable recreation is not simply about providing recreation opportunities and quality visitor experiences, but also the social, cultural, economic, and ecological effects of recreation, the managerial capacity to provide for recreation, and the conservation of landscapes and lifeways on which resource-based recreation and tourism depend.

What to Sustain?

As noted above, when we were considering sustainable recreation and tourism, one question we asked is "What is it that recreation and tourism should sustain?" This phrasing framed our focus and adjusted our thinking about sustainability.

Although this question may seem to have a simple answer—that we are to sustain quality recreation experiences—a full range of responses might include the integrity of ecological systems, clean air and water, wildlife and fish habitat, thriving rural communities and livelihoods, vibrant tribal connections with landscapes, healthy economies, strong agency identities, respect for local histories, protection of cultural sites, working forests, and an abundance of recreation opportunities and settings for an increasingly diverse range of visitors. In talking about what to sustain, we also might consider sustaining the relevancy of public lands and the agencies charged with stewarding them. Sustainable recreation is not simply about providing recreation opportunities and quality visitor experiences, but also the social, cultural, economic, and ecological effects of recreation, the

managerial capacity to provide for recreation, and the conservation of landscapes and lifeways on which resource-based recreation and tourism depend.

Sustainability is an inherently wicked problem (Allen and Gould 1986). That is, decisions as to what activities, connections, and uses to sustain, where these activities should occur, and whose values should be prioritized all require value judgments by land managers. Such decisions require difficult tradeoffs. Resource planners rely on reliable and valid data to evaluate decision options. Common today are planning processes that elevate the importance of system-condition data, which skips over the first and most important questions about what should be sustained. The chapters of this report were conceptualized and drafted with this question in mind.

Our Approach

This report represents the ideas of a small group of people who are passionate about their collective ability to plan and manage public lands for outdoor recreation and nature connection. We asked the authors to organize their remarks using a similar template. First, authors identified the "problem," or recreation needs or challenges that are not currently being addressed, and clarified the problem dimensions. Next, they noted challenges or barriers that affect the problem, identified new opportunities or developments that could shed light on it, and suggested future information needs or research questions.

The chapters are organized into four parts. Part 1 focuses on establishing the need for change and understanding why it is important to invest in new knowledge and tools for outdoor recreation on public lands. Chapters 1 through 4 suggest the need for a new paradigm for outdoor recreation; explore opportunities and constraints in our capacity to manage recreation; argue for an expanded focus on diversity, equity, and inclusion; and note the importance of how we talk about recreation. In part 2, chapters 5 through 9 expand our ideas about the "recreation experience" and explore how we can learn from other disciplines and settings. In part 3, chapters 10 through 13 present useful conceptual frameworks and directions for thinking about recreation, including system theory, organizational change, and integration. Finally, chapters 14 through 17 in part 4 share ideas about specific recreation planning and management frameworks and approaches.

We hope that each chapter will stimulate your own ideas and raise further questions to consider in your professional networks. It is time to reinvigorate a field of research and management that has waned in recent years, despite the fact it is actually increasing in importance for both people and landscapes whose health is dependent on wise management choices. It is time to reengage our focus and bring our best ideas to bear on this matter of sustainable recreation and tourism.

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Part I: Why "Reignite" Outdoor Recreation Research and Practice?

Chapter 1: The Shifting Outdoor Recreation Paradigm: Time for Change

Dale J. Blahna, Francisco Valenzuela, Steven Selin, Lee K. Cerveny, Mike Schlafmann, and Stephen F. McCool[1]

> Scientists, just like the rest of humanity, carry out their day-to-day affairs, within a framework of presuppositions about what constitutes a problem, a solution, and a method. Such a background of shared assumptions make up a paradigm, and at any given time a particular scientific community will have a prevailing paradigm that shapes and directs work in the field.
>
> —John L. Casti, *Paradigms Lost: Tackling the Unanswered Mysteries of Modern Science* (1989)

Introduction

Outdoor recreation management on public lands is at a crossroads both at home and abroad. The number of visitors is increasing in the United States, and visitor expenditures are creating economic benefits exceeding those of any other resource production contributions for the national economy and for many rural communities near public lands (Rosenberger 2018, Rosenberger et al. 2017, White et al. 2016). Open space and recreation access provided by federal lands are key population and development drivers in rural communities (Headwaters Economics 2019, White et al. 2016). A deepening recognition of the personal and community benefits of human contact with nature are spawning burgeoning new areas of research and practice, such as "cultural ecosystem services" in economics (Chan et al. 2012), "nature's contributions to people" in biology (Diaz et al. 2018), and "parks prescriptions" in medicine (Frumkin et al. 2017, Rosenberger and Dunn 2018, Williams 2017). Yet, the National Park Service and U.S. Forest Service each have multi-billion-dollar backlogs of deferred recreation maintenance (Kilmer and Nordstrom 2019, USDA OIG 2017). Agency budgets and appropriated funding for national forest recreation have steadily decreased over time (Cerveny et al. 2019, Selin 2018). Field managers, nongovernmental organizations, and local and state

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governments all have identified inconsistencies between the many and diverse public values and impacts of outdoor recreation and existing policies and funding for recreation management on public lands.

These and other anomalies discussed throughout this report reflect a significant disconnection between public recreation needs and existing land management policies and practices. This introductory chapter describes the current and emerging paradigms of outdoor recreation and a few key assumptions and barriers that will influence adoption of a new paradigm. Although our focus is on outdoor recreation research and practice in the United States, we believe the ideas apply internationally, as many countries look to American universities and agencies as leaders in outdoor recreation and protected area management. We do not consider this chapter to be a definitive statement on the subject; our intent is to present a set of ideas that we hope will serve as a springboard to reinvigorate future practice and research in outdoor recreation.

What Is a "Paradigm Shift?"

Paradigms are broad and widely accepted beliefs about the way the world works. They are based on generally accepted rules and assumptions originating from existing beliefs and evidence during a particular period. But paradigms and the assumptions on which they are based are culturally constructed, especially in social science, economics, and public policy (Blyth 2013). Paradigms are built on combinations of selected factual knowledge, institutional traditions, personal beliefs, and dominant cultural values. Assumptions gradually change over time to better reflect inconsistent observations or "anomalies" that emerge and do not fit, or seem to contradict, the existing paradigm, and cultural values often change before institutions and traditions. When enough evidence emerges, assumptions change and a "paradigm shift" occurs that establishes a foundation for a new way of thinking about the topic. A classic example of a paradigm shift was the rejection of the geocentric (earth-centered) solar system in favor of the heliocentric (sun-centered) solar system. Once the heliocentric approach was widely accepted, it changed the way people conceptualized their world. Kuhn (1970) referred to such large-scale and science-based paradigm shifts as "scientific revolutions." New paradigms emerge in all fields of research and practice, such as germ theory in medicine, democracy and private property rights in public administration, and borrowing on credit in economics, which literally enabled Europeans to conquer the world in the 15th and 16th centuries (Harari 2015).

Although most paradigm shifts are not that dramatic, they still have significant impacts, especially within specific fields of study or management. In natural resources, for example, decades of evidence of the ecological benefits of fire, along

with mounting economic and political consequences of fire suppression, led to a paradigm shift from forest fire being defined as "evil," and extinguishing all fires as the only acceptable management practice, to the science of fire ecology, which led to dramatic changes in fire management practices. Likewise, research showing that ecological collapses, such as one on the Kaibab Plateau in Arizona that resulted from deer management practices, led to the shift from "game management," which focuses on single preferred species, to "wildlife ecology and management," which focuses on the wildlife and ecological integrity of entire ecosystems (Bolen and Robinson 2003).

In outdoor recreation, however, a much different type of paradigm shift occurred. In general, the outdoor recreation paradigm tended to focus narrowly on the social science of visitor experiences, satisfaction, and economic values, while recreation ecology focused on the environmental impacts of recreation. A few integrative models were developed, such as VERP (visitor experience and resource protection) and LAC (limits of acceptable change), but these tools tend to be used rarely (Cerveny et al. 2011) and they never grew or evolved into landscape-level models that could play key roles in decisionmaking or management planning like forest growth and yield, wildlife habitat, and fire spread models. Despite its central role in social-ecological systems, outdoor recreation never really broadened as a landscape-level, integrative, systems-oriented field of study like other natural resource disciplines (see, for example, Hammit and Cole 1998, Manning 2010).

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Finally, paradigm shifts are inherently political, and require both societal demand and institutional recognition and support (Blyth 2013, Brown and Harris 1992). Many scientists and land managers recognize the need for change to reflect changes in society, and they are advancing some creative and innovative approaches to outdoor recreation planning and management, but these tend to be ad hoc efforts that have not yet become part of the dominant institutional paradigm. It is time to recognize and embrace the shifting outdoor recreation paradigm.

Current Outdoor Recreation Paradigm

Outdoor recreation is generally viewed as outdoor activities that occur during discretionary time, conducted primarily for one's intrinsic enjoyment (Driver and Tocher 1970). The role of the recreation resource manager is to provide opportunities to access high-quality settings and to manage visitor behavior and environmental impacts (Hammitt and Cole 1998, Moore and Driver 2005). This management paradigm emerged as part of the resource production era of the 1960s and 1970s (Brown and Harris 1992, Collins and Brown 2007). It replaced the original paradigm of encouraging touring and recreational access and use of public lands, laissez-faire

management practices, and little to no research. During this "custodial era" (1900–1950) of natural resource management in the United States, there was little active management, and lands were primarily set aside to protect them from highly exploitive uses such as poaching, overfishing, and destructive logging and grazing (fig. 1.1).

After World War II, recreational use of public lands grew exponentially. It was fueled by rapid economic growth and increased discretionary income and leisure time, the rise of the automobile and interstate highway system, new types of recreational equipment, urban and suburban population growth, standardized vacations, and other social dynamics (McLean et al. 2005, Rutkow 2012). Visitors sought outdoor areas to enjoy a variety of activities in natural settings. It came as a shock to land managers, who were accustomed to relatively few visitors who hunted, fished, and camped on public lands. Analysts called this the "recreation boom era." Visits to federal lands rose from 10 million in 1945 to 90 million in 1960, a ninefold increase, while the nation's population increased only 35 percent. Historian Eric Rutkow (2012: 293) referred to the recreation growth as "a horde of leisure-seeking locusts." There was also a dramatic increase in public support and

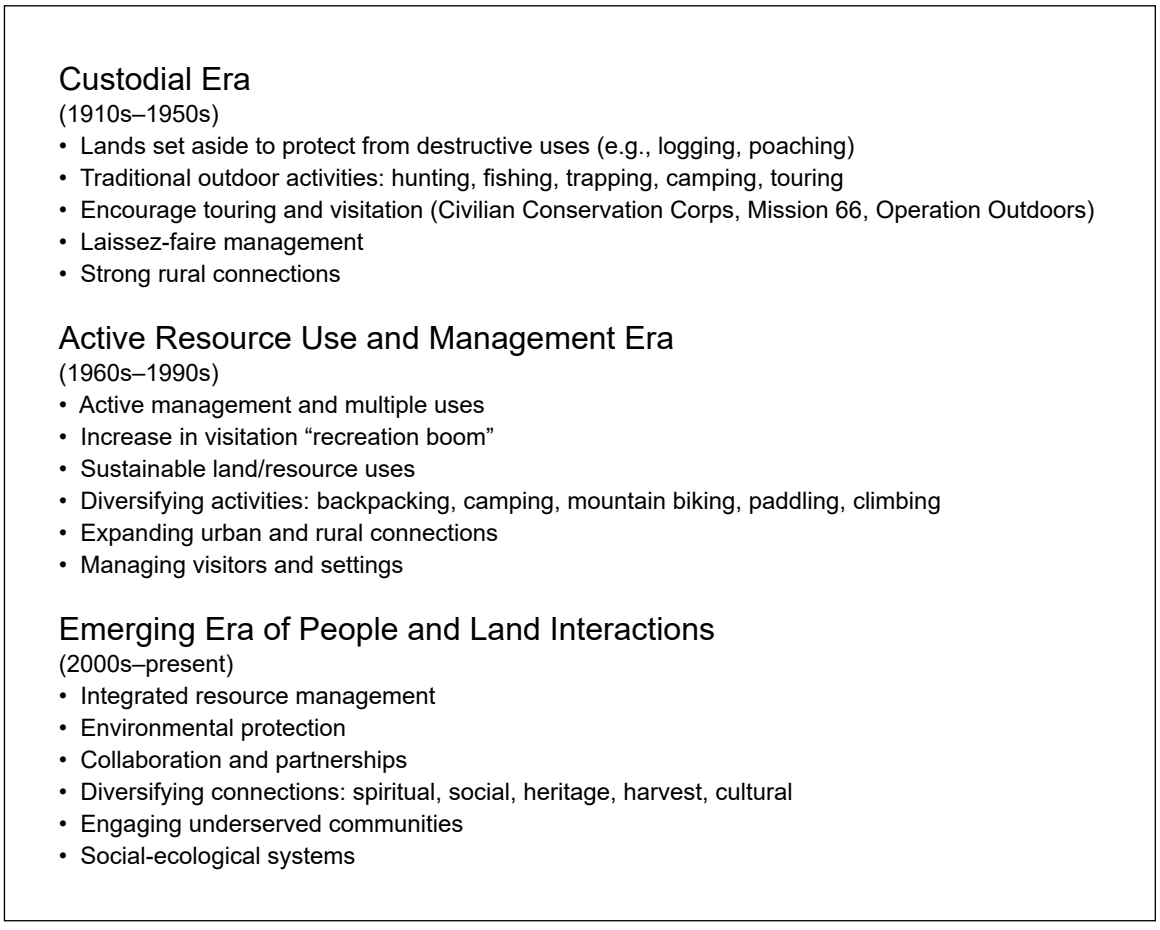

Figure 1.1—Key themes of resource management and outdoor recreation paradigms.

funding for recreation management as well as new laws to designate and protect areas for recreation such as the Wilderness Act, National Trails Act, and Wild and Scenic Rivers Act.

Although the number and interests of visitors increased dramatically, participants actually represented a very narrow slice of White, middle-class Americans whose recreational interests tended to focus on individual or small-group activities aimed at experiencing natural conditions and undeveloped, primitive landscapes. Agency goals that evolved as a result of the recreation "boom" focused on managing settings and visitor behavior and maintaining desired experiences, primarily focusing on traditional uses (e.g., fishing, hunting, camping) and emerging activities of the period (e.g., backpacking, river rafting, snowmobiling). Research supported by the agencies emphasized visitor use numbers, classifying types of recreation experiences, and managing for social acceptability and visitor satisfaction (Manning 2010). Applications of research led to management practices and tools addressing perceived threats of the recreation boom such as crowding perceptions, visitor conflicts, environmental impacts, visitor education, and changing visitor behavior (Cerveny et al. 2011).

Most practitioners in management and research still view outdoor recreation through the cultural lens of the 1970s when the underlying assumptions about the "proper' relationship between people and nature were that (1) increasing visitation is an outdoor recreation **problem**, (2) a nature experience requires seeing few other people, (3) human use is an ecological disturbance factor, and (4) legitimate recreation experiences revolve around a narrow range of outdoor activities. These assumptions manifest a deeper, increasingly problematic outlook on the role of humans as separate and not integrated in natural landscapes, and reinforce stereotypical beliefs such as that popular recreation areas are ecological "sacrifice zones," that increasing use levels results in "loving our lands to death," that an appropriate number of people can be identified for many sites via crowding perceptions, and that it is impossible to meet the "dual mandate"' to both encourage use **and** protect the environment.

Most practitioners in management and research still view recreation through the cultural lens of the 1970s when the assumptions were that (1) increasing visitation is a problem, (2) a nature experience requires seeing few other people, (3) human use is an ecological disturbance factor, and (4) legitimate recreation experiences revolve around a narrow range of activities.

Emerging Paradigm of Outdoor Recreation

Since the 1970s, there have been many social, cultural, and economic changes in the United States that influence leisure and outdoor preferences. Federal land visits tend to be shorter and closer to home, primarily to developed sites near major travel routes (White et al. 2016). Advances in digital technology, recreational equipment, and social media have influenced both recreation use patterns and research opportunities (Sachdeva 2019, Valenzuela 2019). Urbanization, ethnic diversity, and income disparities are all increasing in the United States, but this diversity is not reflected in public land visitation, which stubbornly remains predominantly White and middle

class (Flores et al. 2018, Sanchez et al. 2019, Selin 2018). Many rural communities are declining, and others are converting from resource-dependent economies to service-, and recreation-, and tourism-based economies. American Indian traditional uses and co-management rights have been supported by courts throughout the nation. Environmental and recreation nonprofit organizations and outdoor industry partners are successfully collaborating with managers in all land management agencies.

Agency leaders, conservancy groups, and commercial recreation providers identified initiatives to increase public access and visitor diversity, engage urban residents, work closely with tribes, and integrate management with local community and regional development.

Agency leaders, conservancy groups, and commercial recreation providers have acknowledged these cultural changes and identified initiatives to **increase** public access and visitor diversity, engage urban residents, work closely with tribes, and integrate management with local community and regional development (Collins and Brown 2007, Forestry Source 2018, Selin 2018). These initiatives are reflected in new agency goals for outdoor recreation such as the National Park Service's "A Call to Action" (USDI NPS 2013) and U.S. Forest Service's "Sustainable Recreation Framework" (USDA FS 2010), which include initiatives for "reconnecting Americans to the outdoors," taking "parks to the people," "all lands" approaches, and "shared stewardship." Virtually all federal and state land management agencies recognize the need to step up efforts to address social equity and environmental justice disparities, encourage citizen science, and use public lands to **proactively** address public health and well-being (Wolf et al. 2019). These initiatives, however, are based on an emerging set of underlying assumptions that are vastly different from those embedded in the previous five decades of research and management.

These initiatives are based on an emerging set of underlying assumptions that are vastly different from those embedded in the previous five decades of research and management.

The emerging paradigm of outdoor recreation recognizes that humans are part of natural systems and that connecting with natural settings provides a broad range of human values and benefits that are not otherwise available, affirming these values and benefits to be essential for human health and well-being (Williams 2017, Wilson 1993). As such, it is the responsibility of outdoor recreation professionals and agencies to increase public access and visitor diversity and expand the types of visitor experiences, opportunities, and benefits that people obtain from public lands, while simultaneously protecting the natural environment (Keough and Blahna 2006, USDA FS 2016). Thus, the paradigm shift that is occurring in outdoor recreation has both a societal/conceptual component and an agency/practice component, and both require integrating social and environmental factors.

The emerging paradigm recognizes a wider variety of human activities, connections, and subtle interactions with public lands than is traditionally recognized by outdoor recreation management and research (Blahna et al. 2020a). Sense of place, spiritual connections, historical and lifestyle traditions, existence values, and interactional relationships are not directly addressed in the current visitor opportunity-experience-satisfaction paradigm. The same is true for key **outcomes** of recreation

like rural community resilience, social equity, environmental justice, and human physical and mental health. The literature on these values is expanding dramatically but is not well integrated in current recreation management tools and practices.

Research is needed to help build bridges from the existing to the emerging paradigm. Some recreation planning tools developed in the 1970s and 1980s are outdated, rarely used, and have relatively little impact on agency decisionmaking (Cerveny et al. 2011, Stankey 1999). Emerging goals can be met only by using interdisciplinary, integrative, systems thinking and analytic approaches to outdoor recreation planning and management (Blahna et al. 2020b, McCool and Kline 2020). Given declining agency budgets and staff levels, improving recreation capacity, planning methods, and management efficiency are also critical research and policy goals (Cerveny et al. 2020, Selin et al. 2020). This effort goes beyond appropriated funding, however, and calls for placing greater emphasis on shared stewardship approaches like collaborative management, partnerships, and co-management with tribes and private conservancy organizations. Essentially, it is to evaluate concepts and practices of social-ecological systems and sustainability sciences and apply them to outdoor recreation management on public lands (Berkes et al. 2003, Sayer and Campbell 2004).

Challenges for Paradigm Shift

The biggest challenge to shifting the outdoor recreation paradigm will be individual and organizational resistance to major change.

The biggest challenge to shifting the outdoor recreation paradigm will be individual and organizational resistance to major change (Brown and Harris 1992, Selin 2018, Selin et al. 2020, Wilson 1989). The tendency will be to tweak current practices a bit in an effort to address anomalies, without recognizing the fundamental nature of the changes needed in underlying assumptions and practices. In fact, land management agencies have been trying this approach for decades in efforts to increase the diversity of visitors to, and support for, public lands—but to no avail (Collins and Brown 2007, Flores et al. 2018, Sanchez et al. 2020). Currently, the most obvious barriers to expanding recreation's role in public land management appear to be declining fiscal resources and agency capacity. But it is too simple and probably erroneous to say that added capacity is "the answer." In fact, it could be argued that dedicating additional funding before explicitly identifying and evaluating new assumptions could actually perpetuate an outdated system.

Beliefs underlying previous paradigms are strongly held, and there is significant discomfort and resistance to organizational culture change (Margolis 1993, Wilson 1989). Shifting paradigms is difficult for many practitioners and scientists when they are deeply invested in the current paradigm and view the new thinking as a personal attack on their work, beliefs, and even material well-being (e.g., research

Organizational cultural change is essential for paradigm shift.

grants, agency funding lines, power structures). It is easier to do things the way they have always been done. Organizational structures can act to reinforce and even reify current paradigms, even if existing assumptions and practices provide only modest insights and practical value (Wilson 1989). In both the fire and wildlife examples above, agencies were slow to adopt the shifting paradigm. Even today there is residual resistance to some policies and practices (e.g., "prescribed natural fire" and "management indicator species" in the Endangered Species Act), but existing differences are about details of policies and practices, not about the general paradigm of integrated systems. Organizational cultural change is essential for paradigm shift.

The reticence to change is understandable but unfortunate. Shifting paradigms does not mean that all previous scientific work or management practices are incorrect and need to be replaced. Rather, paradigm shift can spawn creative new research questions and innovative policies and planning and management tools and, essentially, reinvigorate fields of study and practice (Kuhn 1970, Margolis 1993). The logic of paradigm shift is most easily seen after the fact; a generation after paradigm shift, the new assumptions and paradigm become the standard, and the need to shift the previous paradigm painfully obvious.

Another challenge is that, at this point, we cannot describe details of the new paradigm explicitly. Saying that outdoor recreation is essential to human well-being, and that public land agencies have the responsibility to treat expanding access and use as a primary goal in policy, planning, and decisionmaking, is easy to understand in the abstract, but very complex in practice. Blyth (2013) has pointed out that paradigm shifts in the social and policy realms can be more difficult than in natural sciences because desired goals and outcomes upon which "truth" is based is a matter of contention among all people "allowed to participate in the discourse" (Walker 2015). As for the scientific basis of the shift, E.O. Wilson (1999) argued that the research methods and explanation for social science phenomena are more difficult and complex than for physical and biological phenomena. Addressing this challenge will require a more equitable balance between the social and natural sciences than currently exists in land management agencies and university environmental programs (Blahna and Kruger 2007, Jacobson and Duff 1998).

The final challenge for shifting the outdoor recreation paradigm is that paradigms are mental constructions and, like ecological phenomena, are part of a nested hierarchy of lower and higher levels of understanding. Wildlife ecology and fire ecology both emerged after Tansley's refutation of Clement's long-held paradigm of the role of individual species in plant community succession to one of system dynamics reflected in the new ecosystem paradigm in ecology (Keller and Golley

2000). The new recreation paradigm, with its greater emphasis on system dynamics and thinking (McCool and Kline 2020), is a similar shift, but in a more dominantly social system. But if ecology is to include humans as more than disturbance factors in ecosystems, that shift is not only logical, it is necessary. Furthermore, Clement's notion of competition and succession had roots in Platonic metaphysics. Does that mean we need to go back to ancient Greek and Eastern science philosophies to create paradigm shift? Of course not, but it does mean that we need to bound our niche in the broader social-ecological system and address the gathering storm of anomalies. Continuing the status quo would be a disservice to current and potential public land visitors everywhere.

Conclusions

Dated recreation planning tools, a downward trajectory for appropriated government funding, and shifting societal values and growing diversity all lend urgency to the need for new ways of thinking about our profession and new practices in recreation management. Outdoor recreation is still viewed as a secondary consideration in decisionmaking by federal land management agencies, with resource production and environmental protection values dominant (Selin 2017, 2018). Ironically, recreation access and use are the primary ways that Americans connect with public lands, and public lands could be viewed as an essential component of the nation's health infrastructure. We need to act now for three reasons: (1) natural systems will benefit from a better relationship with human society, (2) there is an immediate need for increased government support for recreation management and infrastructure, and (3) public lands require consistent and more public support if they are to continue to exist as a valued component of our well-being.

Outdoor recreation is still viewed as a secondary consideration in decisionmaking by federal land management agencies.

Why do we assert that these cultural shifts, agency initiatives, and visitation patterns require a paradigm shift? The anomalies and emerging agency initiatives are the **converse** of the assumptions underlying the current paradigm. Although solitude, remoteness, traditional uses, counting visitors, and reducing onsite conflicts will always be important parts of public lands recreation management, they are not and should not be the primary focus of the new and emerging goals of sustainable recreation. Recognizing different cultural beliefs and expectations regarding human-nature interactions, expanding understanding and measurement of the diversity of benefits of human-nature contacts, and creating an outdoor recreation ecosystem science will require significant changes for both recreation research and agency management, not unlike the scientific revolutions in fire and wildlife ecology in the 20th century. The chapters in this report suggest some pathways forward for public land management agencies.

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Chapter 2: Agency Capacity for Effective Outdoor Recreation and Tourism Management

Lee K. Cerveny, Steven Selin, Dale J. Blahna, Noelle Meier, James R. Barborak, and Stephen F. McCool[1]

> In any bureaucracy, there's a natural tendency to let the system become an excuse for inaction.
>
> —Chris Fussell (2016)

Purpose

This chapter explores concepts in agency capacity and discusses how changes in an organization's capacity to plan and manage outdoor recreation can shape or limit its ability to provide quality outdoor recreation experiences. We use a case study from the U.S. Forest Service to convey how shifts in financial, human, information, and material resources can challenge an agency's ability to achieve its mission. We present recent models of agency capacity and its effect on organizational performance and explore notions of adaptive capacity and capacity-building to present ideas about how agencies can quickly reallocate resources and strategically focus on initiatives with high impact and maximum efficiency, while also promoting equity in access as well as economic, social, and environmental sustainability.

Problem Statement

There is growing recognition of the value of outdoor experiences and nature connections for human health and well-being. In coming years, protected areas such as national parks, forests, monuments, and refuges, as well as state parks and forest lands, will experience increased demand by visitors because of population growth (particularly in urban areas), improvements in transportation networks, greater affordability of travel, and the easing of travel barriers in nations like China. Meanwhile, many public land management agencies and their partners face budgetary constraints and limited staffing, which can make it difficult to (1) provide adequate resources to keep up with the maintenance and improvement of recreation

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Although the value of outdoor recreation on public lands is increasingly being recognized, this has not yet translated into increased agency support for providing quality outdoor experiences.

facilities and infrastructure; (2) provide quality interpretation programs for visitors; (3) hire, train, and retain enough skilled workers with backgrounds in recreation; and (4) equip that workforce with science-based decision tools for the planning and management of recreation and tourism. Although the value of outdoor recreation on public lands is increasingly being recognized, this has not yet translated into increased agency support for providing quality outdoor experiences. In the United States, these challenges of increasing visitation and declining capacity have been observed at the state level as well (Smith et al. 2019). Despite these challenges, public agencies can expand their adaptive capacity to increase organizational performance. By reaching out to agency partners and exploring ways to leverage resources and work collectively to achieve common goals, many of these demands can be met. Capacity-building strategies can be employed to focus agency efforts on critical programs, settings, and services and to build resources from the top down and the ground up (Crisp et al. 2000).

Dimension of the Problem: Elements of Agency Capacity

Capacity exists at three levels: societal, organizational, and individual (Bolger 2000). Understanding factors that influence performance at the three levels is important for recognizing an agency's ability to provide quality outdoor experiences and nature connections for visitors to public lands and protected areas managed by all levels of government. Although our focus is on organizational capacity, these other types of capacity influence how we organize our thinking around our ability to achieve goals to expand outdoor recreation opportunities and promote sustainable recreation and tourism.

Societal Capacity

Capacity can be discussed in terms of social values, socioeconomic well-being, politics, and technology. In relation to public lands management, we might consider how a society values nature, wilderness, and natural resources. Additionally, we may ask what value people place on the need to spend time outdoors and connect with nature. What do we believe about the importance of recreation to human health and well-being? Moreover, a society's level of support for outdoor recreation is also a function of its economy. If an economy is strong, there will likely be greater consumer spending on outdoor recreation gear and travel to public lands both near and far. If an economy is weak, fewer people will have the resources or time to travel to public lands for relaxation, adventure, learning experiences, or exercise. Economic decline and stagnation may also be associated with crime and reduced safety, which may affect recreation participation. Finally, politics can play a role in terms of government legislative and executive branch support for public lands and their many benefits.

Organizational Capacity

Organizational capacity is shaped by budgetary resources, facilities, human resources, information resources, and leadership (fig. 2.1). An organization's capacity is its institutional potential to perform—to successfully apply skills, resources, and effective management toward accomplishing its goals and satisfying public expectations. This capacity is expressed in terms of resources (e.g., personnel, physical, and material resources; finances; and information) and a focus on learning and adaptation. It also is expressed in terms of management (e.g., strategic leadership, program and process management, networking and linkages) (Bolger 2000, Lusthaus et al. 2002). Organizational capacity also can be constrained by the language we use and conceptual frameworks that become institutionalized in our creation of programs and budget line items (Armstrong and Derrien 2020). As noted by Blahna et al. (2020a), agencies establish programmatic areas around functional operations that can become highly restrictive. These agency "silos" and standard operating procedures may constrain how resources and opportunities are managed.

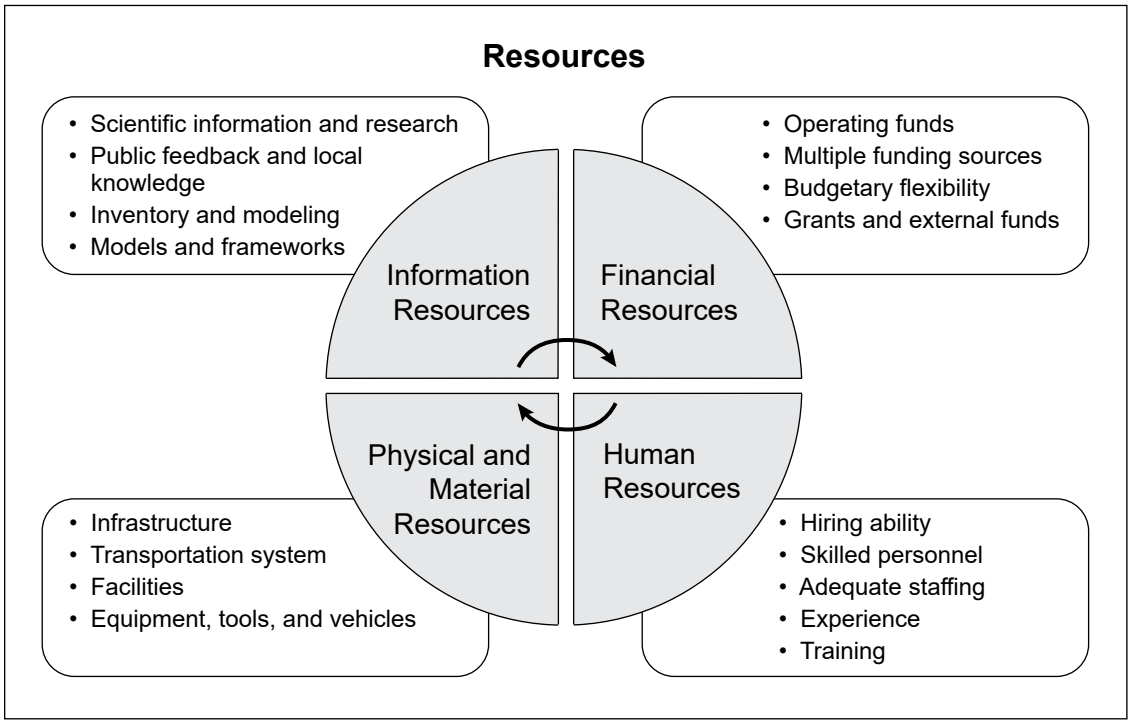

Figure 2.1—Model of resources for organizational capacity. Adapted from Lusthaus et al. (1995).

Individual Capacity

Individual capacity refers to one's access to resources, personal leadership, social capital, and ability to wield influence over an outcome. Are individuals empowered to act in ways that support their personal or organizational goals? Do job descriptions define core competencies needed for each position (Appleton 2016)? To what extent do individuals have the freedom to make decisions or choices and to think creatively? To what extent do individuals exercise "agency" (or the ability and inclination to act independently and serve as change agents to get something done) in their respective positions (Giddens 1984)? Individual capacity may be enhanced or expanded in organizations and societies in which individuals have a sense of autonomy and creativity, where their views are heard and respected, where it is believed that one small human act can lead to change, and where there is relative equity in access to knowledge (e.g., libraries and the Internet). Where information is controlled, hoarded, or unevenly distributed, where there is an overall perception that individual actions are not going to make a difference, or where there is little access to information or training opportunities, individual capacity is low (Bourdieu 1977). Within an organization, individuals can possess varying degrees of capacity. In some cases, individuals are encouraged to think independently, be creative, seek resources, take risks, learn not just from success but from failure, and have the discretion to develop innovative solutions. In other situations, this type of innovation, creativity, and risk-taking is discouraged and the decision space is narrow (Lipsky 2010).

An organization's capacity is dependent on access to and control of financial resources, human resources, physical and material resources, and information resources as well as management effectiveness.

Elements of Organizational Capacity

An organization's capacity is dependent on access to and control of financial resources, human resources, physical and material resources, and information resources as well as management effectiveness (Lusthaus et al. 1995) (fig. 2.1).

Financial Resources

The availability of an adequate and stable budget plays a crucial role in organizational capacity. Organizational performance depends on the level, stability, and flexibility of financial or budgetary resources. Are operating budgets keeping up with inflation or addressing the challenges of increased demand? Are they adequate to address the maintenance and management of existing resources used by the public? Can the institution generate direct revenues from the public it serves through user fees, taxes, and other means? Does the agency have the ability and will to be flexible, shifting resources quickly to address needs in response to changes on the ground? How well can the agency leverage additional resources through critical partnerships, grants, and agreements?

Human Resources

To maximize public service, organizations depend on having enough trained and skilled staff who are assigned to the right tasks and can build on their individual and collective strengths. Does the organization have enough employees to achieve the recreation mission? Are recreation employees able to respond to public needs? Does the organization have the ability (authorities, funds, and mechanisms) to recruit appropriate employees? Does the organization have the funds to train new and existing employees in the latest practices of recreation management? Are the right people with the right skill sets working in recreation positions? Can the organization use partnerships or agreements with other government agencies or nongovernmental entities and volunteer programs to augment personnel levels to achieve mission results? Are recruitment, retention, promotion, and training tied to critical competencies, job skills, and abilities?

Physical and Material Resources

Facilities and equipment allow services to be provided and work to be completed. Is the agency able to provide high-quality facilities, utilities, infrastructure (e.g., buildings, equipment, displays, and signage), and transportation systems to serve the public need for recreation? What is the status of existing facilities that serve the public, such as trails, restrooms, picnic shelters, boat ramps, and campgrounds? Are there enough to meet public demand? Are new facilities needed to account for increased or shifting public demands and future use? Are existing facilities of sufficient quality to keep people safe? Are adequate resources devoted to periodic maintenance and is depreciation of assets budgeted for? Are there protocols and contingencies to deal with natural disasters and other risks and emergencies?

Information Resources

Organizational capacity must be considered in terms of the accessibility and use of the best available science and information. What is the status of the organization in terms of its ability to provide access to up-to-date information, science, and technology to support recreation management? This can include many sources from simple visitor counts and feedback to data-based models of visitor behavior and management implications. What is the support for foundational and applied research and tool development for outdoor recreation? Are there technology transfer (science delivery) components built into existing agency structures? Are there adequate vehicles and protocols for sharing of best practices? How is agency leadership investing in new science that meet changing public needs? Are there adequate partnerships in place among government agencies, with universities and

research entities, and with nongovernmental organizations to generate and apply new information? Does the agency recognize and incorporate multiple sources of information (local knowledge, traditional ecological knowledge, professional expertise, scientific information) to inform decisions?

Management

Effective management is critical to an organization's capacity (fig. 2.2). Leadership includes the ability to evaluate the significance of external events to make strategic decisions. Leadership also is required to examine internal operations and make decisions about how to shift priorities and service areas. Effective leaders establish clear goals and motivate employees to achieve those goals. To what extent are organization leaders clear about the mission? How is support for that mission being expressed and reinforced? What are the goals and targets that are being used to measure accomplishment? Does the organization identify core strengths of staff members and teams and build on them through strengths-based leadership?

Ability to focus on learning in a complex, resource-constrained environment is also a significant component of capacity.

Ability to focus on learning in a complex, resource-constrained environment is also a significant component of capacity. Along with complexity comes increased

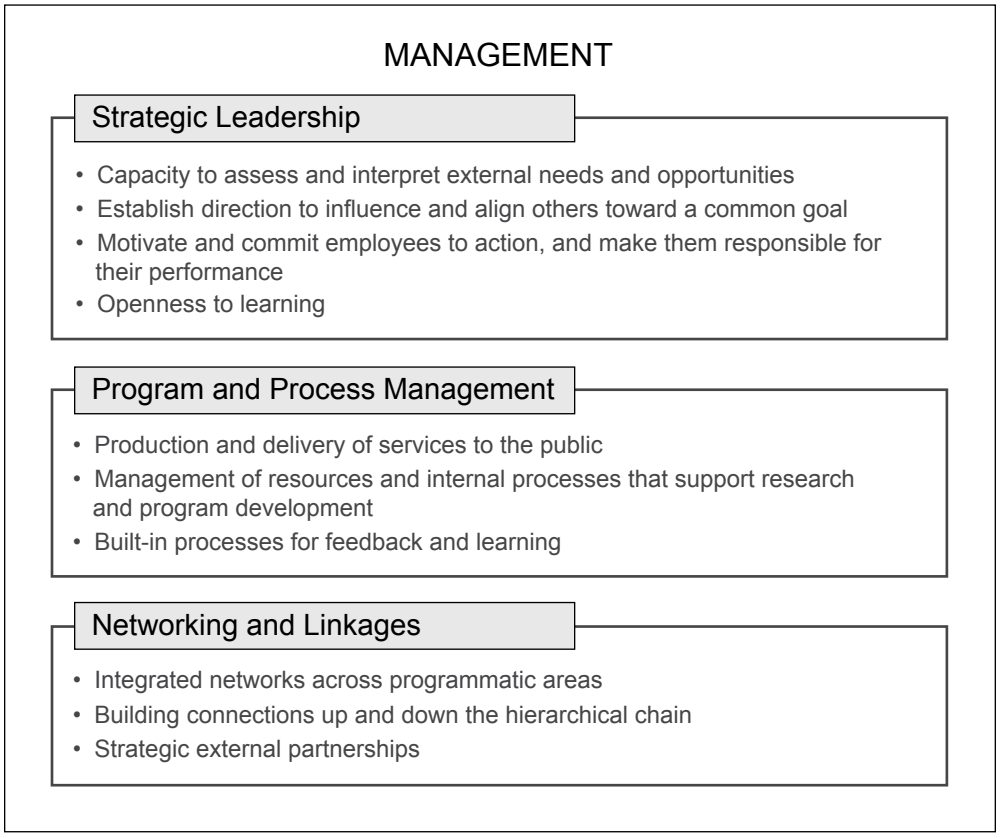

Figure 2.2—Types of management. Adapted from Lusthaus et al. (1995).

uncertainty. This uncertainty means that organizations must emphasize learning and tolerance for errors, and must encourage adaptive management. Creating an organizational culture that is open to learning comes from leadership and can be reaffirmed by establishing processes that encourage feedback and highlight learning. In 21st-century settings, not only are resources to manage limited, but the complexity of jobs has increased dramatically.

Also important to management are the establishment of critical linkages across programmatic areas within the organization, opportunities for establishing connections at different hierarchical levels, and partnerships with external organizations to achieve common goals and leverage existing resources.

Case Study in Organizational Capacity: Recreation in the U.S. Forest Service

To illustrate some of the dimensions of capacity in the context of outdoor recreation, we now focus on one agency, the U.S. Forest Service. Although the Forest Service is not representative of all public land recreation management agencies, it also is not atypical. This section combines budgetary and personnel data with observations from recreational professionals employed by the agency. The challenges faced are expressed from the perspective of a recreational professional actively engaged in providing programs and services while facing changes in organizational capacity.

Recreation in the Forest Service at the national level is managed within a broader program called "Recreation, Heritage, and Wilderness Resources." Access to national forest lands is important to the quality of life, health, and well-being of local residents and visitors and is associated with significant economic impacts. In 2016, national forests and grasslands attracted 148 million visits, generating an estimated $10 billion to the U.S. economy (USDA FS 2016, White et al. 2016). Despite the economic and societal benefits of outdoor recreation, public agencies often face conceptual blinders that make it difficult to recognize the value of outdoor recreation to the American people relative to other ecosystem functions, as noted in chapter 1 of this report (Blahna et al. 2020b). In the Forest Service, public use of national forests for outdoor recreation was historically treated as a secondary forest use behind timber, water, minerals, and other resources. Over the past 30 years, recreation has been outpaced in funding and attention by wildlife, ecological restoration, and fire. Leaders recognize that recreation is the primary means by which Americans connect with their national forests, yet the agency processes and programs have not been reworked to acknowledge the prominence of recreation as a programmatic area.

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Financial resources—
Since 2005, the Forest Service has faced a steady decline in real dollars for appropriations in Recreation, Heritage, and Wilderness budget lines (fig. 2.3). Meanwhile, costs of operations, administration, analysis, and litigation have increased over time with inflation. Decreasing allocations have been accompanied by other restructuring at the national and regional levels, in which the Forest Service has centralized several administrative functions away from field offices. Some of those responsibilities have shifted to local managers and field personnel. This is known as "burden shift" (Kashdan 2009, Marsh 2018, U.S. GAO 2011).

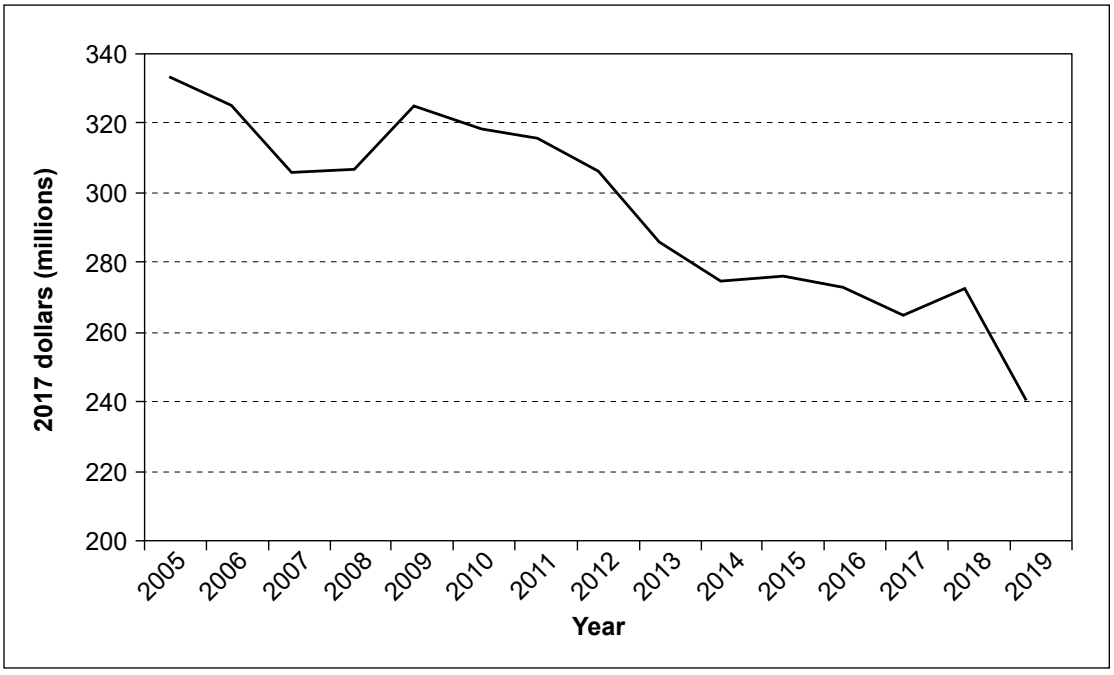

Figure 2.3—U.S. Forest Service annual appropriations of recreation, wilderness and heritage programs from 2005 to 2019 (president's budget), adjusted for inflation. Source: U.S. Forest Service budget justification reports: 2006–2019.

Human resources—
Declining financial capacity has implications for workforce, public engagement, and hiring. Since 2005, full-time equivalent positions in the Recreation, Heritage, and Wilderness Resources program also have declined by more than 1,100 positions based on 2019 estimates (fig. 2.4). Many vacated recreation positions have gone unfilled, contributing to the need to spread recreation personnel across multiple districts and forests. Fewer permanent staff are available to accomplish existing work, especially considering "burden-shift" from increasing administrative duties, staff

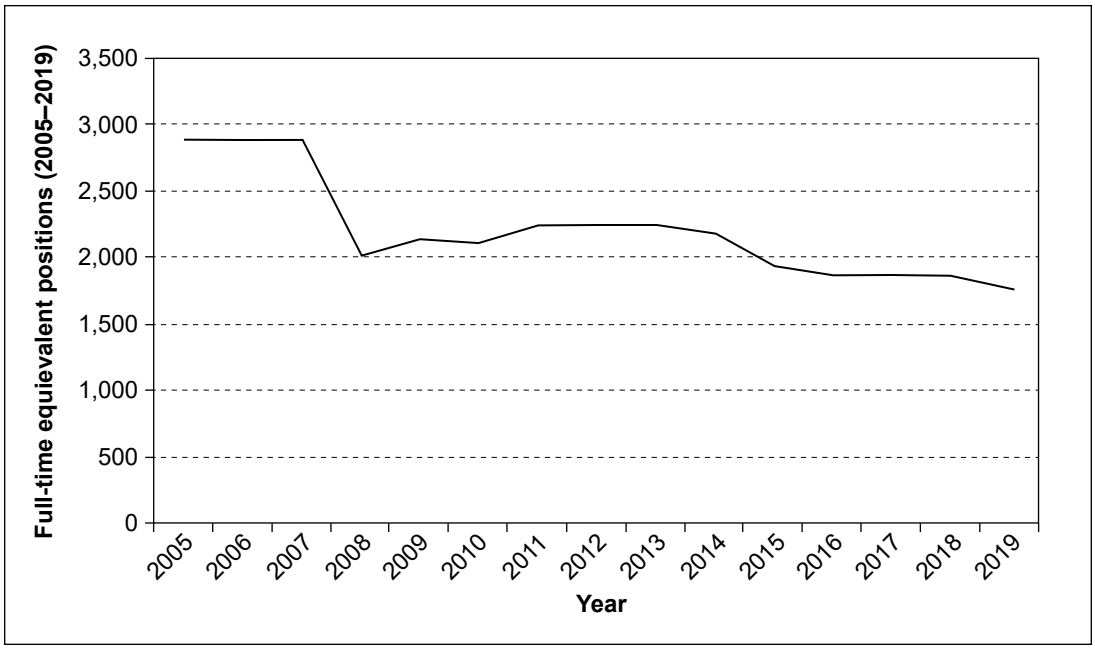

Figure 2.4—U.S. Forest Service personnel in recreation from 2005 to 2019 (projected). Source: U.S. Forest Service budget justification reports: 2006–2019.

being responsible for larger geographic scales (e.g., zone personnel responsible for multiple forests or even a whole region, rather than a specific forest or ranger district), and increased employee supervision. Permanent hiring, especially on short notice, can be difficult. Sometimes applicants qualified by human resources personnel as appropriate for a job series may lack education, training, or experience in recreation management principles and planning frameworks, or they may lack familiarity with recreation research. Moreover, vacant recreation positions are not always ranked as a priority hiring need for forests, falling behind timber, fisheries, and wildlife management positions. Finally, the Forest Service adopted a framework for sustainable recreation in 2012. Measures for sustainable recreation and tourism have been developed by the International Union for Conservation of Nature and are being adopted globally (Leung et al. 2018). Training of recreation planners in the use of these sustainable recreation approaches would be important to implement agency goals.

Physical resources—
The Forest Service has faced steady declines in maintenance and capital improvements funding since 2005, losing an average of 5 percent annually, with greater losses in facilities, which declined an average of 8 percent annually (fig. 2.5). Declining budgets for facilities, roads, and trails creates pressure for the agency, which has seen a steady increase of annual visitors. At the close of fiscal year 2016, the Forest Service reported a $5.5 billion maintenance backlog, including

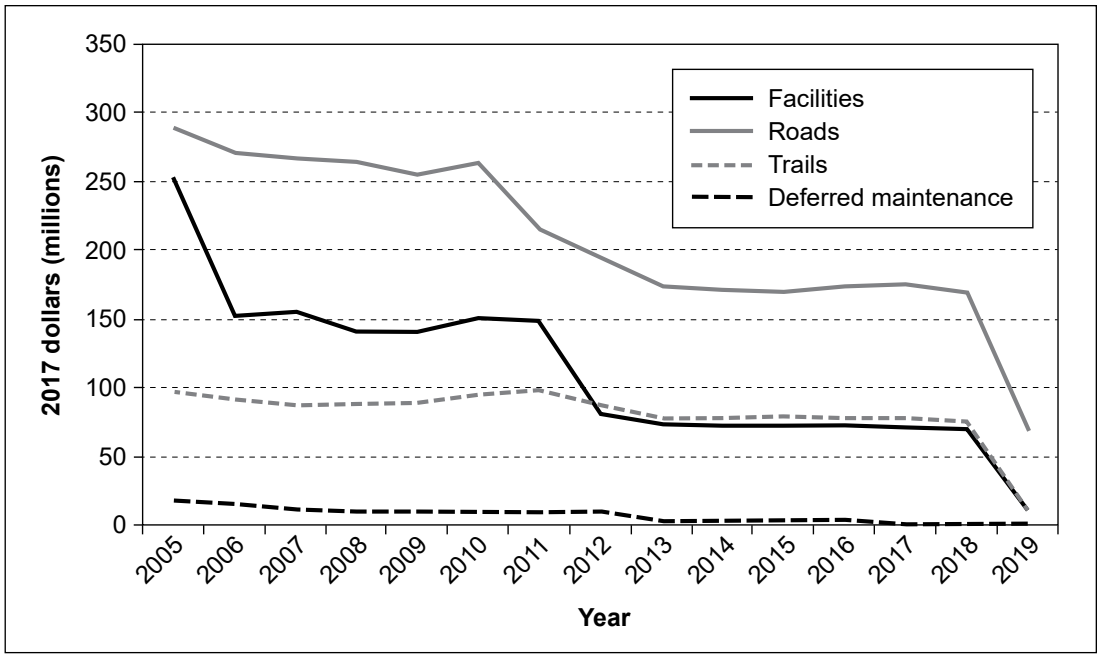

Figure 2.5—U.S. Forest Service annual appropriations for capital improvement and maintenance from 2005 to 2019 (president's budget) adjusted for inflation. Source: U.S. Forest Service budget justification reports: 2006–2019.

deferred maintenance for roads, trails, buildings, water systems, and fences, among other categories (Vincent 2017). With visitation predicted to grow in coming years (White et al. 2016), questions are raised about how maintenance needs can keep up with growing visitor use, particularly to day-use areas. Research has demonstrated that provision of outdoor recreation facilities, such as campgrounds, picnic areas, and boat ramps, is associated with higher visitation to public lands, which could generate agency revenues from user fees (Donovan et al. 2016).

Information resources—

The Forest Service prides itself on science-based management, yet there are constraints to the use and implementation of the best available science in the management of outdoor recreation (Cerveny and Ryan 2008). Some of these might be (1) lack of science delivery specialists to translate foundational science or basic research into applications or tools for use by management; (2) lack of time, personnel, or people with the appropriate recreation background to fully immerse in the latest recreation research and adapt science findings to local conditions; (3) cultural differences between research and management that make it hard for scientists to convey findings in a way that meets planning requirements and hard for managers to interpret and implement scientific results (van Wyk et al. 2008). Scientific capacity overall has declined by 500 positions since 2005, based on agency budget reports.

Recreation science in particular has quieted in recent years with the retirement of several key individuals who started their careers in the 1970s and 1980s. A steady stream of social science and recreation ecology research can help natural resource agencies develop tools and frameworks for decision support.

Public service—
Because fewer employees are engaged in more work, less time is available to interact with the public on the ground, at meetings, or in collaborative situations. As Haque (2001) noted, when the amount of available staff declines, customer service can be adversely affected. When making choices about how to allocate time, customer service may be treated as less critical than meeting internal deadlines. On the other hand, the administrative and analysis deadlines may slip because of long days dealing with pressing issues on the ground.

Linkages—
The Forest Service makes greater use of volunteers and partners than ever before, often thousands of person-hours of their time per year, per unit. Volunteers and partners provide a tremendous service and amount of labor, filling gaps and creating a vital role in citizen participation in the management of our public lands. Partners have expressed some concerns about being over-tapped and needing greater involvement and oversight from agency staff (Seekamp and Cerveny 2010). These concerns about overburdening volunteers and partner organizations are being considered by public land managers eager to protect these relationships.

This section has illustrated challenges faced by agencies as they seek to achieve their mission, in this case providing opportunities for the public to use national forests for a variety of outdoor activities. The Forest Service is facing declining budgets, personnel, and an increase in maintenance needs along with steady or increased visitation. Partnerships with local and national organizations have increased the role of volunteers and external funding sources and have cultivated an approach to shared stewardship. Our models of organizational capacity suggest that leadership that provides a clear vision, identifies strategic focus areas, establishes effective processes, generates new knowledge, expands linkages and partnerships, and provides opportunities for organizational learning can adapt to these changes.

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New Approaches: Adaptive Capacity and Capacity Building

Adaptive capacity—
Organizations that can adapt quickly to changes in societal values and available resources are said to have adaptive capacity (Staber and Sydow 2002). Organizations with capable leadership that can identify and respond quickly

to trends will be able to continue to have high performance. Responses can be made by refocusing the mission, adjusting goals or targets, retraining or hiring new personnel, or developing strategic partnerships. In the case of public land management agencies, this would mean responding to declines in financial, personnel, facilities, and information by reallocating resources, retraining employees, and reaching out to partners with mutual goals to leverage resources. It may require being strategic and focusing on high-priority and high-impact activities, while letting others go. It also suggests the need for proactive, strategic thinking and making difficult choices in response to budgetary and personnel constraints. In many cases, this may mean actually recognizing the need for "doing less with less" rather than "doing more with less." Adaptive capacity requires nimble leadership and an agency culture that is not averse to change, flexibility, or employee willingness to restructure to meet new demands. Without adaptive capacity, agencies faced with dwindling resources may suffer declines in staff, deteriorating facilities, and loss of focus while trying to do more with less, leading to low morale and gradual loss of public support. Adaptive capacity also suggests a proactive mindset, which identifies challenges, seeks information, and works with research to test and develop innovative tools, rather than a reactive mindset, which responds to problems as they arise. Sustainable resource management is essentially forward looking; it requires anticipating future needs and problems and having flexible and innovative metrics and tools to adapt to those pressures sustainably. Thus, agency adaptive capacity is both a cause and a result of proactive thinking and management, and, as such, it may be the first and most important step in attaining the larger paradigm shift that is needed to address sustainable outdoor recreation management in the 21st century.

Adaptive capacity requires nimble leadership and an agency culture that is not averse to change, flexibility, or employee willingness to restructure to meet new demands.

Features of Organizations With High Adaptive Capacity

- Ability to refocus mission and establish new targets and goals to meet new reality
- Strategic investment in high-impact activities
- Budgetary flexibility to shift allocation
- Ability to hire, reassign, and retrain employees quickly
- Steady investment in research and development
- Open access to information
- Encourage creativity and innovation
- Encourage partnerships and alternative ways to leverage resources
- Encourage bottom-up solutions

Capacity building—
New approaches are being explored to focus on building organizational capacity for recreation and tourism. Crisp et al. (2000) identified four approaches for capacity building: a **top-down organizational approach** that begins with changing agency policies or practices; a **bottom-up organizational approach**, which provides new skills to existing staff; a **partnerships approach**, which strengthens relationships among diverse organizations; and a **community organizing approach** where community members form new organizations or join existing ones to focus on a common goal.

The past few years provide several examples of approaches implemented in the context of outdoor recreation management.

Top-down—For example, a top-down approach in the Forest Service resulted in the establishment of a National Partnership Office, which offered material and training related to partnership development for public land management agencies. The Forest Service also hired a cadre of partnership coordinators throughout the agency at various levels, which strengthened the agency's capacity to leverage resources and add human resource capacity (Seekamp and Cerveny 2010).

Bottom-up—An example of bottom-up approaches might be the development of recreation short courses by universities to help train public land managers in skills related to recreation planning and management. One project focuses on empowering middle managers to have enhanced individual capacity, emphasizing learning and developing critical leadership competencies, such as planning and strategic thinking (McCool et al. 2012).

Partnerships—The partnership approach model was exemplified by the Forest Service, which made a concerted effort to hire partnership coordinators at the forest level, which strengthened the agency's capacity to work with partners on outdoor recreation. The agency also emphasized partnerships as a component of performance evaluations for a wide range of employees.

Community organizing—Community-based approaches to outdoor recreation management have emerged in recent years. For example, in Darrington, Washington, a group of local tourism providers and community leaders formed a collaborative group to focus on outdoor recreation, public access, and roads on the Okanogan-Wenatchee National Forest. The Forest Service has implemented formal collaborative efforts for other resource management programs, such as restoration, but no such program exists that focuses on recreation or tourism management.

Further exploration of these capacity-building efforts in the context of outdoor recreation and tourism would help identify exemplary cases and best practices for sharing.

Compelling Questions

The organizational capacity literature suggests several compelling questions to be explored further to advance our thinking about agency capacity related to outdoor recreation and tourism:

1. To what extent are public lands agency leaders clear about the mission regarding outdoor recreation and tourism? How is support for that mission being expressed and supported?
2. What are the goals and targets that are being used to measure accomplishment? How are outdoor recreation programs and services being delivered? How can existing capacity be expanded to improve delivery of critical programs and services?
3. What is our collective capacity to provide innovative science and creative solutions to address resource needs? How might universities and public agencies work together to direct the development of science-based tools and frameworks to inform planning and decisionmaking? To what extent do resources exist to support research and development related to sustainable recreation?
4. What networks, partnerships, and linkages exist among public agencies, industries, partners, and stakeholders to support the provision of recreation on public lands?
5. Can we design and implement alternative capacity-building models to strengthen the efficacy of the managed recreation program? What is leadership's role in capacity-building efforts and what is the role of community partners?

Conclusions

This chapter presents some preliminary ideas related to our organizational capacity for providing outdoor recreation and tourism and presents some frameworks and concepts to aid in how we think about the role of institutions. More information and deliberation are needed to flesh out these ideas and to think about approaches to organizational capacity building that make sense for different types of protected area management institutions, including federal bureaus and state and local government agencies, as well as their academic, nonprofit, and industry partners.

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Chapter 3: Recreation Opportunities and Human Connections on Public Lands: Constraints That Limit Recreation Participation

José J. Sánchez, Lee K. Cerveny, Dale J. Blahna, Francisco Valenzuela, and Mike Schlafmann

> The way we think and talk about relevancy now includes thinking about how we can be more relevant to new audiences in underserved populations—and, frankly, in the changing demographics of the entire country. So it's not just geographic, it's much larger than that. A major component of that is also internal. As an agency we ourselves need greater diversity of voices, backgrounds, and experiences.
>
> —Jonathan Meade, National Park Service Northwest Region deputy director (Dennehy 2016)

Purpose

This chapter will investigate who are the visitors and nonusers of outdoor recreation opportunities, and what factors influence or inhibit forest visitation. Additionally, it will focus on identifying a research agenda that links the cultural ecosystem services of outdoor recreation with issues of diversity and cultural and social constructs in the actual delivery and use of this public service, and develop management strategies to better increase visitation rates on nonusers.

Problem Statement

Ecosystem services are benefits that a landscape provides in terms of human values or outcomes (see Blahna et al. 2019 for additional information). Outdoor recreation is one of the most widely recognized ecosystem services provided by national forests, grasslands, parks, refuges, and other public lands. In 2016, the Outdoor Industry Association reported that almost half (49 percent) of Americans participated in at least one outdoor activity, which equates to 144 million outdoor participants (Outdoor Industry Association 2017). Their study also reports that 73 percent of participants were White; however; this group accounts for only 61

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percent of the U.S. population (USDC CB 2018). Traditionally underrepresented groups, particularly Hispanic and African-American segments of the population, do not participate in recreation activities on public lands at the same rate as non-Hispanic White population groups (Crano et al. 2008, Outdoor Industry Association 2013, Tierney et al. 1998). Previous research has focused on barriers to outdoor recreation for underrepresented groups (Crano et al. 2008, Roberts and Chitewere 2011, Schwartz and Corkery 2011). Some of these findings cite a lack of access to public or private transportation, insufficient financial resources, or lack of outdoor experience as primary reasons for not visiting the outdoors. Furthermore, other studies have found outdoor participation barriers for minorities to include perceived or real discrimination (Blahna and Black 1993, Byrne 2012, Chavez 1993, Roberts and Chitewere 2011); personal safety (Byrne 2012, Johnson et al. 2001); and having less attachment to outdoor recreation areas (Johnson 1998).

Social equity is directly related to the democratic principle of justice (Gooden 2014). In sustainability science, intergenerational equity, issues of social exclusion, and the need to reconcile social justice with environmental sustainability are important issues that must be addressed to achieve social resiliency (Gibson et al. 2005, Martin 2017, Rogers et al. 2008, Thomas 2013). Federal, state, and local land management agencies need to understand and identify how to better serve a more diverse U.S. population.

Dimensions of the Problem

By 2044, the United States is expected to become a majority-minority country, with less than half the population then being classified as non-Hispanic White (Colby and Ortman 2014). As the U.S. population becomes more diverse, public land management agencies need to consider different management strategies to increase participation in outdoor recreation for nontraditional users. The Outdoor Industry Association (2017) identified the most popular U.S. outdoor recreational activities as (1) running (18 percent); (2) fishing (16 percent); (3) cycling (15 percent); (4) hiking (14 percent); and (5) camping (14 percent). However, these popular outdoor recreation activities and leisure patterns can potentially change because diverse racial and cultural groups may have different outdoor recreation preferences, pathways, social trends, and traditions of connecting to the outdoors. For example, Hispanics reportedly prefer to recreate in outdoor areas that accommodate large groups and provide amenities such as cooking grills, picnic tables, access to clean water, and trash cans (Chavez 2002, Chavez and Olson 2009). And some ethnic minorities prefer to participate in activities that reflect their cultural heritage, such as gathering special forest products for food or crafts (Anderson et al. 2000).

In addition, climate change can potentially have on impact on outdoor recreation activities enjoyed by some underrepresented groups. For example, a trend toward hotter and drier conditions in parts of the nation may result in fewer or shorter duration opportunities for access to water resources. This potential shift may be a negative impact for Hispanic communities, as their primary recreation activities tend to be near streams, lakes, or other water bodies (Chavez and Olson 2009, Garnache et al. 2018). Understanding use rates, patterns, and preferences of underrepresented groups and low-income users, as well as barriers that limit their use, may help decisionmakers better serve these communities. However, underrepresentation of minorities has been an enduring problem for land management agencies in the United States, suggesting the need for policy and management changes to address existing inequities.

Barriers and Challenges

Outdoor recreation may be highly socially and culturally constructed, and language and terminology can reinforce the dominant norms that shape who visits public lands and what activities are endorsed or encouraged (Armstrong and Derrien 2019). Social class (wealth, power, and privilege), race, and gender all have contributed to an elite-driven model of conservation decisionmaking, with upper- and middle-class White men and women defining the norms for proper and even best outdoor recreational pursuits (Taylor 2016). Current patterns of outdoor recreation use, how recreation is defined or socially constructed, what we understand the values of recreation to be, and common knowledge about recreation may all contain cultural bias that is hidden in plain sight. Agencies responsible for the provision of recreation services often lack racially and ethnically diverse leadership and consequently may not be sensitive to the needs of diverse American publics (Gooden 2014). Issues of poverty may create barriers to participation that are difficult for public land managers to address. Furthermore, the limited availability of public green spaces in cities, which often are not accessible to minority or low-income populations, makes it difficult for underrepresented groups to participate in local- or neighborhood-scale outdoor activities.

The issues above can become manifest in general agency cultural and institutional barriers to diversifying recreation access and participation (Boone et al. 2009). Land management agencies have struggled for decades to reach underrepresented populations with little success. Agency policy and practices that have become normalized often reflect a White, middle-class orientation toward recreation. One example of this is the lack of accessible information about permits, passes, or fees required to use public lands, creating potential barriers to entry.

Moreover, trail signage and other public information typically appears only in English. Another example is a "one tent per site" policy as well as group size limits in day-use or designated camping areas. This policy implicitly favors small groups and nuclear families and presents a burden to large-group, extended-family visitors. Moreover, recreation policies that emphasize natural settings, dispersed use, and solitude, as opposed to activities that favor large groups and socializing, may inadvertently select against recreational preferences of ethnic minorities (Blahna and Black 1993, Gobster 2002). For example, the San Bernardino National Forest near Los Angeles set a commercial price level for permits to pick bracken fern fiddleheads, but the vast majority of participants were gathering fiddleheads for lifestyle (primarily Korean pickers) or recreational (primarily Japanese pickers) purposes (Anderson et al. 2000). Most pickers regarded the permit price as unfair and some thought it reflected a bias against Asian visitors to the forest. There have even been documented examples of overt racism and prejudice exhibited by park and forest managers (Blahna and Black 1993, Chavez 1993).

Another agency barrier that limits diversifying recreation participation is an emphasis on what happens inside the boundaries of parks, forests, or refuges. Euphemistically, this is referred to as focusing inside the "green line," and it can limit an agency's ability to reach out, understand, and tailor recreation opportunities to urban, tribal, and other underserved communities. Although it seems obvious that agencies focus management actions inside their own boundaries, that orientation is fundamentally at odds with an agency's desire to reach out and serve traditionally underserved populations (Collins and Brown 2007).

New Conceptual Approaches

Recreation managers may consider leveraging cultural diversity and the richness these cultures contain by developing approaches that engage with diverse cultural groups and connect them with their public lands. Approaches may include reducing barriers in the external environment, addressing the values of senior public administrators, creating a more diverse workforce, and creating learning opportunities for underserved populations, particularly at key stages in childhood, to learn about their public lands and how to enjoy, care, and work for them. Focusing on empowering and building social capital in these communities helps assure that their recreational and other preferences are being met, which can help managers improve outdoor recreation participation for these underserved communities by improving their relationship with public lands and building community with public lands at its

heart. See Armstrong and Derrien (2020) for more information on how language affects inclusivity.

There are some recent examples of how the Forest Service and nongovernmental organizations have been proactive in developing new approaches to improve access and increase participation of underserved communities to public land. For example, in a 2016 collaboration with a variety of community partners in the Los Angeles area, the Forest Service conducted a transportation pilot project. They operated a weekend shuttle bus from the Gold Line light-rail station in Arcadia to Chantry Flat in the Angeles National Forest to promote visits to the forest in a more engaging, convenient, and environmental way. The success of this pilot program led to a 6-month project (April to September 2018) to link the Pasadena Transit bus route and the Gold Line in Pasadena to hiking trails in the San Gabriel Mountains (Chen 2018). Furthermore, the nonprofit organization, Latino Outdoors, is active in many cities in the nation, providing diverse and family-focused outdoor recreation opportunities and connecting to the outdoors by using social media and storytelling to increase access to public lands (Flores and Kuhn 2018). Latino Outdoors brings Latino families and youth to the natural environment to build a sense of belonging and greater understanding of environmental awareness. From 2014 to 2018, Latino Outdoors grew from one person to 180 volunteers; 44 volunteers are leaders who have organized outings in 14 states across the country (Flores and Kuhn 2018). These types of local partnerships, community involvement efforts, and outreach approaches can potentially help public agencies improve access to outdoor recreation opportunities.

In general, agencies may seek resources and partnerships outside their boundaries to understand and attract visitors from diverse racial and ethnic backgrounds. Collaboration with nontraditional partners (e.g., churches, ethnic groups, social welfare agencies) will serve the needs and interests of nontraditional visitor groups and help communication and engagement efforts. In addition, efforts to diversify the natural resource agency workforce and assess existing promotion pathways for all workers will address concerns about institutionalized and normalized practices that unintentionally reinforce the dominant paradigm. There is a large body of literature on social equity and environmental justice that has been applied only marginally in natural resource and public land management fields. Concepts from this literature may be applied to help land management agencies better meet current and future needs to diversity visitor participation on public lands.

Compelling Questions

Some of the research questions we would like to address are:

1. What are the impacts to public welfare in underserved communities that are infrequent participants in public lands recreation? What are the economic and political effects of this low participation now and in the future?
2. How do we bridge the gap between creating a diversity of recreation opportunities and the lack of diversity in outdoor recreation participation? How do we provide opportunities that cater to entry-level recreation participants with little previous experience in the outdoors?
3. What are the impacts to or implications for outdoor recreation participation and support as the U.S. population grows and becomes more diverse?
4. What expectations will various ethnic groups have for outdoor recreation experiences and settings? What is the "disconnect" with opportunities being provided?
5. What can public agencies do to better serve the needs of visitors from diverse backgrounds?
6. What are the outdoor recreation activities or management strategies that can help increase participation of underrepresented groups? And where geographically are the best or emerging opportunities for change?
7. What are the effects of forest landscape changes on outdoor recreation visitors (visits, demographics, activities)?
8. What are some of the barriers and opportunities to outdoor recreation participation among low-income and underrepresented groups?

Synthesis

As the U.S. population becomes more diverse, and preferences to outdoor recreation activities change, new trends make it difficult to manage public lands. Better understanding of the changing recreational preferences and barriers of underserved communities can help managers increase access to outdoor recreation participation by improving the relationships of these communities with public lands. Social science research and management case studies are needed to study this phenomenon to develop successful management strategies.

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Chapter 4: Language in the Recreation World

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Purpose

Anthropologist Clifford Geertz described language as a cultural practice that provides a "template or blueprint for the organization of social and psychological processes" (1973: 216). Language matters because the way we speak becomes the blueprint for how we construct and manage our world. It holds power in framing issues, forming knowledge, and normalizing certain ways of interacting with the environment. The ways that we talk about recreation, including the very term "recreation," reproduce assumptions about people and places while influencing management actions and outcomes. This chapter addresses how language shapes not only recreation and its management, but also sustainable recreation research.

Our purpose is threefold: first, illuminate ways that language shapes recreation management work, particularly as it affects inclusivity; second, make a case for the need for managers to recognize how language influences practice and perception; and third, identify opportunities to better align research on recreation language with agency objectives. As recreation researchers and managers seek to create more just and sustainable recreation practices, let us begin with language that will guide us toward the cultural changes to which we aspire.

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Problem Statement

In "Standing by Words" (1983), Wendell Berry pointed to the faltering state of the human relationship with the environment and contended that if we want to rectify our relations with the natural world—and with each other—we must begin by changing our language. For centuries, humans have adopted language patterns that have mischaracterized our relationship with the environment, describing a "natural" world that stands apart from that which is "cultural" and is managed by humans rather than entwined with our cultural lives. Historically, these assumptions affected how land management problems were defined, and the language reinforced stereotypical myths about both land and visitors. Today, much of the language of land management perpetuates a dichotomous (i.e., people vs. nature) and power-laden (i.e., stewardship over nature) relationship between humans and the environment. These discursive practices have framed outdoor recreation as a bridge between human society and an external natural world, an artificial separation that people

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have learned through discourse. Research shows that children see nature woven throughout their daily life—as something that is accessible, playful, and social—but adults learn to envision a distant form of nature that they describe as more authentic, pure, and solitary (Kellert et al. 2017). As people learn to see themselves as separate from the natural world, they reproduce that belief in their language.

Other problems with language pertain to recreation management in particular. First, people often do not recognize the cultural specificity of their ways of thinking and communicating. Second, we grapple with misunderstandings of what science does and does not do. Third, our language patterns enable social distancing from our ideas. Finally, the language of the audience may not match the language of the managers.

Cultural specificity. Through discourse, paradigms of the past and situated cultural knowledge shape management actions. Bowers (2003) studied how people use root metaphors to frame ideas. These metaphors, such as "data" or "sustainability," become iconic truths, ordering our ways of thinking about the world as these metaphors are imparted through a culture. Thus, words create culturally specific truisms that underlie all communication. To further new ideas, we must shed the belief that language is merely a conduit for sharing objective information, recognizing instead that the metaphors that guide our communications create "situated knowledges" that differ between social groups.

Misunderstandings of science. Challenges also emerge from misunderstandings of what scientific research can and cannot offer land managers. Scientists use specialized language to convey data, information, research findings, and management recommendations. This language can set managers in pursuit of the impossible: stable, science-driven, permanent solutions to complex cultural problems. Moreover, public expectations of what science can achieve create an environment in which managers seek to rationalize political actions through disparate or incongruent scientific data. Science describes systems and relationships but can only imagine future outcomes. It is critical to recognize that scientific knowledge is still initiated, developed, and evaluated through social lenses, and that management decisions are inevitably human actions, no matter how scientifically informed.

Treatments of language as neutral can create the semblance of objectivity in decisionmaking processes, which are based on the value orientations of agencies and their personnel. The frame of science-informed management can overshadow the normative considerations that are inherent in weighing the multiple values and uses in decisionmaking. Which management values take priority in any given area? How are tradeoffs weighed and on what time scale? How are these affected by political whims and cultural trends?

The manner in which we talk about science creates those culturally specific metaphors that shape discourse. Halliday and Martin (1993) showed how science-speak masks human agency by removing actors from sentences. A science writer may take a phrase describing people doing something, such as "people travel off-trail," and transform it into a noun, "off-trail travel," making it a thing rather than a process. This shortcutting disguises individual agency, a framing that may decrease people's motivation to engage. Chenhansa and Schleppegrell (1998) found that when students could not identify an agent or actor in an environmental scenario, they saw the situation as simply an "accident." If researchers and managers want to influence human action, their language must not distance people from complex socioenvironmental problems.

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Social distance. The studies mentioned above illustrate how language promotes distancing from our ideas, presenting both opportunities and cautions for recreation managers. By using distancing language, managers may be able to back away from culturally rooted values that lead to posturing and diminished opportunities for collaborative action, but such language practices may also fail to involve people in affecting change. Engaged citizens who have equal opportunity to participate in the governance of their society form the core of democratic systems. In his discourse theory of democracy, Jürgen Habermas theorized that a deliberative democracy can exist only when citizens engage with ideas prior to decisionmaking, enabling them to set aside their own self-interest and take action on behalf of society. In this theory, our social systems and rational existence rely upon communication that enables all individuals to share and grapple with ideas in the public sphere. Language is the means for creating just societies.

Language of the audience. When using the term "recreation," the language of the audience often does not match the language of the managers. People who recreate rarely describe themselves as recreating, and certainly not as recreationists, a term that transforms action into a noun. An astounding example of the shortcomings of language, the word "recreation" (1) is not used or perhaps understood by people who are recreating, (2) fails to account for the variety of outdoor experiences, and (3) perpetuates an artificial separation between people and nature that has far-reaching consequences in our politics and identity. These linguistic inadequacies can be seen in many terms that permeate the land management profession, such as **wilderness**, **natural or cultural resources**, and even the word **nature** itself. Acknowledging that people carry a range of associations with all such terms will advance a new management paradigm rooted in an understanding that audiences have diverse expectations regarding human-nature interactions. As Blahna et al. (2020) describe in chapter 5 of this report, a more encompassing definition of outdoor recreation would "recognize the variety of connections that people have with natural and cultural landscapes, whether for leisure, lifestyle, livelihood, or health."

Dimensions of the Problem and New Conceptual Approaches

Dimension: language reinforces power relations—
Donna Haraway reminded us that "nature cannot pre-exist its construction," but that our ways of discussing the world create social nature (1992: 296). The things that people say at community meetings create new meanings, as do media coverage, scientific reports, and internal communications. This discourse creates a cultural ideal but is also a display of power over those who do not share the same cultural perception of nature. Efforts to build inclusivity must recognize power systems that pervade social institutions and how they are constituted.

The notion that all people should have equal access to public recreational lands is one such social construct. So too is the empowerment of the government as a legitimate caretaker of public lands. If the forests belong to the nation, this leaves little room for alternative individual or communal claims to the space. For example, the "It's All Yours" campaign on national forests uses language that may be marginalizing to tribal groups who feel that these lands are, in fact, no longer theirs. Language plays a powerful role in reinforcing colonial government authority in managing public lands. Simply by using the term "recreation," we create space for certain activities on the landscape while marginalizing those who work or live, rather than play, on the same land. Language has authority, affecting relationships and, consequently, people's engagement with agencies and outdoor recreation (Orbe 1998).

The ways that professionals use language have ripple effects in communities and workplaces. Allison and Hibbler (2004) studied how the language choices of recreation professionals created barriers to inclusion. One site put on "special" festivities to celebrate diversity alongside traditional programs, and the study showed that "there was an ongoing verbal, and more often nonverbal message communicated of the 'special,' yet marginal nature of such programs and that it was really the purview of the 'ethnic' staff to take responsibility for such programs" (Allison and Hibbler 2004: 272). The use of the word "special" not only created an unintentional culture of exclusion, but it supported additional work for minority staff members, affecting workplace dynamics.

The organizational structure of land management agencies creates rank, delegates authority, and determines who influences decisionmaking. Although all organizations must have common language to survive, the discourses they adopt inevitably integrate cultural associations into the vocabulary. Changes in bureaucratic practices could help reshape how we speak and think about recreation, for these practices become institutionalized as part of organizational culture. For example, language can transfer authority from a person to a position or to an agency as a whole. Note how frequently public discourse conflates the personal "I" with the

agency as a whole (for instance, from a June 7, 2018, news article: "The National Park Service has decided to transport 20 to 30 wolves to Isle Royale"). When do managers speak as a person or a position, when do they defer to the bureaucracy, and how do those word choices shape the power dynamics between communities and agencies?

Finally, the politics of language demand that we scrutinize whose voices speak and whose are heard. When decisions are made about public lands, some citizens have less experience advancing their needs, desires, or agendas. Some groups may be so marginalized that they do not participate, diminishing their power and ultimately offering them fewer opportunities to influence the public landscape. Moreover, deeper and more inclusive forms of public engagement have the potential to make the iterative cycle of meaning-making more productive and equitable, promoting engagements through which individuals are encouraged to think, share, and co-construct meanings, thereby broadening and institutionalizing diverse cultural values through discursive behaviors. New types of relationships between land managers and diverse publics have the potential to reform language and remake institutions, because they will generate the need for a vocabulary that responds to new understandings.

New conceptual approach: support equitable discourses—
Rethinking nature as social nature discursively reminds us that people's lives are entwined with those spaces. By attending to discourse, we may simultaneously find ways to take responsibility for the daily role of language in sustaining systems of power or perpetuating injustices, forging more just and equitable relationships. Changing language can change internal organizational culture and reshape external interactions. Authoritative agencies can approach less powerful groups with humility, expressed through language. Even changing simple linguistic patterns, such as the habit of choosing the pronoun "we" in association with any agency action, invites new actors into conversations. There are tremendous opportunities for researchers and managers, particularly those in leadership and training positions, to study, design, and implement such discursive practices.

Studying the implications of recreation language in terms of how it affects, and is affected by, race, class, nature, urban living, and leisure will enhance this exploration of sustainable recreation research and management. In chapter 3 of this report, Sanchez et al. (2020) point to the gradient on which outdoor activities take place and the critical limitations of traditional recreation research. Do we find new language for the practice and its associated management actions, or can we bring the broad range of outdoor engagements under the term "recreation?" One study identified numerous language approaches that might promote conservation-minded

When managers listen more closely to the words that people use to describe their relationship with these places, they can respond in ways that affirm those relationships.

voting, such as talking about recreation in terms of specific activities ("traditional" activities such as hiking or hunting, but also so-called "passive recreation examples" such as "simply enjoying nature"), which would help voters picture themselves as land users (Metz and Weigel 2013). When managers listen more closely to the words that people use to describe their relationship with these places, they can respond in ways that affirm those relationships.

Dimension: public participation, communication, and agency discourses—One of the main ways that agencies communicate with the public is through the mandate to provide opportunities for people to participate in planning processes. These interactions take many forms, but generally have a similar characteristic: the public is asked to respond to proposed management actions and plans. In this undertaking, the agency is the originator of the language framing the issue; it selects, names, and describes the issues to which the public is invited to respond. Through this framing, the language used inevitably does more than just reflect or project internally held meanings—it constructs the meanings and value systems into which others are invited "in" to comment. There also persists the risk that agencies are engaging in public participation simply to "check the boxes" of policy requirements in ways that fail to provide real opportunity to create meaningful involvement or change. Through this "politics of policy containment," bureaucratic frameworks narrow and even taint the possible fields for public action (Kuentzel and Ventriss 2012: 416).

Although government agencies employ professionals to help communicate and refine agency messaging, much of the institutional discourse of an agency is adopted through the informal talk of employees and collaborators. Land managers might be less apt to use more colloquial words such as "trees" and "woods" that are more common in the vocabulary of the majority of the population, favoring instead "timber" or "natural resources" (Kellert et al. 2017). Leaders who have spent their entire careers in an agency may struggle to separate agency parlance from more common language to which other groups may connect. The use of this technical jargon influences conceptions of who "belongs" as part of land management efforts, and who does not. People who can talk the talk (and understand the lexicon), have an easier entrance into the conversation and access to a seat at the table.

The legacy of who has controlled the vocabulary and subsequent discourse lingers, and keeps the stage set for the types of expertise that can contribute to public processes. But language and actions do not always correspond. For example, in the mid-1980s, the shift in the Forest Service's motto from words such as "management" to "caring" and "serving" reflected the agency's desire to frame noncommodity uses (Kennedy and Quigley 1998). Researchers found, however, that agency

employees, though personally aligned with the "caring" and "serving" orientation, thought that the traditional prioritization of timber and range still prevailed over other values (such as providing opportunities for recreation) (Cramer et al. 1993). This shows that language adjustments must be more than superficial to change organizational culture and behavior.

New conceptual approach: articulate values in decisionmaking—
To what values of public lands do management agencies choose to give voice? A lack of consideration of which social constructions are perpetuated in land management planning can result in monolithic representations of social phenomena. When societal influences on decisionmaking are clearly articulated, the values and foundations upon which decisions are made can be appreciated by all (Derrien et al. 2015). The Plain Writing Act of 2010 mandated that agency forms and documents be written in a "clear, concise, well organized" manner. In addition to implementing that legislation in earnest, agencies also might attend to, question, and communicate the value basis of their decisions. These values-based decisions could be embraced and given full billing in decision documents and public communications.

Dimension: language of certainty and truth—
The term "wicked problem" has emerged in recent years as a way to characterize issues that are divergent and socially complex, and that lack a singular endpoint or solution (Rittel and Webber 1973). Conceptually, the term reminds us that issues like climate change, poverty, and social injustice are impossible to solve because of their scale, interconnectedness, and human values involved. Our human cognition pushes us to desire perfect solutions for every problem, which inhibits our ability to embrace complexity. We filter information by imagining patterns where no patterns exist, or relying on numbers because they give an illusion of certainty (Cockerill et al. 2017). Thus, people often turn to science, which speaks in quantitative statements, to "solve" issues that must be addressed by social action.

People have long held this faith that managers can solve problems, no matter how complex. Indeed, the public has been shown to be critical of media reports that do not offer solutions to perceived problems (Kensicki 2004). Land management agencies also have thrived on scientific reason: "Since its early roots in Progressive-era conservation, the U.S. Forest Service has championed the paradigm of technical rationality and empirical science as the basis for sound resource management practices" (Ryan and Cerveny 2010: 594). In this new management paradigm, more managers are recognizing that dynamic, complex, uncertain systems require adaptive, values-driven management approaches.

Similarly, in the field of recreation research, patterns persist that push scholars to promote certainty where none exists. Academic publications tend to pair a stated problem with concrete solutions and recommended actions. This reinforces the belief that experts should bear the responsibility of social problem-solving, confounding scientific study and science-generated knowledge with management recommendations that will always be rooted in human judgment and uncertainty.

Language practices must shift away from science that reveals how the world works toward nuanced understanding of what scientists can and cannot contribute to management decisions.

New conceptual approach: articulate uncertainty—
In the new recreation paradigm, language practices must shift away from science that reveals how the world works toward nuanced understanding of what scientists can and cannot contribute to management decisions. Moreover, scientists would clearly articulate the limitations of certainty, given how their language shapes political outcomes.

Researchers can adopt language that embraces complexity and conveys how science influences action. Scientists who work in the field must be aware that their words have cultural meanings beyond the scientific literature. Using a term like "restoration," for example, enables the possibility of compensating for misdeeds while allowing people to continue sinning: Why change our behavior if we can simply restore the system? (Cockerill et al. 2017). The term, though descriptive and functional to scientists and managers, is not neutral in its social effect. Adopting language that describes uncertain, dynamic systems paves the way for politics that acknowledge the collective human values entwined with and engrained in environmental management.

Accepting uncertainty is daily practice in the work of environmental managers and can be manifest when communicating about environmental work. Institutional commitment to do so has potential to shift public perception of the work of recreation managers. If managers will not shy away from acknowledging uncertainty in decisionmaking processes, the language of management can more fully recognize that there are tradeoffs in every management action. Most decisions are informed by societal values and cannot be answered through scientific study alone.

Compelling Questions

1. What characterizes the language used in communication about recreation? How does language differ between scientific and management publications, and written and spoken language? Future research should analyze multiple modes of science and agency communications (i.e., management plans, press releases, signs, interpretive programs, and external communication) and identify common practices that may have unintended consequences.
2. What are the measurable outcomes of language choices in recreation work?
3. What can land managers learn from listening to the words that people use to describe their interactions with the out-of-doors?

4. How can agencies more clearly articulate the relationship they want to foster with citizens? Case study research should explore effective language practices in successful collaborations.
5. How are messages received by different communities? How can communication strategies be evaluated?
6. How do interest groups influence recreation management decisions through discourse? Which discourses have more, less, or different effects? Whose interests are represented in public communications and how does this affect management actions?
7. How have (and might) recreation studies embrace scientific uncertainty and express it through language? How does such research language affect management practices?
8. How might an applied language research agenda support improved management practices and decisionmaking?

Conclusions

Communicating with the public is one of the major activities of land management agencies, yet there is very little evaluation of the impacts and effects of language on agency work and public landscapes. How might such assessment be integrated into how organizations do business? By what measures are the outcomes of our language practices evaluated? This chapter has argued for the value of such research and the vitality of language practice as a blueprint for creating an inclusive, accessible, and just recreational world.

Language evolves, and language practices within land management agencies change continually, but the broad cultural shifts that must take place to foster just and equitable discourse will take time. Still, we encourage researchers and managers, particularly as they embark on the pursuit of more sustainable recreation practices, to be bold in trying new language. Listen to how it is received. Observe language use in a systematic way, then evaluate its effects. Take time to find the words that best communicate your message to your audience. Be wary of catch phrases and jargon that shortcut the work of speaking precisely and deliberately. Be unflinching in bringing values-based language into decisionmaking processes, acknowledging the limitations of scientific knowledge. Resist the social pressure to offer tidy solutions to complex problems.

Attention to language practices is about far more than publishing bilingual brochures or translating policy documents. The study of language must push us to create discourses that better serve the public, both by improving relationships between agencies and citizens and by creating agency cultures that work more effectively to steward public land resources.

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Part II: What Is the Nature of Outdoor Experiences?

Chapter 5: Rethinking "Outdoor Recreation" to Account for the Diversity of Human Experiences and Connections to Public Lands

Dale J. Blahna, Lee K. Cerveny, Daniel R. Williams, Jeffrey D. Kline, Matthew Helmer, Stephen F. McCool, and Francisco Valenzuela[1]

> All crises begin with the blurring of a paradigm and the consequent loosening of the rules for normal research.
>
> —Thomas S. Kuhn, *The Structure of Scientific Revolutions* (1962)

Purpose

This chapter explores the historical use and application of the term "outdoor recreation" as an organizing theme for sustainable public land management planning. We suggest that agencies need a more encompassing concept and approach to management involving people—one that recognizes the variety of connections that people have with natural and cultural landscapes, whether for leisure, lifestyle, livelihood, or health. This perspective suggests the need to move from a "recreation as leisure" focus to more of a "recreation as human connections" approach to public land management that better reflects the ways in which people use and value public lands.

Problem Statement

Outdoor recreation is the primary use of most public lands in the United States. For example, a recent study by the U.S. Forest Service found that 85 percent of people who visit national forests do so for recreation (USDA FS 2010). Moreover, the economic activity (e.g., local jobs, income, and tax revenue) associated with national forest recreation far outweighs all other economic contributions from national forests combined. Studies specific to recreation on federal lands show that visitors contribute at least $51 billion to local economies around their federal recreation destination (English et al. 2014). Despite the economic importance of recreation on public lands, visitor use and economic benefit estimates are based on only a subset

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of traditional recreation activities, such as hiking, skiing, boating, hunting, and fishing. For these activities, we have good models and data for estimating national participation rates, visitor expenditures, and community economic value (English et al. 2014, Rosenberger et al. 2017, White et al. 2016). But these activities do not capture many of the other important ways that people interact with and value public lands, including religious, spiritual, cultural, sustenance, and tribal connections; gathering firewood and hundreds of different wild products for food, medicines, and crafts; participation in shared stewardship and voluntary restoration activities; physical and mental health, therapy, and education values; community sense of place and lifestyle connections; and others (fig. 5.1). For many people, these activities fulfill a vital part of their lives that go beyond simple leisure time and into the realms of cultural values, lifeways, and livelihoods. Our ability to measure and understand these types of human-landscape connections are not well understood relative to

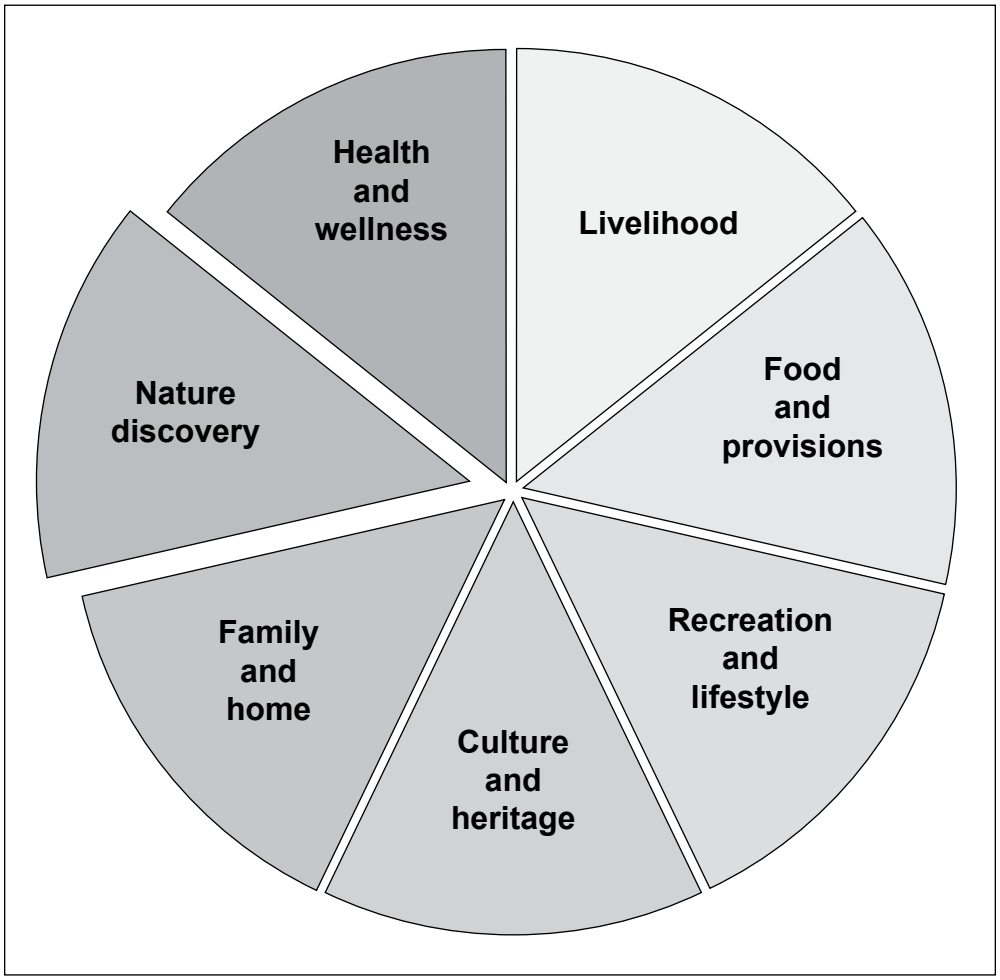

Figure 5.1—Multiple value themes attributed to activities conducted on the Olympic National Forest as identified by human ecology mapping (Cerveny et al. 2017).

more traditionally defined recreation activities. We believe that this discrepancy is tied to lack of agreement about what the concept of "recreation" encompasses and unstated assumptions that go along with the term that limit our abilities to measure and understand a broader suite of human interactions with protected areas.

In this chapter, we develop a rationale for expanding the concept of recreation to include a broader range of human uses, experiences, and connections to public lands, and consider new and more inclusive research and management tools for integrating the broad array of these human-nature relationships in landscape planning and decisionmaking. Our goal is to elevate the importance of what has been called "recreation" in land management agencies to better reflect the diversity and magnitudes of values regarding recreation uses and to improve policy and decisionmaking. Ideally, this broadened scope will help us move from a "recreation as leisure" focus to more of a "recreation as human connections" approach that better reflects the ways in which people use and value public lands.

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Dimensions of the Problem

The existing management and planning emphasis on what might be called traditional recreational activities dates back to the mid-20th century (Collins and Brown 2007). During the so-called "recreation boom" following World War II, state and national parks, forests, wildlife refuges, and resource lands all saw dramatic increases in recreation visits. As a result, thousands of studies of outdoor recreation participation, experience expectations, economic value, and ecological impacts were conducted from the 1970s to 1990s and were used to develop recreation planning and management strategies. The recreation activities these tools focused on have come to define our image of what constitutes outdoor recreation, namely sporting and leisure activities. But there have been many demographic, behavioral, sociocultural, and economic changes since then, which have transformed the recreational landscape of the 21st century.

Urbanization and racial and ethnic diversification are the dominant demographic changes of the past two decades nationally. Leisure time activity patterns have also changed (Collins and Brown 2007). Compared to those in the 1970s, trips today tend to be shorter in duration, closer to home or to highly visible or iconic destinations, and with greater focus on tour packages and guided trips. Many rural economies have shifted from resource production to service- and recreation-based economies, and corresponding meanings and values of public lands for some of these community residents have also changed (Vias 1999). For example, Cordell and Overdest (2001) found that 74 percent of the nation's top retirement destinations were in counties adjacent to national forests, parks, and grasslands. American

Although discretionary uses and social meanings of public lands have diversified in the past 50 years, the recreation "silo" of public land management agencies has remained relatively static.

Indian hunting, fishing, access, and treaty rights are being enforced and now include heritage sites and spiritual connections. The dawning of the digital era has changed activity use patterns and management issues (Collins and Brown 2007) and research needs and opportunities (Champ et al. 2013, Tenkanen et al. 2017, Wood et al. 2013).

Barriers and Challenges

Although discretionary uses and social meanings of public lands have diversified in the past 50 years, the recreation "silo" of public land management agencies has remained relatively static. Agencies allocate work across very specific and highly defined programs with standard operating procedures to assure adherence to regulations and guidelines (Wilson 2000). These procedures can become entrenched and continue into the future well after their original purpose or programmatic value has waned, with innovation and creativity ultimately suffering. This problem also exists in research, where scientists and research funding become entrenched in certain conceptual and methodological patterns known as "scientific paradigms" (Kuhn 1962). These silos can restrict how and why resources and opportunities are managed and studied; it is difficult for agency staff, policymakers, and researchers to work across silos and to consider issues outside the prevailing paradigm (or beyond the organizational norms) of their particular silo.

As noted in the prologue (Cerveny et al. 2020a), recreation has become one of several silos of land management agencies, rather than an integrated program attempting to achieve a particular vision for multiple human connections with public lands. Certain types of human uses have been tossed into the recreation basket, but not others, and people who manage recreation are trained to focus on certain leisure time activities like hiking, camping, and boating, while other lifestyle and cultural activities have no bureaucratic home or are spread unevenly across other agency silos, like engineering, heritage resources, public services, public use permits, partnerships, and law enforcement. Each of these functional units, in both management and in research, have different organizational structures, training requirements, reporting metrics and methods, and promotion standards. Although specialized expertise and training are important, there is often little communication and integration across silos (fig. 5.2). Although many public land management agencies now include addressing ecosystem services as an integrated approach to describing human-public land connections, how well this approach can overcome the conceptual inertia of longstanding silos remains uncertain (Kline et al. 2013). The identification, planning, and monitoring of many types of human connections to public lands, broadly defined, can be uncoordinated and inconsistent, which may make them appear less tangible and useful for planning and decisionmaking.

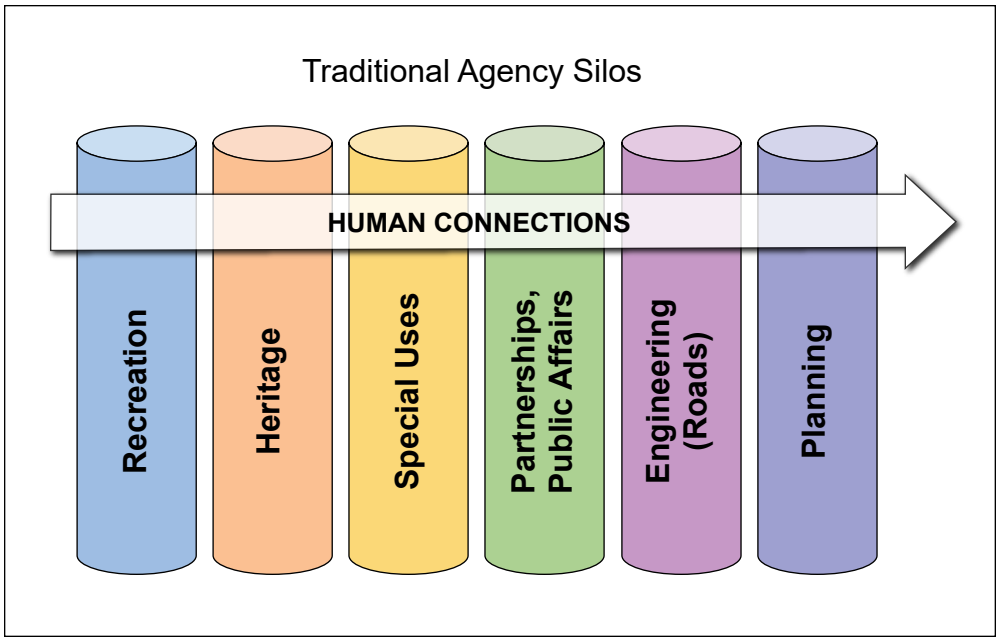

Figure 5.2—Traditional agency silos with hypothetical cross-linkages to account for "human connections" to public lands.

Recreation is often treated as a less essential use of public lands than resource production, wildlife habitat, landscape restoration, and fire and fuels reduction activities. This point came up often in a survey conducted in preparation for the 2018 Sustainable Recreation Research Workshop. One respondent commented, "Recreation and tourism are given short shrift in the agency. Overemphasis on timber and range products ignores what people come to the forest for, including hiking, camping, fishing, or hunting. Basically the agency patches together a program that should be its major emphasis." In the *National Report on Sustainable Forests—2010* (USDA FS 2011), just 4 out of 134 pages of forest sustainability metrics are directly related to sustainable recreation, with vastly more metrics addressing wildlife, timber production, soil and water conservation, and other more traditional resource use and environmental topics. But the report also identified many social and psychological benefits of forests such as spiritual, heritage, sense of place, and other social and cultural values for which there are few or no specific metrics.

The barrier here may involve inadequate recognition of outdoor activity and nature contact as critical elements in human health, well-being, and lifestyles. This may stem from conceptions of outdoor recreation as play activities that are merely fun and entirely discretionary. However, given that work and leisure increasingly are melding in American lifestyles (Florida 2002, Frumkin et al. 2017), the artificial bifurcation of work and play ultimately may lead to an oversimplification of the human benefits of visiting public lands. For example, Anderson et al. (2000)

The bifurcation of work and play ultimately may lead to an oversimplification of the human benefits of visiting public lands.

found three distinctive goals for picking bracken fern fiddleheads on the Angeles National Forest: recreation, tradition/lifestyle pursuits, and commercial sale. This is probably typical of forest product gathering activities, as well as many health (e.g., run or outdoor excursion clubs, wilderness therapy), lifestyle (e.g., "hobby" ranching and prospecting), and volunteer stewardship activities (e.g., watershed restoration and trail maintenance) conducted on public lands. It can also be argued that human well-being is equally influenced by the quality of one's relationship to natural places and the sense of being an active part of a community (Williams and Patterson 2008).

A challenge for recreation managers is overcoming the trap of past mental models that have focused on the notion that recreation is a mix of a small set of activities and a small set of settings that result in recreation satisfaction and then a resultant desired benefit. The Recreation Opportunity Spectrum (ROS), for example, which is the dominant recreation analysis tool of the Forest Service and the Bureau of Land Management (BLM), is a case in point. The ROS is an abstraction of human experiences that classifies an agency's lands into six very general categories (urban, rural, roaded natural, semi-primitive motorized, semi-primitive non-motorized, and primitive) based on seven criteria (remoteness, access, naturalness, facilities, social encounters, visitor impacts, and management characteristics). This abstraction has taken the diversity of the natural world and our relationship to it and has reduced the richness and complexity of our imagination (Feyerabend 1999). Today, the ROS appears overly reductionist and does not recognize the simultaneous effects of incongruous setting characteristics and personal and social experiences in time, space, mind, or memory (Cerveny et al. 2011, Stankey 1999).

In the 21st century, agency policies and leadership priorities are emphasizing increasing visitor use and access, diversifying the visitor base, enhancing experiences, sharing stewardship, and expanding collaborators in land management and decisionmaking.

Like ROS, most visitor management concepts and tools used today were developed in the 1970s and 1980s (Cerveny et al. 2011). They reflect the post World War II "recreation boom" mentality, when a new generation of recreationists provided new challenges to managers, and recreation use levels, visitor conflicts, resource impacts, and crowding became dominant agency concerns (Manning 2010). In the 21st century, agency policies and leadership priorities are emphasizing **increasing** visitor use and access, diversifying the visitor base, enhancing experiences, sharing stewardship, and expanding collaborators in land management and decisionmaking (Collins and Brown 2007). As noted in the prologue (Cerveny et al. 2020a), these are very different from the boom era concerns, and concepts like visitor satisfaction, specialization, and carrying capacity are ghosts of past models that are limiting our ability to address today's challenges. Even terms like "user" and "visitor" are questionable, connoting a distance between people and the landscape (see chapter 4 (Armstrong and Derrien 2020) for other potential language

anachronisms). As we embrace a more human ecology frame of seeing people as part and parcel with nature, new mental models are needed. In this era, a broader interpretation and melding of concepts related to visitors, communities, lifestyles, and shared responsibilities toward the land are needed.

These challenges have their sources in a paradigm of recreation management that is less suitable to 21st century America, a country culturally, ethnically, economically, and recreationally more diverse than when the outdoor recreation paradigm first emerged. Recreation technologies, digital media, and advanced geopositioning tools also change the cultural landscape of recreation, potentially polarizing use patterns based on income, information, and access to gear, gadgets, and goods. The existing paradigm thus results in new uses being underemphasized in planning, decisionmaking, and other administrative activities because managers, scientists, and administrators simply have not seen them as recreation.

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New Conceptual Approaches and Opportunities

The past 30 years have seen hundreds of studies of different forms of human connections to public lands, including sense of place, rural community resilience, tribal heritage and traditional uses, gathering special forest products, restoration volunteerism, and many others. A broader conceptual approach is needed to link these existing research themes with agency policies and practices to expand the recreation paradigm to account for this diversity of uses and values.

A paradigm or mental model is a way of seeing the world through a particular lens. That new lens allows us to see things we currently do not see, such as activities, experiences, and benefits for public lands that most planners do not currently incorporate or consider relevant. New paradigms arise when normal ways of doing something no longer work well (Funtowicz and Ravetz 1990, Kuhn 1962). In the case of public land recreation, reduced agency capacity and budgets (Cerveny et al. 2020b), and lack of influence in decisionmaking in spite of expanding recreational demand, all suggest that the recreation paradigm is no longer as effective as it once was. However, there are areas of research and policy that suggest a more expansive approach to recreation.

Policy basis for expanding concept of recreation—
The legal basis for expanding the description and role of recreation in land management agencies arguably already is present in existing legislation and policies. For example, in a review of Forest Service policies, permits, and management implementation guidelines, Endter-Wada and Blahna (2011) developed the Linkages to Public Lands Framework, which identified the legal foundation for five major categories of public land use and access rights: tribal

linkages, general public use linkages, neighboring land linkages, interest linkages, and decisionmaking linkages. Besides recreation, these categories include uses such as permitted access and gathering rights, historical or cultural interests, volunteers and partners, research and scientific interests, and many other rights of access and use that the public has to national forests and grasslands. For example, adding the relatively new and underutilized regulatory concept of Traditional Cultural Properties to the National Historic Preservation Act is an attempt to better encapsulate and manage for cultural attachments to place by living communities at the landscape level, which can be tied into resource protection through the National Register of Historic Places. Ethnographic assessments are another research tool used to better understand and manage for cultural affiliations to public lands, primarily used by the National Park Service, which could be expanded to an interagency level.

The key contribution of an ecosystem services approach to recreation is its potential to help bridge the divide between biophysical and social management and research silos.

Ecosystem services—
One promising approach for expanding our understanding and use of the diversity of human connections to public lands is ecosystem services. Ecosystem services analyses seek to describe and measure the broad array of benefits that a landscape provides in terms of human values or outcomes (Costanza et al. 1997, Millennium Ecosystem Assessment 2005). Many federal agencies are now mandated to address impacts to ecosystem services when evaluating agency management actions. For example, the 2012 forest planning rule requires Forest Service personnel to consider and address ecosystem services as they prepare national forest land and resource management plans (USDA FS 2012). An often-identified major category of ecosystem services is "cultural ecosystem services," which includes recreation but also other human activities and experiences on public lands, including those relating to religious, spiritual, educational, and inspirational values; to sense of place, and to mental and physical health, among others (fig. 5.3). The key contribution of an ecosystem services approach to recreation is its potential to help bridge the divide between biophysical and social management and research silos, and present a framework in which previously divergent land management issues can be given equitable representation by integrating resource analysis across programmatic silos (Jaworski et al. 2018, Smith et al. 2011). How well the ecosystem services approach can live up to its promise remains to be determined.

Several federal agencies have adopted ecosystem service analyses for planning and decisionmaking, and there is now a large body of literature and even journals and university curricula dedicated to the study of ecosystem services. Ecosystem service measures and metrics, however, are not universals; they need to be adapted to different management contexts and planning questions to reflect

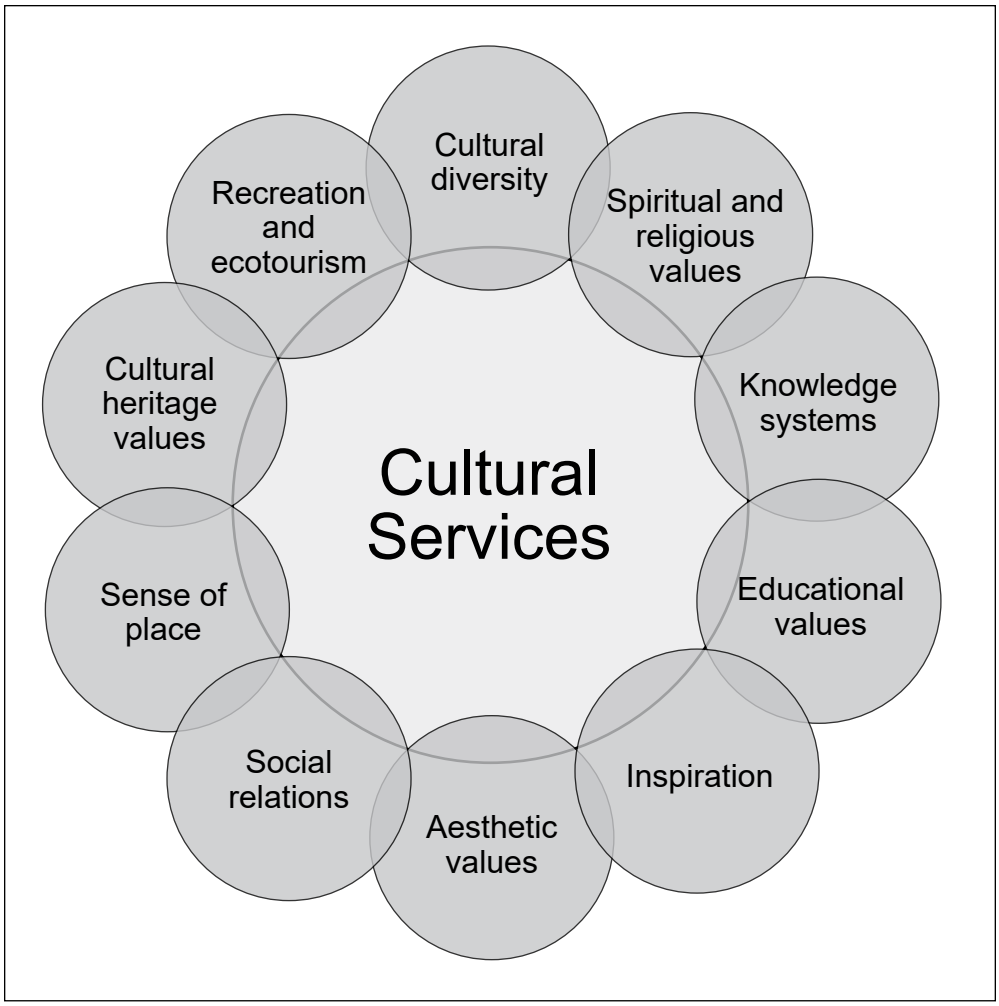

Figure 5.3—The array of cultural ecosystem services described by the Millennium Ecosystem Assessment (2005). Illustration adapted from Hølleland et al. (2017: 212).

the understanding that value is co-created by the kind of interactions and human experiences of natural areas (Asah et al. 2012). The ecosystem services approach also has been criticized for focusing entirely on human benefits rather than intrinsic and intangible values that ecosystems may provide (Chan et al. 2012, Silvertown 2015). As a result, there have been a number of recommendations for moving the field beyond simply monetizing ecosystem service values. For example, Kline and Mazotta (2012) argued for more flexible and diverse approaches to displaying ecosystem service benefit values using different types of quantitative and even qualitative representations of values for use in decisionmaking. Developing such approaches will be critical if we are to expand the identification and analyses of nature experiences as we recommend in this chapter and in chapter 6 (Wolf et al. 2020).

Although ecosystem services analyses provide methods for classifying and accounting for the diverse types of human connections to the land, many other questions must be addressed to plan and manage for sustainable recreation. For example, how do we collect data and implement ecosystem service analyses during times of diminishing capacity? Also, ecosystem service analyses do not typically link people's actions and behaviors to specific sites and landscapes, which is critical for evaluating management tradeoffs (Blahna et al. 2017). Site management application case studies are beginning to be documented, but a body of literature and generalizable principles that are feasible in public land management application still need further development and refinement (Blahna et al. 2020).

Nature and the human spirit—
An early approach to broadening the concept and meaning of outdoor recreation was published by B.L. Driver et al. (1999) in *Nature and the Human Spirit: Toward an Expanded Land Management Ethic*. This book was a compendium of "hard-to-define nature-based human experiences" derived from a wide variety of disciplines. The editors drew on literature and anecdotes from spirituality, art, ecology, human health, feminism, behavioral sciences, and many other areas. It was an expansive treatise and, in a way, a precursor of cultural ecosystems services but from a qualitative perspective. The work led to a line of research activity known as benefits-based management (BBM) in the Forest Service and BLM. BBM was highly descriptive and not operationalized by the Forest Service (Cerveny et al. 2011), although the BLM has implemented some aspects in its planning processes.

Sense of place—
Another approach to describe human connections to public lands that goes beyond traditional recreation uses, is "sense of place." In a now classic paper entitled "Beyond the commodity metaphor: examining emotional and symbolic attachment to place," Williams et al. (1992) applied the geographic concept of **place** to natural areas and public lands. They recommended a conceptual reorientation of recreation from the past focus on instrumental benefits provided by activities, setting characteristics, and tangible experiences (e.g., solitude) to recognize that certain areas, places, or landscapes have deeper and more emotional meanings and attachments for people. These attachments and meanings result from a history of use, family traditions, cultural meanings, and many other factors unique to an individual's or group's past experiences in specific outdoor settings. Borrowing from the humanistic or phenomenological geography theories of Tuan (1977), place concepts combine geographic, historical, emotional, and cognitive psychology dimensions to the standard social psychological experiences that dominate our current approaches to managing outdoor recreation. Unique, traditional, repeated,

or highly meaningful experiences may all lend more importance to certain places that cannot be described by landscape or experience characteristics alone. It also broadens the traditional bifurcation of work and play. Work activities such as ranching or logging may contribute to one's sense of place on public land as well as outdoor recreation activities. Sense-of-place concepts have spawned hundreds of studies of the role of place in public land experiences.

Unique, traditional, repeated, or highly meaningful experiences may all lend more importance to certain places that cannot be described by landscape or experience characteristics alone.

Mapping places, activities, and values—
Participatory action research methods for mapping connections with landscapes and place have been widely employed and have revealed the diversity of values, uses, and interactions between people and nature (Brown et al. 2015, McLain et al. 2013). Cerveny et al. (2017) found that "work" was a common response given for place uses, but that work and classic recreation activities were often listed by respondents as occurring at the same place. Furthermore, recreation activities were commonly described in terms that demonstrated values of family connection and making memorable experiences. Mapping can also have important and specific management implications. For example, Eisenhauer et al. (2000) found that special places on public lands in southern Utah are not substitutable, and many conflicts resulting from limiting use in these areas have deep seated and emotional bases that may seem outsized to managers.

We also need better methodological development and linkages to agency planning and management applications. Human Ecology Mapping and related approaches (Cerveny et al. 2017) is an approach that attempts to address some of these methodological needs in a variety of geographic, jurisdictional, agency planning, and management issue contexts. Human Ecology Mapping encourages participants to identify and map outdoor activities and landscape values or benefits that are not well captured in the old recreation paradigm (fig. 5.1). The approach allows the spatial depiction of an array of activities and experiences that may co-occur within particular places in ways that blur the boundaries of leisure/lifestyle/livelihood. In general, human ecology mapping, sense-of-place mapping, and other participatory mapping approaches have the potential for melding ecosystem services, sense of place, and human connections information to be integrated with environmental data in public land planning and decisionmaking (Cacciapaglia and Yung 2013, Gunderson and Watson 2007, McLain et al. 2013).

Eudemonic values—
Most discussions of conservation and public land use values focus on hedonic (instrumental) and moral (intrinsic) values. Eudemonic values have been identified as a third fundamental human value for protecting nature, but they receive little attention in the literature or in management or policy discussions (Chan et al.

2016, van den Born et al. 2018). Eudemonic (or relational) value is the idea that, to understand human actions, interactions, and even moral foundations with nature, it is important to understand one's views of the appropriateness of relationships rather than simply what benefits them, others, or nature (instrumental and intrinsic values) (Chan et al. 2016). Tribal connections, for example, are not based solely on personal benefits or the land's intrinsic right to exist, but on beliefs of appropriate interactions between people and the land. Appropriate interactions are moral expressions of what is a meaningful, worthwhile, and well-lived life (van den Born et al. 2018). In this way, eudemonic values reflect the ethics, values, and cultural identity inherent in human interactions with the land that is found in the traditional ecological knowledge literature (Houde 2007), but broader and applied to all stakeholder groups rather than focusing on First Nations and indigenous peoples. Cultural differences in ethical implications of human and nature relations are also discussed in chapter 4 (Armstrong and Derrien 2020), along with international cross-cultural case studies in chapter 7 (Valenzuela 2020).

Eudemonic (or relational) value is the idea that it is important to understand one's views of the appropriateness of relationships rather than simply what benefits them, others, or nature (instrumental and intrinsic values).

Outdoor activities and behaviors may be thought of as expressions of appropriateness or meaningfulness of social interactions with natural settings. In addition to tribal linkages, eudemonic values may be represented by many nonrecreational interactions with public lands that have been identified in the literature, such as participation in stewardship, restoration, voluntary, and research activities (Asah and Blahna 2013, Brooks et al. 2006, Charnley 2006, Guiney and Oberhausen 2009, van den Born et al. 2018). These activities help one to live a meaningful life and to make a positive difference in the world. A better understanding of how eudemonic values relate to and influence people's outdoor behaviors and their attitudes toward agency management actions may help provide a richer understanding of outdoor experiences and the many ways that people connect with and value public lands beyond instrumental, intrinsic, and even symbolic values of nature.

Compelling Questions

1. How can we redefine or reconfigure existing definitions and descriptions of outdoor recreation to better account for the diversity of human uses, values, and connections to public lands?
2. In what ways do existing laws, policies, and regulatory frameworks already facilitate and foster recreation and human connections as a consideration in public lands management?
3. How can we describe, map, or display human connections to public lands in ways that are broader and more inclusive than traditional instrumental values like recreation activities, experience expectations, and personal benefits?
4. How can ecosystem services be used to describe and display value estimates (monetary, quantitative, and qualitative) of the many different

types of human connections to public lands so that cultural ecosystem services can be considered along with provisioning, supporting, and regulating ecosystem services in public land policy and decisionmaking?

5. How can cultural ecosystem services be operationalized with a focus on geographic place and at different scales to make them easier for managers to implement?
6. How can sense of place and intrinsic and eudemonic values be incorporated in agency policy and management related to human connections to the land?
7. What are the public health and well-being implications of visiting public lands?
8. How can we integrate human connections to the land in planning and management and better coordinate decisionmaking across agency silos?

Synthesis and Conclusions

Shifting social values, demographics, and economic conditions have changed how, where, and when Americans use, value, and interact with public lands. A new paradigm of human connection to public lands is needed to ensure that "outdoor recreation" is politically relevant, ecologically sustainable, and responsive to human needs and wants.

Recreation and other ways that people connect to public lands are not just about discretionary time and leisure experiences. They are also about lifestyle choices.

Recreation and other ways that people connect to public lands are not just about discretionary time and leisure experiences. They are also about lifestyle choices that are partially but not entirely discretionary (Florida 2002, Haggard and Williams 1992, West 1984), as well as the historical, traditional, and emotional attachments people have to certain landscapes and the role that outdoor experiences play in living a meaningful life. Work, leisure, and social interactions can combine in diverse, dramatic, and even mysterious ways to explain how and why people have special connections to the land. In this report, we hope to reconceptualize or at least broaden our understanding of "outdoor recreation." The goal is to provide agencies with a better understanding of the nature of outdoor experiences, and of policies, management actions, and planning strategies that may help us to better incorporate the many and diverse ways that people connect with public lands. Land management agencies are moving toward a more inclusive view of public uses and outdoor experiences that goes beyond instrumental values, and it is important to incorporate new concepts and tools in sustainable recreation management and research efforts. We identified a few conceptual approaches for understanding some of these human connections, but there is little synthesis of these conceptual approaches in existing land management procedures, policies, and silos. We believe this change will require a paradigm shift from the traditional, instrumental, and agency silo-bound description of recreation to a broader and more inclusive notion of what constitutes human connections to public lands.

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Chapter 6: Nature, Outdoor Experiences, and Human Health

Kathleen L. Wolf, Monika M. Derrien, Linda E. Kruger, and Teresa L. Penbrooke

> The indescribable innocence of and beneficence of Nature—of sun and wind and rain, of summer and winter—such health, such cheer, they afford forever!
>
> —Henry David Thoreau

Purpose

Recent scientific studies from around the world identify a broad array of human health benefits associated with experiences of nearby nature. This chapter explores how the current surge in health response science can inform recreation facilities planning and programming on both rural and urban public lands, at local to regional scales. We also introduce a number of evidence-based active living and nature-for-health initiatives—both conceptually and literally—that have emerged in communities across the country and that can be implemented across the entire landscape gradient.

This collection of ideas concerning outdoor activity and human health represents a paradigm shift in several ways. First, human health response has been implicit in many recreation plans and lands, yet explicit health-centered goal setting suggests new opportunities for visitor recruitment and retention. Second, an all-lands outlook, from a human health perspective, extends connectivity of recreation facilities beyond the public land boundary into nearby neighborhoods, and into partnerships with local governments. Finally, exploring the contributions of outdoor activity to human health initiates collaborations with nontraditional partners whose work is not based in natural resources, but who can offer valuable insights into visitor benefits. Such partners include medical professionals, public health departments, and community organizers. Looking back to chapter 2 (Cerveny et al. 2020), a human health lens also shifts the notion of "recreation as leisure" to one of "recreation as human connections" and expands the notion to acknowledge the importance of nature-based activity in everyday life.

Recreation is more than leisure . . . it supports human connections and wellness.

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This chapter is anchored by research in urban settings. The *Green Cities: Good Health* website (University of Washington 2016) presents summaries representing multiple categories of nature and health benefits, based on a database of about 4,200 peer-reviewed articles plus related technical publications (fig. 6.1). The collection does not focus only on recreation, and generally does not include allied studies about human health benefits associated with more rural or wildland landscapes. Nevertheless, this nature and health literature points to trends and insights that are associated with recreation, such as increased understanding of the role of nature in active living, mental health and function, and wellness and physiology. The studies confirm the importance of being able to spend time outdoors, from everyday places to more distant public lands.

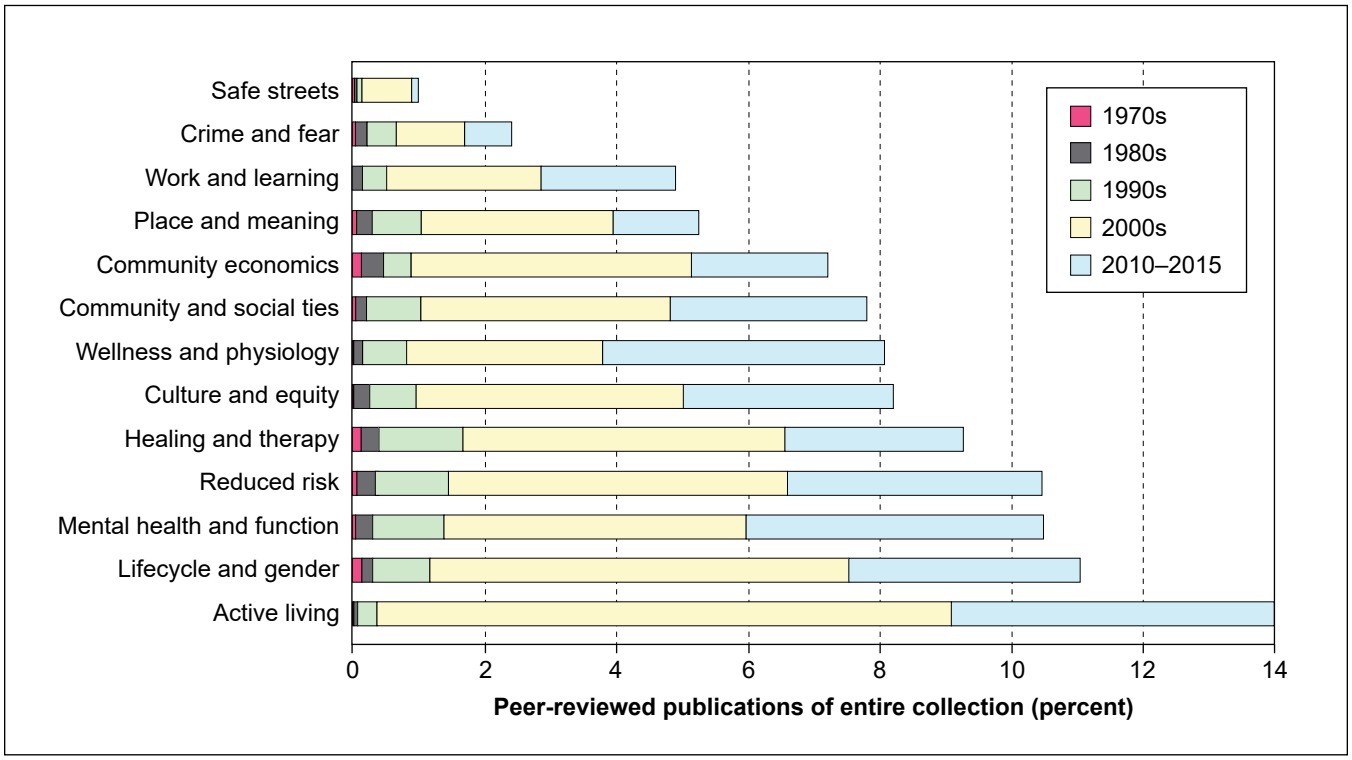

Figure 6.1—Green Cities: Good Health research review, a publications database sorted by thematic frequency and publication decades.

Dimensions and Definitions

Both the definition and attainment of good health are complex. In 1948, the World Health Organization (WHO) defined health as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (WHO 2016: 1). Nearly 40 years of research have revealed an array of benefits

resulting from the experience of nature in urbanized areas. Positive outcomes include recovery from disease (such as therapy and faster healing), as well as an improved state of well-being (including stress reduction, better learning and work productivity, and improved social dynamics in communities).

Moving from definition to causal pathways, the WHO (2015: 4) and other public health officials continue to identify "the conditions in which people are born, grow, live, work, and age" as the social determinants of health. The evidence of nature-based health response suggests that nature experiences are a social determinant, with important implications across social scales, from support of individuals to community cohesion to economic costs and benefits (Wolf and Robbins 2015). Based on research findings and emerging nature access programs, we propose three key questions for consideration.

How Might Recreation Contribute to Human Health?

Nearly 40 years of studies show that nature experience is an important determinant of human health.

For centuries, insightful people have commented on nature and wellness, wisdom that may be lost to many in our modern times. Declining physical and mental well-being, substance abuse, and increased obesity are disturbing trends in U.S. public health (Moody's Analytics 2017). Poor health comes at a tremendous cost for individuals, households, and communities. In 2016, for instance, across the United States, annual health services costs exceeded $3.3 trillion, about 18 percent of the nation's gross domestic product (USDHHS CMS 2018). But social determinants, including nature experience opportunities, can improve health and reduce costs.

Studies of nature and health have included small-scale experiments involving fewer than 50 people, as well as big data, cross-section evaluations of thousands of people conducted within multiple nations. Several recent research reviews have synthesized knowledge about nature and positive health outcomes, documenting that:

- There is conclusive evidence about key pathways: improved air quality, physical activity for health promotion, stress reduction, improved social contacts (Hartig et al. 2014).
- Brief nature experiences improve mental health and function, in both general health and clinical contexts (Bratman et al. 2012).
- Nearby nature is associated with improved birth weights in children, and multiple benefits for young people (Fong et al. 2018).

Assumptions about health benefits are embedded in recreation planning and programs. Given the scope of both public health issues and nature-based benefits, how might recreation professionals be more intentional about generating health benefits?

Recreation or Active Living?

Health benefits can result from passive encounters with nature, such as views of the outdoors from one's home, car, classroom, or workplace. Yet, a predominant theme in the research is the important role of physical activity (PA) in health response. PA is associated with reduced chronic disease, improved mental health, reduced cognitive and physical decline in elders, and increased social connections. Parks, trails, and gardens near residential areas are associated with higher levels of PA, and outdoor activity is shown to be more beneficial than indoor activity (Thompson Coon et al. 2011).

This evidence raises a key question for recreation planning. The term "recreation" implies, for many people, a leisure activity that is distinct in time and place from daily living. Recently, the health community has promoted the idea of "active living" to encourage physical activity that is associated with community design and daily lifestyles (Active Living Research 2018). The active living lifestyle includes walking or biking commutes to work or school, activity-based social gatherings, and intermittent exercise breaks while at work, as well as more extended recreation activities such as hiking and skiing (fig. 6.2). In addition, some occupations offer different types of nature exposure, which may have health benefits.

Guy Kramer

Figure 6.2—Public lands can support recreation and active living across wildland to urban places.

Figure 6.3 is a representation of nature-based activities across the entire landscape gradient. It is intended to prompt thinking about how to integrate the benefits of nature exposure into people's lives, from daily routine encounters to the occasional peak experience or adventure. As one example, local park systems are increasingly providing introductory or feeder programs to introduce urban and suburban youth to the outdoors, and to be the educational front door in community settings adjacent to federal lands.

The active living concept blends recreation with everyday physical activity as part of one's lifestyle.

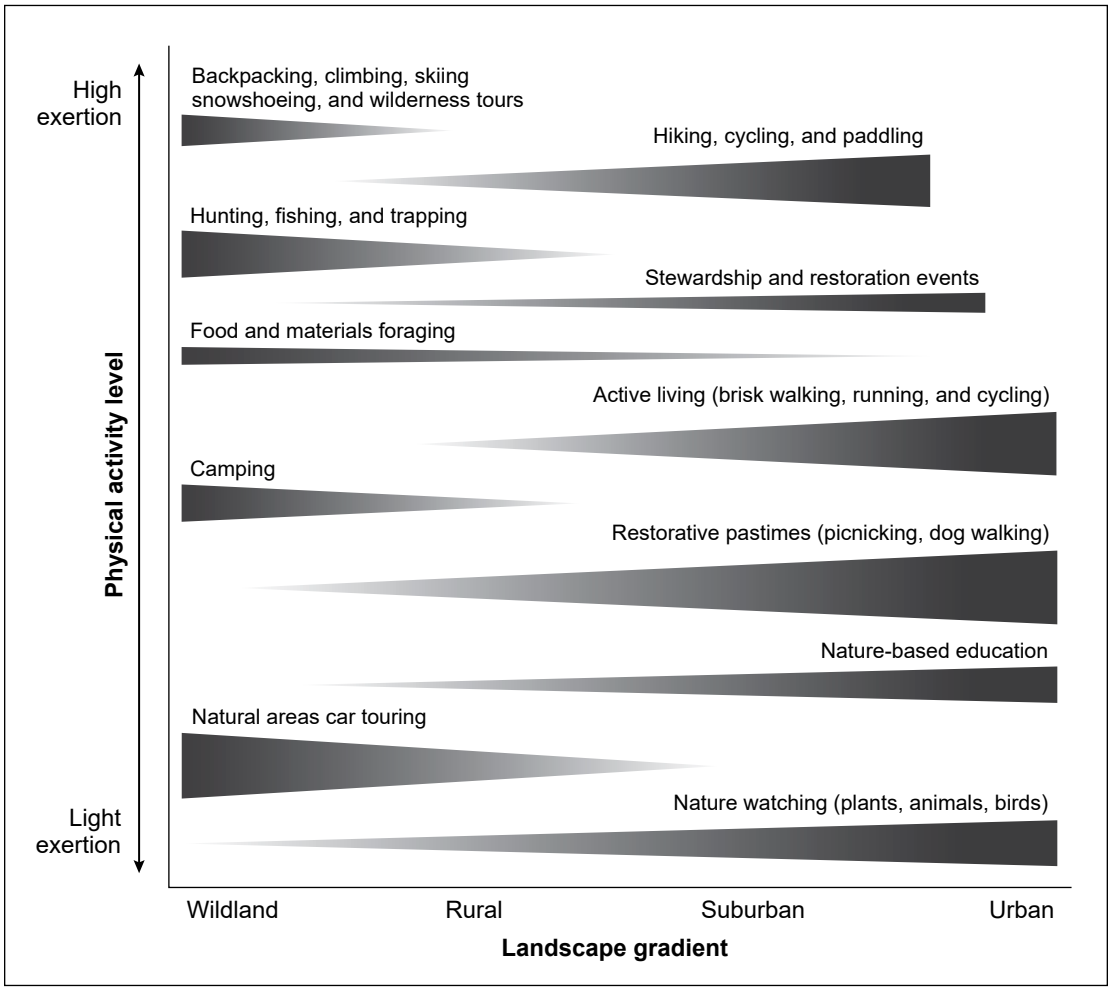

Figure 6.3—Nature-based activities that span the urban to wildland landscape gradient, considering level of exertion.

Human Health Across All Landscapes?

Our nation is becoming increasingly urbanized; more than 80 percent of the U.S. population now resides in cities and towns. At one time, the U.S. settlement pattern was in the form of urban centers surrounded by working landscapes and wilderness. The urban-wildland interface concept acknowledges that most American landscapes are now a heterogeneous blend of urban to rural conditions, with public lands interspersed within. Once distinctly separated from cities, many large, federal public lands are within or near growing metropolitan areas.

The combination of land use conversion, expanded road networks, and increased awareness of nature and health benefits suggests that public lands recreation should be viewed as one type of health-promoting opportunity along both a landscape and nature experience continuum. Rather than envisioning a visit to public lands as a distinct experience, managers are working with regional and local jurisdictions to plan and implement recreation and active living amenities across the landscape, from the urban core to the wilderness.

An outdoor activity for health outlook supports new programs and partnerships across landscapes and places.

Several major nonprofit organizations with a historical focus on working landscapes and wildland conservation, such as the Wilderness Society, The Nature Conservancy, and the Trust for Public Land, have initiated programs in urban communities. Interest in programs that blend ecosystem health and human health is shaping such efforts. In addition, some metropolitan areas have, or are creating, broad alliances composed of federal, state, and local agencies; public land managers; regulatory agencies; and nonprofit organizations to implement more seamless projects and programs across broad landscapes. Examples are the Intertwine Alliance (Portland, Oregon), the Emerald Alliance (Seattle, Washington), and the Metro Denver Nature Alliance (Denver, Colorado). Public health is a key interest, leading to participation by hospital systems and health insurers such as the Lone Star Family Health Center (Conroe, Texas) and Unity Health Care (Washington, D.C.).

Challenges, Barriers, and Opportunities

This section presents challenges and barriers, with a focus on opportunity.

Lifestyle Trends

Popular authors and scholars alike have observed the increase in sedentary lifestyles and screen time for people of all ages, both factors in disconnecting people from nature in the United States (and worldwide) (Kellert et al. 2017). The Mayo Clinic maintains that long periods of sitting create the same level of health risk as smoking or obesity (Laskowski 2018). The allure of technology is particularly strong for young people. Their growing affinity for smartphones, tablets, and the

like may provide opportunities to design and develop digital devices or applications that encourage more engagement with nature.

Spanning Disciplines

Public health officials focus on disease incidence and the epidemiology of illness. Physicians and other health care professionals are committed to quality diagnosis and treatment of health concerns. Government agencies are committed to environmental health, expressed by the vigilant search for and regulation of toxins and risks in communities. Professionals engaged in public and environmental health and land management are now expanding programs to embrace the salutogenic health effects of nature. Increased collaboration among green space and public lands managers and health professionals can assure more effective health promotion from recreation opportunities (Buckley and Brough 2017). Land managers often provide anecdotal stories of health outcomes from children's programs or wilderness therapies, but do not have the expertise or capacity to conduct analyses. Collaboration among health professionals and resource managers could lead to better planning for and analysis and documentation of health outcomes.

Equity

Many studies have identified disparities in the distribution of trees, parks, and gardens within cities. The general pattern is that underserved communities do not have the same quantity or quality of green amenities enjoyed by more affluent communities (Floyd et al. 2009, Rigolon 2016). Studies have also demonstrated that communities in greater need often respond more positively to the presence of green spaces, suggesting that nature has a mitigating effect in the face of the full range of social determinants of health (such as poverty, inadequate housing, and less access to education and jobs).

Equity may also be a challenge with regard to socioeconomic status and nature access outside the city. No matter where they live, people with limited time (e.g., because they are single parents or hold multiple jobs) or limited mobility (e.g., do not own a car) are less able to access public lands. To this end, a King County, Washington, program called Trailhead Direct works with local transit systems to offer transportation to visitor centers and trailheads. Feeling welcome and comfortable upon arriving can be another challenge (Ortiz 2018), and facilities traditionally oriented to White middle-class visitors may not have universal appeal. There are also opportunities to engage with nontraditional users to assess more culturally responsive amenities and to address potential negative cultural associations of forests and wild spaces.

Equity is important. All people should have safe and accessible outdoor activity opportunities.

Programs

New, innovative programs enable and encourage people to be more active and to engage with nature.

Early research on physical activity and city green spaces focused on proximity, that is, the distance between a residence and a park edge or green space. More recent and detailed studies have explored site facilities (ranging from ball fields to natural areas) and programming in relationship to use preferences of people of different ages and cultural backgrounds (Cohen and Han 2018, Cohen et al. 2016). Local organizations and agencies, recognizing this research and the broader evidence of nature and health, are launching a variety of nature-based programs that enable and encourage people of all ages to be more active and to engage with nature.

Table 6.1 presents examples of nature-based programs in the United States that promote human health outcomes. Some of the listed activities may not be regarded as traditional outdoor recreation, but they are becoming part of an expanded lifestyle orientation to being outdoors. There are opportunities for cross-programmatic learning and collaboration across the activities listed in this table. For example, wilderness therapy programs might benefit from integrating horticulture therapy into their practices. *Walk with a Doc* style programs could be adapted to become *Camp with a Doc*. There are opportunities for traditional recreation researchers to collaborate with urban planners specializing in active living policy and design to provide opportunities for leisure and transit across the spectrum of public lands, from urban parks and greenways to wildland and remote areas.

Stewardship

Across the landscape spectrum, and in most regions, increased use of public land exceeds available maintenance and management resources. Staff and budget appropriations rarely meet the needs of sustaining popular landscapes and developed recreation facilities. Many landscapes are in need of ecological restoration. Stewardship programs engage volunteers and paid workers in land care activities, and a few studies have explored the associated human health benefits for participants (Husk et al. 2016, Wolf and Housley 2017). There are opportunities to merge land stewardship programs with health-oriented programs. Recreation then takes on added purpose, providing a net benefit to ecosystems and favorite places. Outdoor recreation businesses (such as REI Coop)[2] can be engaged to promote, facilitate, or support such programs.

[2] The use of trade or firm names in this publication is for reader information and does not imply endorsement by the U.S. Department of Agriculture of any product or service.

Table 6.1—Health-oriented nature-based programs (U.S. examples)

Type of program	Examples of providers	Web address	Description (purposes, target audience)
Wilderness and outdoor therapy	Open Sky Wilderness Therapy	https://www.openskywilderness.com/	Wilderness and outdoor therapy programs are generally structured as expedition-style and water-based programs for teens, young adults, families, and veterans with social, psychological, and physical challenges.
	Warrior Expeditions	https://warriorexpeditions.org/	
	International Surf Therapy Organization	http://www.intlsurftherapy.org/	
Children's forests and nature connection	Children and Nature Network	https://www.childrenandnature.org	Various organizations are committed to creating the programs and spaces that support health-promoting experiences for children, including physical activity, mental health, learning environments, good nutrition, and disease prevention. Many include goals of connecting children to nature. Some have more of an explicit health mission than others.
	Forest Service Children's Forests	https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5387242.pdf	
	National Environmental Education Foundation Prescription for Outdoor Activity	https://www.neefusa.org/resource/rx-outdoor-activity	
Horticultural therapy	American Horticultural Therapy Association	http://www.ahta.org/	Horticulture-based therapy is used as part of physical and mental health treatments, using evidence-based healing approaches for individuals or groups undergoing physical/vocational rehabilitation, often in hospitals, nursing homes, and hospice care facilities.
	Therapeutic Landscapes Network	http://www.healinglandscapes.org/	
Forest bathing	Shinrin Yoku	http://www.shinrin-yoku.org/programs.html	Forest bathing programs provide guided wellness experiences centered on the benefits of immersive time in forests, including reduced anxiety, stress, and hypertension, and improved psychological mood (Li 2018).
	Association of Nature and Forest Therapy Guides and Programs	http://www.natureandforesttherapy.org/	
	International Society of Nature and Forest Medicine	http://www.infom.org/	
Healthcare provider/parks promotion	Park RX	http://www.parkrx.org/	Park prescription programs are designed to increase well-being by connecting medical professionals with land managers, and provide resources that help providers encourage patients to engage in physical activity in public parks and green spaces.
	Walk with a Doc	https://walkwithadoc.org	
	#Rx2Move	https://www.kpihp.org/rx2move/#sthash.gf2aGHl0.dpbs	
	Park RX America	http://parkrxamerica.org/	
Urban policy, planning and design for active living	National Complete Streets Coalition	https://smartgrowthamerica.org/program/national-complete-streets-coalition/	Urban policy and planning programs are designed to create, implement, evaluate, and share policies and practices that improve urban design to improve parks, address environmental equity, and create public spaces that encourage active living and active transit.
	Active Living Research	https://www.activelivingresearch.org/	
	Robert Wood Johnson Foundation	https://www.rwjf.org/en/how-we-work/building-a-culture-of-health.html	
	National Recreation and Parks Association	https://www.nrpa.org/	

New Conceptual Approaches

Duration and Dosage

Future research questions include "dosage," influences of outdoor experiences from wild to urban, and who benefits.

Authors and reviewers typically call for additional research at the intersection of nature and health (Frumkin et al. 2017). Public health officials are particularly concerned about the increase in chronic diseases that influence quality of life and illness across a person's lifetime. What specific nature benefits are afforded to people of different ages across the human life cycle, from children to elders? Most of the studies to date are cross section, or one-time measure studies, but research is now providing recommendations at the population level. Questions remain around application to public lands settings, such as what dosage is needed to initiate and sustain health benefits, including type of nature, frequency and duration of experience, and what are the unique needs of specific beneficiary populations (fig. 6.4)?

Guy Kramer

Figure 6.4—Walks and hikes promote health, but questions remain as to how long they need to be, and how often.

Landscape Context

Earlier, we suggested that public lands outside the city offer recreation experiences that are one expression or opportunity of active living. As nature's role in health research and programs expands, it would be valuable to understand the specific health benefits associated with experiences across an entire landscape and activity spectrum. How might brief nature experiences near home compare to peak experiences in wilder landscapes? As a metaphor, the public land experience might be the occasional feast, while daily nearby nature might be the routine of everyday meals. What are the respective benefits of each, and how do we make each more "nutritious?"

Biodiversity and Complexity

Recent studies in urban settings suggest that a heightened positive health response is associated with more biodiverse landscapes, but early results are inconclusive. These studies have focused on mental health outcomes (Carrus et al. 2015, Wolf et al. 2017). Although people may not recognize ecosystem biodiversity, they may be responding to comfortable levels of complexity in their surroundings, an effect long noted by environmental psychologists. Future research can continue to explore how healthy landscapes can promote healthy people.

Targeted Tharapies

Many people are aware of Ulrich's hospital study (1984), in which recovering surgery patients healed more quickly if they had a window with a view of trees. Some of the earliest and most recognized health benefits studies involved people with clinically diagnosed illness or disease and some form of nature therapy. Examples include treatment of depression, attention deficit hyperactivity disorder, and autism. There are also multiple nature-based veterans' stress treatment programs. Better defined treatment programs for specific illnesses might encourage health insurers and others concerned with rising health costs to financially support recreation resources and programs on public lands.

Measures and Metrics

Across all these questions and needs are opportunities to develop efficient and effective measurements. Carefully designed measures can help describe and verify health benefits for all visitors, including special populations. Having standard metrics can enable comparison of benefits over time within a single site or across multiple sites. Measures can be used to demonstrate benefits that are of interest to nontraditional organizations, in an effort to engage them as partners and political champions.

Economic Valuation

Finally, measures can be designed to inform economic values of benefits to support funding requests and to recruit health sector financial support. Up to 11 percent of total health care expenditures are linked to inadequate physical activity, some proportion of which could be saved if people were able to access more active living opportunities (Carlson et al. 2015). Few studies have explored the monetary value of nature-based health outcomes and even fewer have attempted to monetize increased physical activity (Buckley and Brough 2017, Wolf et al. 2015).

Compelling Questions

1. How are nature benefits experienced differently across the human life cycle, from children to elders? How can managers use these insights to promote benefits across age groups?
2. What is the dosage needed to initiate and sustain health benefits, including characteristics of the natural environment, frequency and duration of experience, types of physical and mental engagement in activities, and the unique needs of specific populations?
3. How do brief experiences of nearby nature compare to more distant peak experiences in more wild landscapes in terms of both therapeutic and general wellness health benefits?
4. Are positive human health responses more strongly associated with biodiverse and species-rich landscapes? Do encounters with conserved and restored ecosystems promote better mental and physical health?
5. How can nature-based therapeutic interventions be better defined and coordinated to encourage health insurers and healthcare providers to support or fund recreation programs, facilities, and resources for public lands?

Conclusions

Nature for health opportunities should include all landscapes. New collaborations can support landscape connectivity for active living.

The purpose of this chapter is to expand conceptions of recreation and leisure in future public lands research and to support a new paradigm proclaiming the importance of outdoor experiences as a social determinant of human health. This outlook is supported by an extensive research knowledge base that is expanding rapidly, with much of the science being conducted within urban contexts. Nature and health opportunities span the landscape gradient from urban to wild land, with recreation being but one facet of active living. Active living advances opportunities for frequent, accessible physical activity to promote human health. Planning and programming, across the entire span of nature-based activities, can integrate leisure and lifestyle, and include planning for equity, inclusiveness, and stewardship. The

nature and health arena is of increasing interest to the private sector (e.g., outdoor equipment vendors, health care firms, and health insurance companies); conservation groups (The Nature Conservancy, Wildlife Society, Trust for Public Land); organizations leading therapeutic programs, and local governmental jurisdictions. Shared interests in human health are leading to nontraditional collaborations between public health and public lands professionals. Researchers and practitioners might consider elevating goals of human health benefits and outcomes in lands planning and management to address the supply, demand, and need for nearby nature. Planning and investment for new parks and open space can incorporate strategic land assets and linkages, becoming health interventions where they are most needed across the landscape gradient.

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Chapter 7: Technology and Outdoor Recreation in the Dawning of the Age of Constant and Instant Digital Connectivity

Francisco Valenzuela[1]

Purpose

This chapter investigates the effects and potential of evolving technology, especially digital connectivity, on outdoor recreation managers, participants, and nonparticipants. My goal is to conceptualize and demonstrate the role of such technology in the context of larger cultural developments such as changes in values and in modes of experiencing the out of doors, the ways that these experiences are shared, and the management challenges they may bring to public agencies. Additionally, I will identify management and research strategies to leverage new and emerging technology to improve recreation management and sustainability.

Problem Statement

Rapidly evolving technology creates changes in the social context of outdoor recreation and affects the amounts and kinds of participation and potential recreation outcomes, including meanings and values that people attach to them. The management question is what the appropriate or best response of public land outdoor recreation providers is to such technology. There may be fundamental issues in how managers now understand the recreation experience, particularly the "wilderness or primitive experience," that may require a paradigm change. With the increasing diversity of users now constantly connected and consuming vast amounts of data and constant personal performance monitoring, the diversity of experiences and benefits may be changing.

Technological change creates new tools, skills, and methods that can be used to expand or enliven outdoor recreation experiences, as well as to accomplish such management objectives as facilitating recreation participation, improving communications, and protecting the environment. Public land managers need to understand how this technology can be leveraged to facilitate communications, collaboration, co-management, and monitoring to ease burdensome processes such as collecting fees, providing recreation information, and implementing regulations to achieve desired recreation experiences. Developments in digital interconnectivity provide both opportunities and challenges for researchers to better understand recreation use and values.

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Recreation managers and users have a long history of both responding to and adapting technology to better manage public lands or create opportunities for people to enjoy them. In a rapidly changing environment, managers find themselves responding to public pressure, often viewing these new technologies within the existing paradigm of outdoor recreation management, which often slows their adoption and results in reactive instead of proactive management. A proposed model of technological impacts on backcountry recreation found that technology influenced recreation participation in five interrelated categories—access and transportation, comfort, safety, communication, and information—all leading to increased recreation use (Ewert and Shultis 1999). If increased recreation use is the primary effect, this may lead to the conclusion that technology in the end is good for outdoor recreationists. This paradox of technology reflects a dilemma that grips many outdoor recreation managers, one that can be solved only with a different perspective on this issue.

Outdoor recreation occurs within the larger human social evolution now fueled by technological change. The understanding of technology as simply a useful tool misses the effect it has on human perception and understanding of the natural environment. Using modern technology to explore nature can frame nature as an object of research, to reveal the real as a standing reserve or a "recreation resource." Heidegger described this as "enframing" and the essence of modern technology (Heidegger 1977). Looking at satellite images of a forest or understanding location in terms of global positioning system (GPS) coordinates are new ways of understanding and interpretation, revealing aspects of nature outside of our normal senses. Specific place-based understanding of outdoor recreation experience and the sustainability of these places can through technology be thought of as not a living complex ecosystem but instead an understandable object to be redesigned to accomplish outdoor recreation purposes. This simplification a temptation for both the manager and the recreation user.

This technological human has been called a "cyborg," a cybernetic organism.

When technology creates new senses and abilities, and communication creates new modes of social thinking, technology then begins to change the nature of the modern recreation visitor. This technological human has been called a "cyborg," a cybernetic organism (Haraway 1985, Thompson 2015). Such cyborg users, linked by satellites and cellular towers to other users and to what in the past was a vast but unreachable source of outdoor information, paradoxically may feel less secure or may feel alienated from their own human senses and mental abilities. The use of GPS physically changes the activity of the brain, reducing the role of the hippocampi in creating internal maps of our environment and planning journeys to future possible destinations (Javadi et al. 2017). This has deep implications for one's ability to remember one's travels, and as our senses and cognitive abilities become

impoverished, to create greater dependence and resultant anxiety. This dependence has led users to make very poor and even fatal decisions as they are being led by the technology instead of their sense experience and cognition, resulting in what park rangers at Death Valley National Park called "death by GPS" (Milner 2016).

For some users, a hike is now fully monitored by a device that reports pulse rate, speed, time in motion, location, and instant comparison with others who have done the same hike or physical test. Such new technologically aided users are among those for whom we are now providing recreation opportunities. Electronic technology has been called total and inclusive. As McLuhan (1969: 49) observed, "Now man is beginning to wear his brain outside his skull and his nerves outside his skin; new technology breeds new man." The significance of this is that the experience of nature itself is now changing, and the old paradigm that the experience of nature is the result of unmediated direct experience needs to be questioned.

Dimensions of the Problem

As people's experience of nature is moderated, shared, and experienced through the use of digital technology, large changes may occur in the character of human connections to nature. The benefits of outdoor recreation activities and these changes need to be better understood. Most technological development in the recreation field has been focused on improving comfort using new materials and more advanced recreational vehicles to ease travel within public lands. Now the digital revolution has lessened barriers to communication and networking. Technology now provides a source of real-time information, potentially altering and expanding one's perceptions of the recreational experience by providing new affordances while presenting new challenges and opportunities for managers. Digital technology now allows for the creation of virtual or enhanced outdoor environments. The problem is that although digital communication may be changing the very nature of the human experience, we do not understand well what these changes mean to both recreation managers and users.

Technology creates new experiential opportunities. For example, there are no mountain biking experiences without mountain bikes, no snowmobiling fun without snowmobiles, and no scuba diving without scuba gear. Scuba diving, one of the most technologically dependent outdoor recreation activities, allow humans to experience the beauty of the oceans, their reefs teeming with life. Consequently, these activities can be enhanced by improvements in the underlying technologies. Managers then struggle with questions of compatibility or conflict with the natural environment or with other traditional users. Sometimes, this can become a moral

dilemma of great magnitude, such as whether mountain bikes should be allowed in the National Park System. The title of a paper about the issue, *The War for the Future: Mountain Bikes and Golden Gate National Recreation Area* (Rothman 2001), conveys the drama of this debate.

In the past, most technology challenges to public land recreation management came from new motorized and mechanical conveyances such as snowmobiles, all-terrain vehicles, and mountain bikes. Although these technologies are continuing to evolve (e.g., mountain bikes with battery-assisted propulsion), the smartphone represents a more significant agent of change. The iPhone™[2] was launched in 2007 (Farber 2007) as a combination of three devices: a "widescreen iPod™ with touch controls," a "revolutionary mobile phone," and a "breakthrough Internet communicator" (Cohen 2007). Roughly three-quarters of Americans now own a smartphone. Among younger adults, 92 percent of 18- to 29-year-olds own a smartphone. Twelve percent of Americans say they are "smartphone dependent" because they lack broadband Internet access at home, and smartphone reliance is especially pronounced among young adults, non-Whites, and those with relatively low household incomes. Nearly 7 of 10 Americans now use social media, which is especially popular among younger adults, as 86 percent of 18- to 29-year-olds are social media users (Smith 2017).

Although the business community has embraced this change and encouraged it as part of our consumer society, government land managers have yet to fully acknowledge this new environment. Smartphone users want and expect information to be provided when they need it in a form that suits their needs, and they want to network with others to share and gain even more information. The smartphone is a platform on which companies engage with users and communities, not just a communication tool (Schadler et al. 2014).

A smartphone is a tool that integrates a post office, camera, compass, map, guidebook, and GPS. A beautiful photo or video gone viral with a geolocation tag can create a recreation hotspot overnight. This instant overuse can be a serious problem because many recreation planning processes take years to implement, while environmental and social impacts begin to occur almost immediately. For example, visitation to Oregon's Tamolitch Falls, famously known as "Blue Pool," soared overnight after a posting on social media, but many new visitors were not seasoned outdoor people. Some were wholly unfamiliar with the hazards of wild environments, and fatal accidents resulted when the "pool" was misperceived to

[2] The use of trade or firm names in this publication is for reader information and does not imply endorsement by the U.S. Department of Agriculture of any product or service.

be something like a developed swimming pool rather than a frigid, dangerous section of the McKenzie River. Another consequence of technology is that some recreationists now feel overly safe. When they perceive their safety to be threatened, they can call for help at the least discomfort, even at times when help is not needed. A prime example was an incident in Grand Canyon National Park in which four backcountry visitors who thought their water source had a salty taste recklessly used their personal locator beacon to trigger three costly helicopter search and rescue operations (Pope and Martin 2011).

Visitors can now follow virtual trails, find virtual treasures, and chase virtual creatures. Virtual reality (VR) and especially augmented reality (AR) technologies are creating new ways for people to enjoy the outdoors either at home in the case of VR or in nature in the case of AR. Augmented reality is an interactive experience of a real-world environment in which objects are enhanced by computer-generated perceptual information. A number of AR applications and devices are now available to recreation users. As Jaron Lanier said of his HoloLens™, an AR headset made by Microsoft, "…the coolest thing to do with the HoloLens for me is to take it into the wilderness. Some people might be horrified—Oh my God, how could you take a HoloLens into the wilderness? But if you augment a forest and then take off the display, it pops into reality. It's an amazing palate cleanser" (Rubin 2017). It is likely that these two technologies, along with improved GPS navigation and other technologies, will create more senses, in the same manner that night vision devices allow people to see in the dark. New technologies may create more intimacy with both nature and other recreationalists through increased ability to share one's experience and deepen that experience. Combining technologies will create more immersion, for example, by being able to see through the eyes of a drone or moving back and forth in time, being able to visualize what was and what will be (Kelly 2016).

This kind of technology is potentially a double-edged sword. Some users may be satisfied by an indirect experience of nature that has been mediated by technology, often enhancing the drama and shortening the length of time "immersed" in nature and altering their perception of what is real (Shultis 2001). As in commonly oversaturated digital photography in which our view of nature is enhanced, we cannot directly experience that saturation with our eyes.

The direct experience of nature usually begins with the five human senses of first-person perception of the natural environment (Merleau-Ponty 1962). Once that first-person perception is mediated through technology, the actual experience of nature can become profoundly changed. Perceptions of both time and space can be altered. This could lead to enhanced recreation experiences of a new reality, bringing about a deeper comprehension of one's understanding of natural environments

and relationship to them or an entrancing world of brighter colors and phantom creatures unmoored to the natural world.

Sustainable recreation focuses on building a sustainable relationship between humans and the nonhuman world. This relationship is one of enjoyment, love, appreciation, and stewardship. The relationship is reciprocal in that the ecosystem benefits enjoyed by the visitor are repaid to the nonhuman world through actions that sustain those communities. Well-being is one of the clearly documented benefits of being in the outdoors (Wolf et al. 2020) and is based on how humans connect with nature though knowing, perceiving, interacting with, and living in these natural communities (Roly et al. 2013). The concern is whether technology deepens these connections and helps visitors better enjoy these benefits of physical and mental well-being or if technology itself becomes the focus of the recreation experience and even replaces nature as some believe is already happening (Kahn et al. 2009). Rock climbing gyms provide much enjoyment to their users and for many is now a total substitute for the fickle outdoors, but is it really better for their well-being than climbing outside? Today, for many users of these facilities, they have transformed an outdoor recreation activity into an indoor sport, like any indoor sport that has no direct tie to outdoor recreation. Are the wild climbing areas better off with fewer visitors who may not stand up for these areas when they are proposed to be turned into economically valuable quarries? Indoor skiing and surfing are now possible as well; there may be a trend toward turning outdoor recreation into indoor recreation though the construction of built environments.

Barriers and Challenges

These changes are engendering debates about appropriate technology as well as conflict between traditionalists and the new generation of users. There are serious philosophical concerns that the benefits from wilderness recreation in developing virtuous character and our ability to live a good life will be lost if we fail to practice responsible simplicity when recreating in the backcountry (Pohl 2006). There is debate regarding whether technology improves the recreation experience and whether it facilitates or worsens management (Pohl 2006, Shultis 2001). One disturbing conclusion is that the growth of technology will bring about the end of the true wilderness experience (Martin and Wagstaff 2012).

The limited research in this area seems to indicate that technology is a mostly positive addition that may improve visitors' recreation experiences (Gimple 2014, Lindell 2014). However, some managers are concerned that it represents a threat to wilderness (Borrie 1998, Wilderness.net 2017). The greatest challenge may be a generation gap among recreation managers that prevents senior managers from understanding the magnitude of change; if they see technology as a threat rather than an opportunity, they may fail to adapt to it. When a wilderness hiker uses a

smartphone to get the latest weather information or network with others, it changes the recreation experience. But whether this is a good or bad development is not clear. The current situation is that some recreation managers cannot see a silver lining in this new world (Martin 2017).

The other barrier is how the wilderness experience itself is conceived. For some users, wilderness is the "other," in direct contrast to urban spaces, and is a place that lacks technology. In such a place, a user must be self-reliant, an idea that dates to Euro-American settlement of the of the American West. That degree of self-reliance most likely ended decades ago, although some wilderness managers still struggle to revive it. Technology held in one's hand cannot, as some claim, threaten the wilderness, but it can threaten the wilderness experience if we continue to define the wilderness experience as a lack of technology. The best example of this is the e-bike, a bicycle assisted by an electric motor. Recreation planning/conceptualization systems like the Recreation Opportunity Spectrum (ROS) explicitly divide the recreation experience into motorized versus nonmotorized settings to reduce conflict and enhance the range of recreation experiences (Shilling et al. 2012). The e-bike breaks the paradigm by being a motorized vehicle with no visible motor or motor sound. So, conflict now becomes not a conflict based on blocking goal achievement or not wanting to see, hear, or smell an internal-combustion engine, but purely ideological, a conflict over differences in social values (Vaske et al. 2007). Evolving social values is a challenging area for managers to work in. For recreation planners, the binary choice of motorized versus nonmotorized may no longer be so useful. These mental models block us from imagining a technology-enhanced wilderness experience.

For recreation planners, the binary choice of motorized versus nonmotorized may no longer be so useful.

Consequently, there is a great deal of uncertainty not only about the consequences to visitor experiences from technology, but how public land managers should respond to these consequences in recreational settings. The lack of knowledge regarding how to respond may create a sense of justifiable paralysis for decisionmakers. This may be partly a result of the lack of a vision, clear roles, or experience objectives, as they relate to how we have conceptualized some recreation settings in the past as modern technology-free zones. Technology—particularly communication, information, and media technology—is now converging and is strongly linked to freedom of speech rights protected in the United States by the First Amendment. This linkage makes the managers' ability to take action that limit the use of these forms of technology extremely limited.

The role and challenge of recreation managers may be not to protect individuals' recreation experiences from their own technology, but instead in some settings to protect one set of users from the technology being used by other groups. Managers can use technology to help people experience the world in different ways and to care about the natural world and protect their public lands.

New Conceptual Approaches

We can use the new technological environment stored in the cloud to research the real activities, recreation use, values, needs and benefits visitors seek by studying the statements and queries people make on a daily basis. This includes the use of big data and research into network information flow (Stephens-Davidowitz 2017). There is also a rapid increase in research that examines or estimates visitor use patterns in parks and protected areas using data and geotagged photos shared on social media platforms such as Flickr and Instagram (Tenkanen et al. 2017).

We can also embrace these advances in technology, because this cultural change is a given and focuses on leveraging technology to create community and a platform for engagement with public land managers. In other words, we can evolve and adapt to the changing environment instead of resisting it, using social media and reviews to better engage with recreation users. We live in a time when many of our sociocultural and ecological systems are unraveling. The complexity of this environment makes the future very difficult to predict. In this chaotic environment, we should consider approaching change from the same perspective adopted by the U.S. Department of Defense, one characterized by the acronym VUCA (volatile, uncertain, complex, and ambiguous) (Kohl and McCool 2016). We can use the power of digital media to achieve management objectives. Technology really has two distinct influences on sustainable recreation: the first relates to how people connect to the land, and the second to how the agency can collect data for research and management. The second can be as simple as counting visitors and monitoring change (for which techniques are being developed), or gathering more qualitative data-like preferences (Fisher et al. 2018, Sachdeva 2020).

This new experience set, enhanced via both onsite and virtual technology, could help transform people into citizen conservationists (Miller et al. 2020). The path could be to encourage and engage with technology that enhances people's connection to the real world instead of alienating people from it. Managers should also begin discussions about individual choices regarding technology and its use, and in some cases the voluntary simplicity and the benefits of forgoing technology to build one's sensitivity and awareness of place.

Another area to pursue is researching the effectiveness of place-based websites that invite people to upload comments related to their experiences. For example, the Chugach National Forest has a "Stories of the Sound" website and a number of Facebook pages. The Forest Service's "Talking Points" program allows people to upload comments related to specific management issues, conflicts, and needs regarding national forests and grasslands as well as other public lands.

The use of enhanced representations of reality can help address the problem of "landscape amnesia." The baseline perception of what should be deemed natural, healthy, or desirable is shifting with the generations. Landscape change is often such a slow process that our temporally limited perception is not able to make well-reasoned judgments about what constitutes desirable or acceptable conditions (Diamond 2005, Wuerthner 2008). Using VR and AR technology, simulations could be made that allow the public to see what the landscape looked like 200 years ago, well before the collective impacts of timber removal, overgrazing, fire suppression, and invasive species—or to look 200 years into the future after a forest treatment. This simulated time travel could also include human cultural elements that include the built environment.

Recreation design including desired conditions in natural settings and in specific locations could also benefit from human-computer interaction. Computers could help support positive relations within ecosystems and recognize the limits of technical control and how natural features and process can "talk back" within the contexts of social construction and interaction. Recreation planners could help reveal the consequences of interactions with nature, allowing participants to experience a heighted awareness of the effects of agency and visitor action as an intrinsic part of the world. These simulations could even be done from the perspective of other actors such as natural features and wildlife and help planners and the public alter or expand their experience of place and habits of perception by creating situations that combine scientific models and felt life experiences (Bidwell and Browning 2010).

Technology has cognitive affects, social implications, emotional outcomes, and even ethical consequences.

Education is needed in our digital age. It is important to knowwhen to use technology and when to avoid it. Technology has cognitive affects, social implications, emotional outcomes, and even ethical consequences. There should be ongoing dialogue, and in some cases education, to help visitors make good decisions about technology and even to overcome the increasingly common condition of technology addiction (Yamamoto and Ananou 2015). We can use social media to start this dialogue about appropriate technology and individual restraint to help gain important recreation benefits and reduce conflict with others.

Compelling Questions

1. How does management take new technology into account and then use this technology to enhance visitors' connections with nature and place-based stewardship?
2. What new quantitative data collection methods can be developed that use the data-rich technological environment to research the activities, economic value, and levels of recreation use?

3. What new qualitative data methods exist that can anticipate changing values, needs, and benefits that visitors are seeking and how people connect to the land?
4. How can social media be mined for new quantitative data methods that take advantage of the growing use of geotagged photos shared on social media platforms such as Flickr and Instagram?
5. How can land managers effectively use technology to create community and as a platform for increasing citizen engagement?
6. How can recreation satisfaction monitoring be replaced by methods that use social and other digital media, including reviews?
7. What new technology allows public land managers to crowdsource much of the data now being gathered by employees? This includes natural resource conditions, built facilities condition, visitor satisfaction and preferences, evaluation of management actions, and prioritization of place-based recreation benefits.
8. How can managers anticipate and mitigate the impacts to outdoor recreation resulting from new technology and social networking?
9. How do we engage with the commercial development of technological tools to help citizens be better stewards of the environment while recreating in the outdoors?
10. What policies do we need that consider the legal environment and ethics of accessing or requesting information from GPS, social media platforms, and other personal information and smartphone apps in natural areas?
11. How should existing planning frameworks for wilderness management or the ROS framework consider the effect of digital technology and connectedness on the primitive recreation experience?

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Chapter 8: Public Lands, Tourism, and Community Connections

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> Though we travel the world over to find the beautiful, we must carry it with us or we find it not.
>
> —Ralph Waldo Emerson

Purpose

Public lands and protected areas play an integral role in regional economic development—a connection often overlooked in the United States. This chapter makes the case for devoting greater attention to the role of public lands as a generator of regional tourist activity, and points to the opportunity for public land managers to collaborate with tourism industry providers, tourism promoters, and regional planning entities to ensure sustainable tourism growth.

Public lands visitation provides benefits to gateway communities in the form of jobs, expenditures, and new business development, while visitation fees often are used to support conservation goals. Parks, forests, monuments, and refuges are attractions that provide a venue for people to enjoy natural amenities and for tourism providers to earn a living facilitating these outdoor experiences. Greater acknowledgment of the economic impact of public lands visitation may help to expand support for their continued management. Tourism growth associated with public lands also can result in changes to nearby communities and put pressure on existing infrastructure. Yet, decisionmakers are not always cognizant that changes in agency policy or specific management actions can potentially affect a broad array of tourism enterprises, as well as communities dependent on the tourism industry. Sustainable tourism planning aims to minimize negative economic, social, and environmental impacts, while addressing needs of visitors, the industry, and host communities now and in the future (Mowforth and Munt 1998). Public lands add value to a regional destination and are often marketed to prospective travelers by tourism promoters and industries. Yet, not all public land managers fully acknowledge that the land they serve is part of a global tourism network, nor do they have access to current tourism industry data to allow for proactive planning. Planning

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and management of public lands would be enhanced by collaborative engagement from regional tourism entities and enterprises who depend on public lands.

Problem Statement

Tourism can be an important economic development opportunity for rural communities that serve as gateways to parks, forests, reserves, and protected areas.

Tourism can be an important economic development opportunity for rural communities that serve as gateways to parks, forests, reserves, and protected areas. In resource-rich regions, tourism can augment existing economic activities, such as farming, cattle grazing, or logging, and become a primary source of employment. For example, the Olympic Peninsula of Washington was formerly among the largest timber-producing areas in the United States in terms of volume, and local communities depended on jobs in logging and mills. In 1981, Olympic National Park was declared a United Nations Educational, Scientific, and Cultural Organization World Heritage Site. In 2018, the park received 3.1 million visitors who came to experience its temperate rainforest and dramatic wilderness coastline. New guiding enterprises, accommodations, and retail enterprises have been launched. Although economic benefits from tourism may help sustain local communities, proximity to public lands and protected areas can be associated with inmigration and can introduce enduring social changes that are not always welcome. Natural resource agencies play an important role as providers and caretakers of treasured natural and cultural destinations, yet the critical position of public lands in the tourism system is not always fully acknowledged or well understood. We suggest that new thinking, new research, and incorporation of sustainable tourism frameworks can help land managers to embrace their role as a tourism provider in ways that will result in better economic, environmental, and social outcomes. In addition, there are opportunities for greater coordination between agency officials, tourism providers, marketers, and planners to explore regional sustainable tourism as a form of rural development with greater intentionality.

As was noted in chapter 4 (Armstrong and Derrien 2020), language is powerful and shapes the way we consider and frame the world as well as the position of ourselves and others in it. An important distinction between the concepts of "outdoor recreation" and "tourism" requires further elaboration. "Outdoor recreation" is a term primarily used in North America and a few other industrialized regions. The term encompasses leisure (free-time) activities that occur in a natural or outdoor setting, and the positive experiences that these activities generate (Moore and Driver 2005). This concept draws our focus to the nature of the outdoor activity (e.g., hiking or skiing), to the benefits of the activity to the recreationist (e.g., fun or relaxation), and to interactions of visitor use with the environment. Outdoor recreation management involves "providing opportunities for satisfying

outdoor recreation experiences while sustaining the health and integrity of the natural environments on which these opportunities depend" (Moore and Driver 2005: 17). Management of outdoor recreation appears less concerned with how people traveled to public lands, what services they relied upon, or where they came from (local or nonlocal), and is more focused on what they do after they arrive and on how to minimize harm to the natural or social environment. However, in this report and elsewhere, the concept of outdoor recreation is being reconsidered (Blahna et al. 2020a).

Whereas outdoor recreation focuses on leisure and nature-based settings, tourism is a broader concept that includes travel for both pleasure and business. According to the United Nations World Tourism Organization,

> Tourism is a social, cultural and economic phenomenon which entails the movement of people to countries or places outside their usual environment for personal or business/professional purposes. These people are called visitors (which may be either tourists or excursionists; residents or non-residents) and tourism has to do with their activities, some of which imply tourism expenditure (UNWTO 2008: 1).

This definition refers to an entire system of interactions and transactions that involve a traveler (or visitor), a set of activities being undertaken by the traveler, an array of tourism intermediaries who facilitate the travel, the host community and local hospitality venders, travel agents, and the interconnected systems of transportation that result in travelers arriving at destinations, which include public lands. In other words, the concept of tourism reflects the industry, visitor activities, visitor experiences, and network of entities that support the trip. In the context of public lands management, tourism emphasizes the connections and market interactions among actors involved in the production and consumption of natural and cultural heritage. Land managers and policies in the United States traditionally revolve around the concept of classic outdoor recreation within localized use contexts (and management jurisdictions), as opposed to tourism and regional, national, and international use contexts. We assert that by not considering public lands visitation in the context of a tourism system, public land managers are overlooking important connections and opportunities that allow for more proactive and informed land management.

Greater attention to measuring the benefits of public lands visitation may help create a stronger case for their ongoing management, in lieu of declining capacity. Protected areas such as national and state parks, forests, grasslands, refuges, and monuments are primary destinations in the United States, catering to both local

users and travelers, with benefits to the regional and national economy. Outdoor recreation accounts for 2 percent of gross domestic product in the United States (USDC BEA 2018). In 2016, an estimated 889 million recreation visits were made to federal lands, generating $49 billion in visitor spending (Cline and Crowley 2018). Collectively, U.S. state parks drew 791 million visits in 2016 (Leung et al. 2017). Nonlocal visitors to protected areas generate new income and employment for gateway communities. Expenditures associated with park visitation represent a revenue source for regional businesses, including hotels, restaurants, transportation, retail suppliers of gear and equipment, and outfitting and guiding services (White et al. 2016). Although research has shown that tourism may not be a panacea, the industry can augment other economic sectors and provide seasonal and year-round employment opportunities (Briedenhann and Wickens 2004). The economic value of visits to parks and protected areas for nearby communities is beginning to be more fully appreciated.

Public lands are often at the center of regional tourism promotion efforts, yet many public land managers are missing potential opportunities to partner with tourism providers, industry officials, and regional tourism promoters.

Public lands are often at the center of regional tourism promotion efforts, yet many public land managers are missing potential opportunities to partner with tourism providers, industry officials, and regional tourism promoters. Working in concert, public and private entities can create a pathway toward sustainable tourism that protects the environment and provides opportunities for local communities. We argue that a systems-based perspective to understand tourism in the context of public lands will shed light on new relationships and change the way we think about, plan for, and manage visitation to parks, forests, and other protected areas.

Barriers and Challenges

Traditional recreation management has emphasized the development of a range of outdoor settings that provide for associated recreation opportunities leading to diverse visitor experiences. Planning for outdoor recreation typically occurs with consideration of visitors after they set foot on public lands. In contrast, a systems approach considers public lands visitation within a regional and global framework. Only recently has public agency recreation management been concerned with aspects of visitor demand, recognizing changing demographics, consumer trends, market segments, and niche outdoor experiences that shape visitor expectations. Similarly, state and local tourism agencies devote considerable resources to destination marketing rather than collaboration centered on destination management. More investment from tourism promoters on collaborative processes, partnerships, and stewardship of the public lands could strengthen a region's ability to support visitation. Viewing tourism as a developmental activity has rarely been an aspect of managing visitors on public lands. The lack of this view has resulted in plans and

actions that have no vision as to what the object of development is or what it is that tourism should sustain.

An example of the need for tourism-based land management includes the lack of consistent focus on factors that contribute to shifts in visitor's demand, which can contribute to agencies being unprepared for changes in visitation levels or consumer needs. Meanwhile, local businesses, visitor bureaus, economic development entities, and tourism promoters are often linked to broader tourism networks and share responsibility for generating visitor interest and directing people to natural attractions (which may or may not be consistent with agency intent or capacity).

In the context of public lands management in the United States, there has been considerably less attention placed on understanding elements and dynamics of the global tourism industry or structural aspects of the tourism system. This includes the role of local and nonlocal entities in shaping patterns of tourism growth for nonmarket goods and services (i.e., recreation opportunities, nontimber forest products) (Cerveny 2008). In most other parts of the world, tourism is integral to the establishment and overall management of protected areas, because visitors are often needed to finance conservation (Eagles et al. 2002, Leung et al. 2018). This difference in perspective is partly due to the legacy of most of U.S. public lands management being linked to extractive industries such as timber, for which we now have a wealth of information, as opposed to outdoor recreation and tourism. As extractive industries continue to decline in economic viability, and tourism continues to grow, many land management agencies will consider a fundamental reappraisal of how they manage these multiple uses.

Tourism and visitation to public lands can cause challenges for gateway and neighboring communities. Changes in social identity, socioeconomic structure, demographic composition, power relations, quality of life, and aesthetics associated with tourism expansion have been well-documented (Andereck et al. 2005, Cerveny 2008, Smith and Brent 2001). The tourism industry can generate a new group of tourism entrepreneurs and seasonal workers to communities, shifting social dynamics. Success stories exist, such as Leavenworth, Washington, a former logging community where a citizen coalition convinced the city to remake their community with a Bavarian motif to encourage tourism (Frenkel and Walton 2000). Still, numerous case studies depict rural communities wrestling with dramatic changes associated with tourism growth, such as an influx of guests, tourism entrepreneurs, and outside corporations; with commoditization of their community or heritage; or with tourist encounters in areas once considered "local," such as neighborhoods or favorite hiking trails or fishing holes (Sharpley 2014). These

issues can be exacerbated when agencies and stakeholders in the tourism system are not engaged in coordinated planning and management. Understanding the social impacts of visitor use on public lands to neighboring communities—coupled with a commitment to professional recreation and tourism planning—is an important role of public agencies. A commitment to understanding the benefits and undesirable consequences of tourism has led to responses on the part of land managers, such as the broader trend toward introductory visitor facilities (e.g., visitor centers) in local communities, such as at Grand Staircase–Escalante National Monument in Utah or Channel Island National Park in California.

Agency officials would benefit from recognizing their role in the tourism system and developing linkages with local and nonlocal tourism entities to plan for tourism in a way that is consistent with the agency's vision.

Agency officials would benefit from recognizing their role in the tourism system and developing linkages with local and nonlocal tourism entities to plan for tourism in a way that is consistent with the agency's vision; that does not exceed agency capacity to manage resources; that is economically, socially, and ecologically sustainable; and that provides access to all. Figure 8.1 provides one generic depiction of the elements of the tourism system in the context of public lands. The figure shows how multiple institutions play a role in shaping the volume and character of protected area tourism and those stakeholders concerned about its implications.

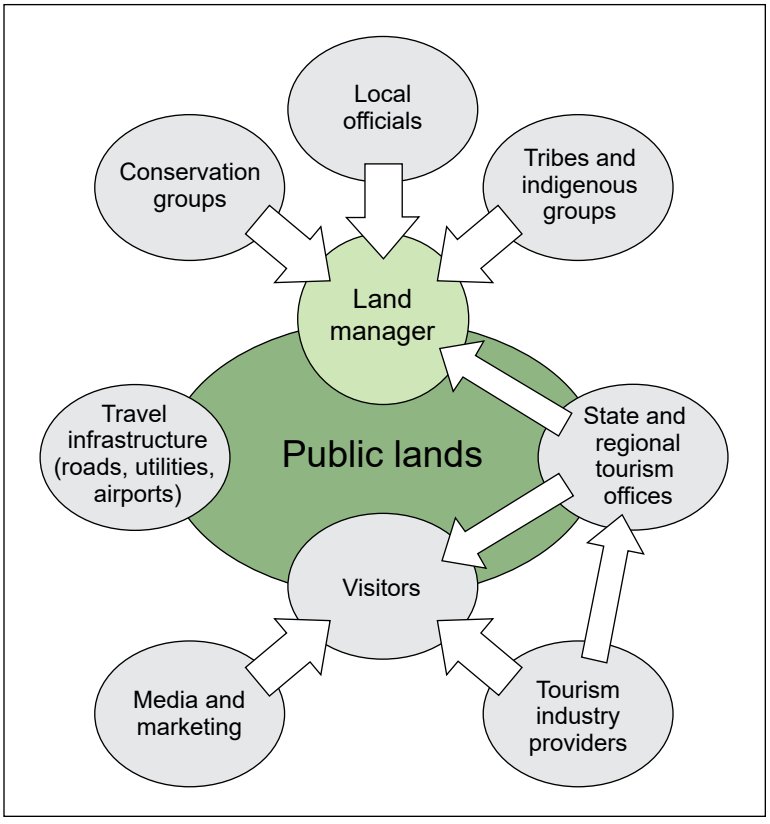

Figure 8.1—Tourism system for public lands management. Public land managers are influenced by many local and regional stakeholders. Meanwhile, nonlocal and local industry promoters can influence the volume and characteristics of visitors through promotional efforts. Transportation infrastructure also affects visitor flow and volumes. In planning and managing for recreation on public lands, this complex array of tourism actors is not always considered.

Greater engagement with the tourism system is reflected in more stewardship-based tourism marketing like the new "Leave No Trace" partnership with the state of Colorado, or direct investment in public lands, such as the grant-making and destination development programs administered by state tourism offices in Indiana, Montana, Oregon, and elsewhere. Other examples of more proactive and engaged tourism planning can be found in destinations with strong public-private partnerships, multiple jurisdictions, and a regional focus, such as the Columbia River Gorge National Scenic Area.

Some of the barriers might be related to deeply embedded notions about the role of people on the landscape. U.S. public land managers historically have been trained to focus on stewardship of their land base, providing access to visitors while emphasizing management of other resources (fish and wildlife habitat, water quality) or commodities (timber, minerals, rangelands), depending on agency mission. In the traditional view, people are often viewed as a disturbance factor, and their presence requires managers to mitigate their impacts and protect valued resources. As noted in chapter 1, this deeply embedded notion of humans as "anthropogenic factors" would affect how some land managers respond to nature-based tourism—an entire industry explicitly devoted to marketing outdoor experiences and connecting people with public lands. This may be compounded with biased perspectives of some public servants toward commercial enterprise in particular sectors, such as retail trade or services, versus tangible commodities like timber or minerals.

Other institutional lenses inhibit full appreciation for the role that public lands managers play in shaping the tourism system as well as the collective response that tourism providers, promoters, and players in the tourism system have on shaping the number of visitors who arrive and the types of experiences they seek. Below are five key barriers to implementing a systems-based sustainable recreation and tourism strategy on public lands:

- An agency predisposition to managing for protection of ecosystems and resources, with less attention to human connections, including recreation, cultural heritage, livelihoods, and other connections to public lands. A more balanced and interactive relationship between resource protection and recreation land use would help (Blahna et al. 2020b).
- An historical "supply-side" approach to managing resources and visitors (recreation settings) once they arrive on the park/forest without recognizing the factors that lead to increases or decreases in visitor demand for natural amenities, consumer (visitor) activities and technologies, and particular experiences (which are often generated by the media).

- Historical hesitancy to embrace commercial tourism enterprises, such as outfitter-guides who secure permits to bring groups into forests and parks, as critical partners in providing outdoor recreation programs and services. Shared language and concepts for land managers and planners to discuss tourism and mediated visitor experiences would help address this gap.
- Capacity constraints (personnel and budgetary) that limit opportunities for partnerships around recreation and tourism at the local and regional level. Although this is changing, there is a relative lack of well-established collaborative forums or deep relationships between land managers and tourism providers at local, regional, or national scales, compared to groups engaged in ecological restoration, fire management, or other land management activities.
- Overemphasis on jurisdictional boundaries, specifically that agency concerns have ended at the boundaries of the agency. Hesitancy to engage stakeholders who operate beyond their jurisdiction has encouraged managers to minimize tourism as a regional issue that is relevant to their operations.

Addressing these embedded values and biases may require a paradigmatic shift in the way that public lands are conceptualized, managed, and funded, as suggested in chapter 1 of this report.

New Conceptual Approaches

New approaches may help to clarify the role of public lands in the tourism system and to identify an array of tourism actors and institutions that are implicated when visitation to public lands expands or contracts. New research on the sociology, economics, and geography of tourism can accompany these efforts.

Systems approach—
A social-ecological systems (SES) approach can help identify actors and institutions involved in tourism to parks, forests, and protected areas and reveal the dynamic interactions among these entities. McCool and Kline (2020) expressed the need to conceptualize, plan, and manage in the context of a dynamic system that recognizes emergent properties and pressures. Anderies et al. (2004) developed a framework for understanding institutions in the SES that cooperate and have the potential for collective action. Their model includes a configuration of resource users and public agency providers interacting with the resource itself and the public infrastructure that supports resource use. A systems approach is useful for perceiving how policy, regulation, markets, and infrastructure can affect the flow of visitors to and from public lands as well as patterns of resource use once they arrive. A systems approach to understanding tourism and its connection to parks and protected areas would allow a more holistic view of recreation and tourism (Baggio 2008, Eagles 2009, Plummer and Fennell 2009).

Measuring benefits of recreation and tourism—
National forests, parks, and other public lands provide several benefits (e.g., recreation opportunities, health, water quantity and quality, erosion control, and biodiversity) to individuals and communities that are not always considered when evaluating investments in and tradeoffs associated with land management strategies. Greater attention to measuring the benefits of public lands visitation may help create a stronger case for their ongoing management, in lieu of declining capacity. It is necessary to determine both the use and non-use values of public lands to promote efficient land management strategies. Some use values can be directly identified by market transactions (e.g., land prices and entrance fees). For other nonmarket uses (e.g., hiking, birdwatching, and photography) and non-use values (e.g., knowledge of existence or that resource and opportunities are being passed on to future generations), resource economists use techniques such as the travel cost method (Parson 2017), hedonic pricing (Taylor 2017), contingent valuation method (Alberini and Kahn 2006), benefit transfer (Johnston et al. 2015), and more recently, the choice experiment method (Louviere et al. 2000) to estimate the monetary values of environmental goods and services. Sánchez et al. (2016) used an online survey of wilderness visitors with the travel cost model to estimate the losses for closure of hiking sites during a season (ranging from $29,000 to $2.9 million) in the San Jacinto Wilderness, San Bernardino National Forest. Rosenberger et al. (2017) estimated recreation economic values using the benefit transfer method based on the updated Recreation Use Visitor Database (Loomis 2005, Rosenberger and Loomis 2001). The authors provided information to estimate the recreation economic values of different recreation activities for each national forest. One study by Sims et al. (2018) used the benefit transfer method to estimate the health-related cost savings resulting from physical activities from open space for Tennessee's Cumberland region. They found that total health-related cost savings to be $466 million per year from physical activities on open space.

Nonmarket values associated with recreation and tourism, such as improved health and well-being, sense of place, cognitive growth, and stewardship, are often acknowledged, and work is being done to better account for these benefits by using models such as ecosystem services. Cultural ecosystem services are the "non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences" (MEA 2005: 5). Cultural services have proven difficult to define and measure, but scientists have begun to develop frameworks that are meaningful to public land managers and show the diverse benefit of public lands to people (Bryce et al. 2016, Plieninger 2013). This can been seen in a number of recent publications that focus on outdoor recreation and health outcomes (Thomsen et al. 2018). Information of the benefits

and monetary values produced by national forest, parks, and other public lands can potentially assist land managers in evaluating potential tradeoffs when making resource management and planning decisions.

Stakeholder and social networks—
The use of both stakeholder analysis and social network analysis may be useful to help recreation planners and land managers identify entities that play a role in recreation and tourism within a particular geographic region (Prell et al. 2009). Stakeholder analysis involves the identification of entities (e.g., local hospitality industries, outfitter/guides and other permit holders, transportation agencies, travel bureaus, state and municipal economic development groups, user groups, citizen groups, and environmental groups) who have an interest or "stake" in how public lands are managed (Waligo et al. 2013). Using this approach, all relevant entities are identified, the impact of proposed projects or actions are assessed, and their roles, access to knowledge, resources and capabilities are evaluated systematically. Social network analysis can be used to assess the relationships, affinities, and communication patterns among organizations (Scott 2017). Researchers have used social network analysis to build conceptual models of regional tourism and recreation networks to understand how to build coalitions, structure communications, and engage in collaborative planning (Scott et al. 2008).

Global tourism trends—
Recent research assessing the global tourism industry should be viewed as a resource for land managers (Buhalis and Costa 2006, Conrady and Buck 2007, Theobald 2005). Studies on tourism markets, consumer trends, sector analysis, regulations, finance and banking, immigration and border policy, and other aspects are helpful in understanding how visitors may arrive in destinations and their expectations once they set foot on public lands. In Alaska, for example, cruise ships are the primary source of visitors to parks, forests, and protected areas. Therefore, changing dynamics in the cruise industry can have significant impacts on recreation patterns (Cerveny 2008). Some work has focused on industry factors related to sustainable tourism (Eagles and McCool 2002, Eagles et al. 2002, Harris et al. 2002), but more study is needed with an updated view on changing dynamics. This lack of consistent focus on factors that contribute to shifts in visitor demand can result in agencies being unprepared for changes in visitation levels or consumer needs. New guidelines for visitor management in protected areas are being developed that encourage consideration of sociocultural, economic, and resource effects of tourism development (Leung et al. 2018). For a discussion of changing dynamics of international tourism on U.S. public lands, see Helmer et al. (2020).

Knowledge of industry dynamics would help resource managers become proactive in management, allowing them to anticipate trends and mitigate challenges associated with increased visitation or diversifying uses. Agency decisionmakers would benefit from regular publication of data visitation trends, industry trends, market conditions, and consumer product information that would help to inform their understanding of who might be coming to public lands and what they desire from their outdoor experiences.

Knowledge of industry dynamics would help resource managers become proactive, allowing them to anticipate trends and mitigate challenges associated with increased visitation or diversifying uses.

Models for tourism partnership and collaboration—
Partnership and collaboration offer some hope for public agencies working with networks of institutions within the SES framework (Bramwell and Lane 2000, Mellon and Bramwell 2016). Some public agencies are beginning to work closely with tourism promoters, providers, and agencies and municipalities to engage in recreation planning and to communicate changes in policy or management. Examples for collaboration and capacity building in protected area tourism have been shared in the International Union of Conservation of Nature (IUCN) guidelines for sustainable tourism (Leung et al. 2018). They may participate as members in visitor bureaus or regional development boards, where they seek common goals for visitation levels, activity types, and the spatial distribution of visitor activities to reduce social or environmental impacts or promote community benefits. In some instances, such as the Greater Yellowstone Coordinating Committee, collaborative groups have emerged, bringing together various entities that play a role in the visitor industry, including public land managers. We recognize that capacity constraints in public agencies make it challenging to match the level of commitment required to participate effectively in collaborative processes. Public agency planners and partnership coordinators working together may gain added capacity by developing linkages with local and nonlocal tourism providers and promoters to plan for tourism in a way that is consistent with the agency's vision and does not exceed agency capacity to manage resources. Greater engagement of land managers with regional development entities can lead to recreation plans that are socially and economically sustainable for host communities and public agencies.

Compelling Questions

This growing body of knowledge on collaboration and partnership dynamics has generated a number of intriguing research questions:

1. What drives tourism demand? How do global, regional, and local entities shape consumer trends? How does user-generated content shared on social media contribute to visitation patterns? What does that look like for

a particular national forest, national park, or protected area? How is tourism demand affected as the U.S. population becomes more diverse? How is tourism demand affected by changes in forest landscapes? How do public land agency policies and management actions shape visitation patterns?

2. What are the direct and indirect benefits that public lands visitation provides to rural communities? What are some of the challenges or concerns associated with a reliance on tourism? How do we measure the distribution of economic and social benefits at various scales? How can the economic and societal benefits of public lands tourism be leveraged to provide equitable community services and resources?
3. What models can be employed to use the revenue generated from tourism to ensure the provision of high-quality experiences through the development and maintenance of facilities, infrastructure, services, and programs?
4. What tools, metrics, or planning frameworks exist (or are needed) that can help public land managers in the United States consider whether recreation plans are economically and socially sustainable for rural communities? What can we learn from ecotourism and sustainable tourism indicators used in other parts of the globe? How might agencies cooperate to ensure that sustainable tourism guidelines developed by the IUCN be applied in the United States?
5. Can effective coordinating models be found to support regional sustainable tourism planning and management?

Conclusions

Visitors to national parks, forests, and protected areas generate income and employment opportunities for gateway communities. Tourism linked to natural and cultural heritage represents an opportunity for rural development. Historically, resource managers have focused on the supply side—providing quality outdoor experiences and a diversity of settings for visitors to public lands while protecting the natural and social environment. More recently, land managers have recognized that outdoor recreation is part of a larger tourism system and that many local and nonlocal partners and proponents play a role in shaping recreation demand. In addition, agency planners are beginning to acknowledge the impact of management decisions related to roads and facilities on host communities and tourism enterprises. Expansion of tourism leads to impacts on natural and cultural resources, but also can affect the distribution of economic benefits and social dynamics within host communities. We have laid out the critical need for embracing tourism in sustainability planning for public lands, illustrated the barriers and challenges, and

highlighted new conceptual approaches and trends that can help to achieve these goals. We hope to realize a vision for public lands that serves the economic and social needs of neighboring communities, while also improving and increasing opportunities for tourists.

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Chapter 9: Global Dimensions: Trends, Lessons, and Collaborative Learning

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> Go abroad and you'll hear news of home.
>
> —English proverb

Purpose

This chapter identifies global dimensions and international perspectives that may help shape a research agenda for the future of sustainable recreation and tourism on public lands and in protected areas.

Problem Statement

Any attempt to better understand the future of sustainable recreation will benefit from considering the international context of tourism, recreation, and protected area management, in which important trends are emerging and valuable lessons may be shared. Although the United States was an early leader in recreation and tourism research, contributing to the training of managers around the globe, we have yet to systematically consider what international conservation, recreation, and tourism approaches can now teach us. Moreover, a better understanding of international recreation will further our overall initiative to increase access and diversity in the outdoors, as outlined in the prologue of this report (Cerveny et al. 2020).

A better understanding of international recreation will further our overall initiative to increase access and diversity in the outdoors.

We have identified two interrelated layers of global dimensions of sustainable recreation that would benefit from further research. The first involves the growing numbers, ethnic diversity, and range of recreational pursuits of foreign visitors to protected areas in the United States. The second addresses how protected-area managers around the world, including those in the United States, can more effectively share and learn from collective experiences and discuss comparative challenges and opportunities.

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Dimensions of the Problem: Keeping Up With Increasing International Tourism on U.S. Public Lands

International tourism is a critical issue in sustainable recreation that will continue to provide opportunities and challenges for public lands management in the United States. An estimated 77 million international tourist visits were made to the United States in 2015, an increase of more than 17 million since 2006 (UNWTO 2016). About 35 percent of visitors to U.S. national parks and monuments are from other nations (U.S. Travel Association 2016), and from 2012 through 2016, international visitors to U.S. national forests averaged 3.3 million people per year (USDA FS 2017). These numbers will most likely continue to increase as more of the developing world gains the means to travel internationally. Many international tourists seek the same recreational opportunities as U.S. residents, while others seek a different form of experience and have distinct expectations that need to be better understood by recreation and tourism researchers and managers. Issues include addressing the influence of cultural norms on what is deemed to be appropriate behavior on public lands as well as ways to enhance cross-cultural understanding and deal with the difficulties of messaging to audiences whose first language is not English.

The increased pressure on protected areas resulting from international tourism requires innovative approaches to managing park and recreation settings. For example, the significant increase in international large bus-based group tours in Yellowstone and Grand Teton National Parks has put a strain on park infrastructure and services while compromising experiences for traditional visitors using personal vehicles. When large numbers of visitors exit a bus and arrive at a viewpoint, the character of the experience is immediately changed, often resulting in conflict among visitors and between visitors and staff, which at its foundation is a result not just of the number of visitors flooding into an overlook but also a function of differing cultural norms about public behavior, personal space, and perceptions of crowding (Hofstede 2001) (fig. 9.1).

Ethnocentric attitudes and stereotypes have developed about different types of international tourists; these may be countered by parks becoming more welcoming and inclusive. One recent strategy has been to hire multilingual interpretive rangers, as at Yellowstone National Park, which hired its first Mandarin-speaking rangers in 2016 to improve communication with a growing number of visitors from China (French 2016). Many of these issues are also shared by an increasingly diverse U.S. population; addressing them can in turn help conservation agency staff address management challenges of making public lands relevant to underrepresented populations and recent immigrants to the United States. Current research on

Figure 9.1—Visitors to Old Faithful Geyser in Yellowstone National Park, Wyoming.

international tourists to World Heritage sites and other protected areas (e.g., King and Halpenny 2014, Lai et al. 2013) could inform management and communication strategies considered for U.S. protected areas.

Local communities will need to be involved as an integral component of a more globalized model of public lands management that helps sustain their livelihoods and heritage.

Barriers and Challenges

To address more diverse national and global public lands clientele, managers will have to navigate a complex web of local, national, and international users in a way that maximizes recreation fulfillment for diverse populations, while also minimizing adverse environmental, social, and economic effects and potential conflicts between these user groups and local residents. Local communities that may have been invested in nearby public lands for generations will need to be involved as an integral component of a more globalized model of public lands management that helps sustain their livelihoods and heritage. Barriers and challenges to global dimensions of sustainable recreation will primarily be tied to differing legal and governing structures among countries, cultural and behavioral norms, funding, and public policy.

Ideas for Addressing the Problem: Learning From Others

Although the United States has traditionally been a leader in protected area management, many other regions of the world are dealing with similar issues and developing innovative ways to address the challenges of sustainable recreation and tourism. We have yet to systematically learn from these examples and have historically approached both domestic and international agency training in terms of North American and western views of outdoor recreation and nature (Harmon 1987, West and Brechin 1991).

International designations for protected areas, such as United Nations Educational, Scientific, and Cultural Organization (UNESCO) world heritage sites, biosphere reserves, and Ramsar sites have long bounded U.S. protected areas to larger international networks, but the relationship of these networks' management practices to public lands agencies is not well understood. The new International Union for Conservation of Nature (IUCN) best practice guidelines (BPG) on sustainable tourism and visitor management (Leung et al. 2018) provide a global collection of examples of how international recreation and tourism management issues and challenges are addressed. One aspect of sustainability pertinent to all areas of the world is rapid urbanization and influx to cities coupled with depopulation of rural areas, as well as the rise in international tourism. The recreation research agenda will involve analysis to garner a better understanding of (1) how the concept of recreation is translated internationally and cross-culturally; (2) how other countries are funding sustainable recreation and tourism efforts; (3) recreation and tourism policies at the international level; (4) strategies for outdoor recreation and tourism to diversify livelihoods, create jobs and income, and promote rural development; and (5) public engagement strategies and governance arrangements. As discussed in chapter 11 of this report, case study research is an effective and informative way to understand various contexts of outdoor recreation issues, which we implement below. The following four case studies represent a brief and selective survey of global trends, highlighting the diversity of issues facing sustainable recreation around the globe.

Case study 1: outdoor recreation access in Western Europe—
In Europe, home to about one-third of all protected areas in the world (WDPA 2018, World Bank 2018), there is a significant lack of opportunities to experience locations where natural processes dominate the landscape. Despite the high number of protected areas, these areas are often small or not pristine, or they consist primarily of land in private ownership. Thus, there are a lack of opportunities for such experiential dimensions as escape, stress release, solitude, and adventure (Bell et al. 2008).

Limited recreational access is particularly evident in what is termed the Atlantic Region, encompassing the northwestern-most European countries with the least amount of forest cover. Some European countries have tackled inaccessibility to open space by passing right-to-roam laws and by building trails that cross both public and private lands. In Norway, the age-old cultural practice of **allemannsretten** ("right to roam") has been formalized through legislation that provides access to all uncultivated land for recreation, including hunting (Øian and Skogen 2016: 104). Similar laws to different extents have been enacted throughout the Atlantic Region, including public footpath infrastructure throughout Great Britain as part of the 1949 National Parks and Access to the Countryside Act. This policy paved the way for the Countryside and Rights of Way Act of 2000, which provided complete right-of-way access to scenic areas. In general, landowner and public responses toward these policies have been positive and have improved stewardship, access, and conservation in tandem (Campion and Stephenson 2014, Church and Ravenscroft 2008, Sandell and Fredman 2010). Here, maintaining access to the outdoors regardless of land ownership is of paramount importance, more so than in other areas of the world—including the United States and much of the Western Hemisphere—where public access to private land is much more restricted. In the United States, policies regarding public access have been contested all the way to the Supreme Court, and center on rights of access versus the right to exclude (Anderson 2007) (fig. 9.2).

Although policies as extensive as Europe's right-to-roam laws are unlikely to pass in the United States, domestic infrastructures for outdoor access can be improved, especially in such areas as the Southeastern United States, where public lands are sparser, creating massive inequities in terms of access. Strategies for improving access could include funding mechanisms and financial incentives for private landowners to provide rights-of-way for trails and hunting and fishing areas, especially near population centers without nearby public lands. Such an approach has been successful in establishing long-distance trails such as the Appalachian

Strategies for improving access could include funding mechanisms and financial incentives for private landowners to provide rights-of-way for trails and hunting and fishing areas, especially near population centers without nearby public lands.

Figure 9.2—Cross-cultural differences in rights to roam and public-private property laws.

Trail, although these trail systems are typically located on public lands far from population centers. Management groups such as the U.S. Forest Service's State and Private Forestry division as well as nongovernmental organizations (NGOs) can play integral roles in working with state and private landowners to help improve outdoor access. The Nature Conservancy, for instance, has been purchasing and providing recreational opportunities in urban-proximate natural areas, such as the Potomac Gorge in Virginia. Many U.S. state wildlife agencies are also providing financial incentives to private landowners to open their lands to at least limited public hunting and fishing.

Western Europe presents an important case study for understanding the management of protected areas with high populations, and East Asia should be considered as well. As population densities generally increase throughout the world, providing sustainable recreation will require a reappraisal of which recreation opportunities are still feasible in some areas, such as solitude and escape, in light of the need to balance increased access to public lands with environmental protection. Management plans may need to be tailored to specific recreation opportunity goals depending on demographics, land use sustainability, and volumes of visitor use.

Case study 2: equity, commodification, and international tourism in developing nations—

For developing nations, ecotourism has become the primary framework through which many protected areas are funded and managed, more so than an emphasis on localized recreation such as the aforementioned European examples, or the U.S. National Forest System. This reliance on ecotourism depends on the premise that imperiled resources are best protected through a symbiotic relationship of environmentally sustainable tourism and community socioeconomic development (Brooks et al. 2006). However, such approaches have varied success rates and can produce unintended consequences, especially when dealing with indigenous, colonial, and power dynamics (Coria and Calfucura 2012). International issues pertaining to ecotourism can yield important insights to U.S. policies as we look to provide better opportunities for more robust and sustainable local economies adjacent to and within protected areas.

In southern Africa, nature-based tourism accounts for as much revenue as farming, forestry, and fisheries combined (Balmford et al. 2009), and constitutes a substantial portion of the gross domestic product of countries in this region. As such, protected area management has catered primarily to international visitation and generation of foreign exchange, which has resulted in colonial and equity-based conflicts with local populations. This is a problem found in many regions of the developing world where outdoor recreation tourism dominates (West et al. 2006). For example, in Namibia, high entrance fees and lodging costs have resulted in

parks being managed almost exclusively as methods of securing foreign currency (Novelli et al. 2006). But, at the same time, the rise of wildlife-based conservancies has also spread conservation outside of formal protected areas and has led to increased tourism and greater community benefits overall. Over half the total area devoted to conservation in sub-Saharan Africa is open to some level of sport hunting, with its own set of challenges and conflicts related to conservation, commodification, and ownership (Spenceley and Goodwin 2007). In contrast, in some Latin American developing nations such as Brazil, Chile, Argentina, and Costa Rica, in addition to high levels of international ecotourism, domestic visitation to parks and reserves is also increasing rapidly, creating more popular and political buy-in to conservation than in countries where most visitors to parks are foreigners (Sattler et al. 2016).

As we look to promote tourism alongside recreation, similar issues are likely to arise on U.S. public lands where local communities may feel excluded from the benefits of burgeoning national and international tourism. Disenfranchisement will be felt particularly when traditional activities such as hunting, grazing, forestry, or mining come into conflict with conservation paradigms, recreational visitors, and enterprises with different viewpoints toward extraction. In Tanzania, for instance, large game preserves were created that promoted tourism but restricted the ability of local Maasai peoples to subsist in traditional ways that were vital to their livelihoods, cultural identities, and social organization (Charnley 2005). As Charnley (2005) noted, ecotourism should provide a pathway not just for economic growth but also deeper social and political justice goals in ways that are not top-down or paternalistic by governments and NGOs. Successful ecotourism development approaches should also be culturally appropriate and should promote community empowerment, ownership, and co-management (Coria and Calfucura 2012), all of which will be important lessons for developing ecotourism policies domestically. Several more international examples of protected area tourism serving as sustainable financing tools in support of conservation and community development can be found in the IUCN BPG (Leung et al. 2018).

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Case study 3: NGOs and the international promotion of heritage in protected areas—

With the exception of certain national parks and historical monuments, many public lands in the United States are promoted as places of pristine wilderness devoid of humans, rather than as places with deep human histories integrally linked to both natural and cultural heritage. In other areas, cultural heritage plays a more critical role in public lands management. In Peru, for instance, cultural identities tied to the country's indigenous and archaeological past permeate the country's public lands and parks and are promoted at a national level. Such approaches are useful as the

Identifying cultural ecosystem services at distinct landscape and site levels and elevating them to the priority level of biophysical services is one approach to better integrate heritage recreation opportunities.

United States looks to increase awareness of cultural landscapes, senses of place, and the place of indigenous peoples as well as rural historical lifeways within our public lands. One of the major challenges to such an approach is adapting existing concepts, such as the Recreation Opportunity Spectrum (Clark and Stankey 1979) to cultural heritage, because these concepts rely on a set of environmental rather than cultural measures. Identifying cultural ecosystem services at distinct landscape and site levels and elevating them to the priority level of biophysical services is one approach to better integrate heritage recreation opportunities (Daniel et al. 2012), although such an approach is new and not well developed. In the Forest Service, the 2012 forest planning rule mandates that ecosystem services be taken into account during planning and management, thus lessons learned from international engagements with cultural services are especially pertinent.

International organizations are also assisting in the integration of cultural heritage into protected areas, including the IUCN and the International Institute for Environment and Development. They have been working to preserve what are referred to as "biocultural heritage areas" throughout the world, starting with the Potato Park in Peru. The Potato Park created a protected area aimed at preserving indigenous livelihoods alongside the protection of Andean food crops and cultural landscapes (Argumedo 2008). Recently, an ambitious transnational initiative has developed through UNESCO and the governments of six Andean countries to develop and conserve the expansive Inka road system, known as the Qhapaq Ñan, through an integrated natural and cultural resource ecotourism framework. The management plan, which was formalized in 2012, will preserve more than 30 000 km (18,641 mi) of ancient Inka roads, centered on local community co-management, with visitor management strategies still being developed (UNESCO 2018). Such approaches that integrate human dimensions of heritage with resource-oriented management (Hall and MacArthur 1996, McCool and Moisey 2001) and ecotourism will be critical to the sustainability of public lands both in the United States and abroad. In the United States, we have a troubled relationship working with indigenous and other marginalized resident peoples in public lands management (Castro and Nielsen 2001). Representation of American Indian connections to public lands, and co-management strategies that recognize tribal sovereignty, are among the many examples that require better models for the future, with significant lessons to be learned from international contexts.

Other NGOs, including the Paris-based International Council on Monuments and Sites and the George Wright Society in the United States are also key allies in conservation efforts and the promotion of sustainable recreation and tourism to both natural and cultural sites and landscapes. The Forest Service has long supported programs enhancing sustainable recreation in other countries through its International Program Division, particularly in Brazil (e.g., Cunha et al. 2018). The

program of capacity building in Brazil has emphasized connecting Brazilians with their public lands and natural heritage through a multithreaded process of courses, workshops, demonstration sites, twinning, seminars, and a community of practice. Lessons from this engagement and others can help public land managers domestically advance sustainable recreation management and research through direct agency engagement and knowledge exchange abroad. This allows us to not just learn from others, but to allow others to learn from us, and to chart a unified, global course toward the future of sustainable recreation.

Case study 4: lessons from national political agendas: the "ecological civilization" movement in China—

Finally, the economic boom and subsequent environmental conservation initiatives in China present another important case study for understanding the global dimensions of outdoor recreation. Longstanding issues with pollution and environmental conservation, coupled with climate change, have become key issues for national political agendas, with significant implications for outdoor recreation and protected areas management. China is introducing a series of new protected areas and national parks as places to serve both increasing national capacity for recreation and an increased prioritization of conservation (Cao et al. 2015, Xu et al. 2017). China is especially interested in quantifying ecosystem services, including economic benefits of ecotourism and protected areas, to promote rural community development alongside environmental conservation (Zhang and Zhou 2013). China's relatively recent conversion from a rural and subsistence-based economy to an urban-industrial one has created a critical need for rural economic infrastructure that sustainable recreation and ecotourism may be able to provide (Cao et al. 2015, Stone and Wall 2004). However, many of these projects are in their early stages, and the results of ecotourism's effect on local community development is yet to be determined.

China's new public lands policy is part of its broader "ecological civilization initiative," which looks to frame the entire future of China's socioeconomic identity and policies in terms of ecological sustainability (Tiejun et al. 2012, Wei et al. 2011). As part of that effort, China has recently decided to pursue a centralized protected areas system and policy modeled partly on the U.S. National Park Service (Xu et al. 2017). The country has defined a series of high-priority protected areas as demonstration sites that should be monitored closely to learn about the applicability of U.S. models to other countries with quite distinct economic and political systems and levels of development. Most other countries, and most protected areas in the world, permit extractive and multiple land uses, and either allow for private and tribal lands within those lands or have extensive inholdings, mirroring the National Forest System model in the United States. Comparing and contrasting governance approaches, levels, and types of recreational uses in a land use and ownership

mosaic are important for protected area managers globally, with the clear understanding that no one management philosophy, governance arrangement, type of protected area, or levels and types of tourism and recreational uses or local involvement is appropriate for all conserved areas in a locality or nation or the world as a whole. In this case, the ecological civilization initiative in China highlights the ways in which protected area management and environmental conservation are becoming top-priority political objectives, and initiatives such as these should be consulted when thinking about how to frame outdoor recreation within broader social, political, and environmental frameworks.

Synthesis: Visions for the Future of Global Sustainable Recreation

Visitation to public lands is not only increasing in volume, but also in the diversity of visitors locally, nationally, and internationally. This includes the activities they pursue and the experiences, connections, and benefits they seek. As such, traditional views of stakeholdership tied primarily to domestic audiences are being transformed into a global and diverse user base in popular recreation areas. This environment is shifting the economics of land use and is creating conflicts between extractive industries and tourism and among different recreational user groups. As a result, demands on protected areas are growing and diversifying, which emphasizes the critical need for information on how to resolve not only provision of visitor experiences but also the resolution of conflicts over land use, recreational pursuits, equity of access, management, and representation.

Although we were early leaders in designing outdoor recreation and land management programs worldwide, it is time for us to turn our gaze outward and look for international lessons that can improve the future of our own recreation and conservation systems here at home.

We have provided a general overview of tourism, recreation, and public land use in selected areas around the globe. Global insights include cross-cultural differences in public-private land access seen in western Europe, a commodified and primarily international-based protected lands strategy in southern Africa, an emphasis toward cultural heritage and co-management in Peru, and a national agenda development-based model in China. Each of these examples is influenced by its own cultural, historical, and geographical trajectories, but has a clear parallel with most, if not all, the sustainable recreation issues being faced here in the United States. Although we were early leaders in designing outdoor recreation and land management programs worldwide, it is time for us to turn our gaze outward and look for international lessons that can improve the future of our own recreation and conservation systems here at home. Systems-based approaches, such as those described throughout this report, will need to consider the United States within its larger international context. This includes how management decisions within the country affect broader international systems and vice versa. Foundational changes

toward an internationally informed land management system are critical as the world becomes increasingly globalized, and future research should continue to analyze international recreation and tourism trends, challenges, and opportunities from around the globe.

Compelling Questions

1. What can we learn from other nations about ways to increase the relevance of protected areas, expanding their use to immigrants and long-term foreign residents, in addition to short-term foreign visitors?
2. How can we use technology, social media, and state-of-the-art interpretive methods and techniques to relay messages and create memorable experiences for visitors without relying on English language skills?
3. What are international co-management strategies for better integrating and representing indigenous and marginalized groups within outdoor recreation and land management plans?
4. Do other parts of the world conceptualize human activities on public lands as recreation or tourism or both? How do their definitions of recreation and tourism or human and public use differ from our own?
5. Along similar lines to question 1, what precautions do we need to take with the lessons we learn from other countries, if there are indeed significant cultural differences between our concepts of protected areas?
6. How can we successfully use tourism and recreation to contribute to improving local livelihoods and create more robust, diverse and sustainable local economies around protected areas?
7. When should we be thinking of outdoor recreation as a global system, and when should we think about each area within its own local context?
8. What can we learn from others about how to increase buy-in and support for recreation on public lands by increasing opportunities for nontraditional visitor use activities often considered outside the realm of outdoor recreation, such as foraging, harvest of nontimber forest products, artisanal extraction, religious ceremonies, spiritual contemplation, and other activities that tie and bond communities to the land and waters and that might be more important for new immigrants, foreign visitors, and local inhabitants alike?
9. What role, if any, should international conservation groups play in U.S. public lands policy and management?
10. How can international designations of U.S. protected areas, such as world heritage sites and biosphere reserves, provide mechanisms to transfer knowledge and build collaborative learning with international counterparts?

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Part III: How? Conceptual Approaches

Chapter 10: Laying the Foundation

Stephen F. McCool, Steven Selin, and Francisco Valenzuela[1]

> There are two things that interest me: the relation of people to each other, and the relation of people to land.
>
> —"Wherefore Wildlife Ecology?" (unpublished manuscript)
> in *Aldo Leopold: His Life and Work*

Our Challenge: Developing and Disseminating Knowledge to Enhance Society's Relationship With Its Natural Heritage

Societies flourish when their natural heritage thrives. Benefits derived from their natural heritage include resources that can be extracted for sustenance and shelter such as wildlife, vegetation, and minerals, as well as psychological benefits such as the satisfaction acquired from the uplifting of the human spirit, a sense of fulfillment, and a sense of identity. When connections to our natural heritage are severed, we may lose those benefits.

Public lands serve as a "commons" for our culture, and as protected lands represent a major means of ensuring those connections to American society. Managing these commons reflects our belief in the concept of community and culture. Public lands are "a sharing together" of a future that not only protects the beauty and richness of our current ecosystems but also ensures that future generations will have the opportunity to enjoy those benefits as well. Visitors to our public lands can be transformed by engaging in such experiences as a hike through a national forest, viewing a magnificent mountain on the shoulders of which reside an ancient forest, or by something as simple as planting a tree in a neighborhood park. Such activities may result in enhanced physical conditioning, better understanding of the natural environment, and reduced stress, values that may lead to calls for better stewardship of public lands.

This transformation requires visitors to have personal and direct interactions with nature, and with each other in these natural places. Visitors experiencing direct sensory contact with the beauty, wholeness, energies, and aliveness of natural ecosystems often transform their experience into concern for and love of

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these special places. As a community, these impassioned humans are inspired to learn about their heritage and can be empowered to become citizen stewards. Public lands, by offering many opportunities for connection, enhance the mental and physical health of visitors and the economic vitality of communities adjacent to or embedded within them.

The relationships between people and public lands are growing and changing, in ways that we may not fully appreciate. These human-ecological relationships are dynamic, changing in often unpredictable ways, but there remains a connection, as McCool and Freimund (2015: 407) argued in the context of wilderness recreation:

> People begin to form new relationships, fresh alliances emerge, and innovative visions are proposed. This reorganization phase [of the adaptive cycle] 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.

Managing adaptively means preparing ourselves politically, managerially, and scientifically for changes in demand and types of connections that are more relevant to the societal norms and expectations of the future.

Managing adaptively means preparing ourselves politically, managerially, and scientifically for changes in demand and types of connections that are more relevant to the societal norms and expectations of the future. The idea of managing adaptively in this sense results from a paradigm shift, a change in mental models of management and planning that are needed to manage successfully in an era of turbulence.

One gets the sense that there is a lack of appreciation of the importance of these connections, and closely associated non-utilitarian uses, such as visits associated with spiritual and cultural values. One measure of the importance of these connections to society is the spending by visitors to public lands. Visitors spent more than $18 billion in communities located near national parks in 2016 (Thomas and Koontz 2017), supporting more than 318,000 jobs. Spending to visit Yellowstone National Park alone totaled more than $500 million. Similarly, the economic significance of recreation uses of national forests far outweighs that of timber production: Talberth and Moskowitz (1999) estimated that the contribution of recreation, including hunting and wildlife observation, to the country's gross domestic product is more than 31 times that of the Forest Service timber program, and this excludes other uses such as berry picking, harvesting medicinal or cultural plants, photography, visiting former homesteads and gravesites, and so on. Recreational use of national forests and grasslands is estimated to be responsible for $13 billion in spending and support for 194,000 jobs. Chapter 6 of this report (Wolf et al. 2020) further explores the economic impacts of recreation.

One of the consequences of recreational use of public lands is enhanced health through increased physical activity. Although these consequences are rarely discussed in the literature, providing more access to public lands may not only enhance health and well-being but may reduce the annual bill for health care by millions (see Carlson et al. 2015).

Yet neither the National Park Service nor the Forest Service devote the staffing (in terms of numbers and capabilities), programs, and infrastructure resources needed to support the growing and diversifying demands in this arena. The Forest Service devotes less than 10 percent of its annual operating budget to manage recreation programs and facilities. Until recently, the agency had no training or continuing education program focusing on recreation or other culturally relevant visitor use programs. Although visitation to national forests and grasslands is expected to grow significantly over the next decade, the budget for managing recreation is projected to shrink to make way for sizable increases in funding for fire suppression and management. This conversion of growing demand and shrinking resources results in a perfect storm for conflict and damage to our natural and cultural heritage.

People trained and educated in the art and science of responding to and shaping desired changes in social-ecological systems are the stewards of these resources. We place our trust in those stewards to enhance and sustain the opportunities and benefits of the social-ecological systems within which public lands exist. Their skills, creative abilities, and agility influences how connections are transformed into mutually beneficial relationships between management and their constituencies. Their actions are influenced by knowledge about these social-ecological connections, the psychological, sociological, and ecological attachments that people and communities hold with the land, and the governance in which they are situated. Building a new social-ecological paradigm and grounding it in scientific knowledge and the development of effective management tools and disseminating it to recreation managers is a principal aim of research in the 21st century.

And yet the context within which these managers work has become more volatile, more uncertain, more complex, and even more ambiguous and challenging: these challenges are not only institutional in character—e.g., the readiness, if you will, to change paradigms of management—but also political (funding for visitor management) and individual—the agencies no longer have the capacity to provide for these experiences. Finally, there is a paradigmatic challenge as well: how can agencies really engage in the integrated, collaborative style of management required in contexts of complexity, change, and uncertainty that characterize the 21st century and the mix of expectations and demands placed on public lands as noted in the prologue of this report (Cerveny et al. 2020).

What We Are About

> I think having land and not ruining it is the most beautiful art anybody could ever want.
>
> —Andy Warhol

Our planet is undergoing rates of human-caused ecological change never seen before. Society is becoming disengaged with nature and its needs for stewardship. Social ills including loss of identity and purpose, depression, and unhealthy physical conditions can be lessened when people interact with natural ecosystems. We think that recreation-based interactions are the dominant way in which we interact with our natural heritage. At the same time, public lands and the ecosystems they contain are under increasing pressure to economically benefit society as well.

Nature-based and heritage recreation also maintain an important interaction between people and the natural environment that contributes to public lands sustainability. In addition, people working in nature-based settings, such as in forest restoration or trail construction, may receive benefits from doing so. The importance of scenic, natural environments is underscored by migration to these places because their natural environment is so attractive. See Blahna et al. (2019) for further discussion.

Building a knowledge base to meet this aim within a context of uncertainty and complexity requires a strategy suitable for the "wicked" and messy contexts of the time.

Building a knowledge base to meet this aim within a context of uncertainty and complexity requires a strategy suitable for the "wicked" and messy contexts of the time. Wicked problems arise when there is little social agreement on goals and when there is scientific disagreement on cause-effect relationships (Kohl and McCool 2016). Further, wicked problems are difficult to resolve because they involve value judgments about what is most important. We know little about how modern society makes connections in ways that lead to sustaining its heritage. Possessing this understanding is particularly useful in the 21st century context of complexity, uncertainty, and change, where demands for natural resources are growing and diversifying, and conflict over their uses is rising dramatically. This context raises new questions, challenges, and opportunities, but requires innovative approaches equal to these to develop and disseminate the knowledge necessary for managing this heritage.

We are about working to gain the interdisciplinary knowledge needed to achieve the great potential contribution that public land management can make toward solving the pressing issues of our time, of contributing to people's lives and the well-being of communities while protecting and enhancing our natural and social capital. The human connection with public lands has tremendous potential to provide vital benefits for the economy, public health, family and community life,

problem solving, promoting democracy, restoring spirit, and changing lives for the better, but we need greater investments in research, knowledge transfer, management, and infrastructure. This research agenda takes a step toward closing the knowledge gap to assure the sustainability of our public lands and the communities that depend on them but will require a consensus and vision to ensure a commitment to change in management.

The Importance of Vision

> I went to the woods because I wished to live deliberately, to front only the essential facts of life and see if I could not learn what I had to teach and not when I came to die, discover that I had not lived.
>
> —Henry David Thoreau, *Walden; or, Life in the Woods* (1854)

We see a future that transforms what we now call recreation management into the management of social-ecological relationships. We envision the following:

> Public lands management recognizes the diversity of both the peoples and the connections people hold with their natural heritage, and requires that individuals and communities take responsibilities for the careful management of our common natural and cultural wealth for now and into the future.

How Will We Approach This Vision?

> It is the expansion of transport without a corresponding growth of perception that threatens us with qualitative bankruptcy of the recreational process. Recreational development is a job not of building roads into lovely country, but of building receptivity into the still unlovely human mind.
>
> —Aldo Leopold, *A Sand County Almanac* (1949)

The vision requires us to explore long-held assumptions about the scientific foundations of outdoor recreation management, their purposes, and our methods of implementation. At present, the science of recreation management is lagging behind the practice of recreation management because of the lack of resources and vision and of explanatory theory about the nature of the recreation experience and conditions that create citizen stewardship. Recreation research draws on a bewildering array of more foundational psychological and sociological theories or common knowledge without experimental proof with no agreed-upon philosophical approach. There is a need to use advances in basic sciences and to synthesize and integrate the vast amount of research in recreation behavior, management science, and human interaction with nature.

To achieve this vision, we need to advance, to take the field of recreation management and move it forward to provide managers the tools that have proven effective and equitable. We need new paradigms of research, dissemination, and management that provide useful and timely knowledge that not only inspires managers and scientists, but also the publics that visit these places. A systems theory of outdoor recreation in terms of social-ecological relationships that integrates with advances in ecosystem stewardship needs to be developed.

We also need to examine the organizational learning literature to see how we can better test hypotheses about co-production and dissemination of knowledge and technology transfer along with more efficacious methods of training and education. The modern recreation manager needs to be able to effectively orchestrate empowerment of citizens to practice stewardship, meet important individual and community needs, resolve difficult conflicts, and nurture a sustainable relationship with public lands and communities with increasingly limited government resources.

We end up with the inevitable question: What do tourism and recreation sustain?

We also consider the scale of spatial, temporal, and social-organizational dimensions. Social and environmental consequences of use of public lands occur at larger scales, such as building resilience in smaller communities and helping them develop and maintain a sense of community and ownership in their heritage. And thus we end up with the inevitable question of what it is that tourism and recreation sustain (see McCool and Bosak 2016 for an extensive discussion on this topic). Addressing this question is one step to understanding the how and what of recreation planning and management.

Both research and management are limited by not only existing knowledge, but also by a lack of capacity and social capital. The former focuses on resources available to ensure connections are managed well, and the latter deals with the knowledge upon which the competencies and confidence needed to make decisions that will lead to a sustainable future. Research helps provide the knowledge management needs to make good decisions; management helps research frame the issues, challenges, and opportunities for which more knowledge is needed.

Another dimension of the "how" focuses on the inherently integrated character of research and management. Doing research on sustaining connections requires many disciplines working together; likewise, management of these connections is not limited to one particular program area in an agency. All programs (e.g., watershed management, wildlife, recreation and scenery, silviculture, and so on) affect human-nature connections. The great advances to recreation management in the past have occurred when managers and scientists have worked collaboratively to solve significant problems. This requires a particular kind of leadership different from what has characterized collaborative efforts in the past (Selin 2017). We may

want to explore joint research-management-citizen scientist collaboration to resolve systemic problems that we anticipate arising out of the turbulent environment in which we live, for example.

Identifying the What

> We simply need that wild country available to us… For it can be a means of reassuring ourselves of our sanity as creatures, a part of the geography of hope.
>
> —Wallace Stegner, *Wilderness Letter* (1960)

The "what" is the last component we address in this strategy. It comprises the programs of research and knowledge building and dissemination emphasis areas that are needed to ensure that the connections fundamental to a flourishing human society are enhanced and used to achieve the desired sustainable relationship. What actions of research (such as better understanding of how connections at a human scale influences connections at a community scale) are described in this component? It is important that the research program begins with a better understanding of the "whole" (which we could describe as our vision) and then identify the parts, and study principally how the parts of a system relate to each other. These studies might be focused on how a system changes as the parts evolve—which they do—over time.

This program will be successful if it is linked to the managers and organizations that provide stewardship for public lands so that people benefit from them. They are the significant "middle-management" that ensures connections can still be made. And thus included in the "what" is a strategy for knowledge dissemination and transfer, including academic study and inclusion in a curriculum.

Conclusions

> To be whole. To be complete. Wildness reminds us what it means to be human, what we are connected to rather than what we are separate from.
>
> —Terry Tempest Williams, *Red: Passion and Patience in the Desert* (2001)

Mutually beneficial and self-reinforcing connections with our natural heritage are essential to the functioning of individuals and society; without them we, as a society are lost, without any particular aim or destination. Some connections with our natural heritage are already endangered, such as the ability to test our skills and knowledge in large natural areas, or how to sustainably harvest some of the goods that our natural heritage provides or use the services the natural environment affords us. A research strategy focused on developing and disseminating new knowledge will help enhance our connections with natural heritage and sustain them into the future.

Our challenge in contemporary 21st century America is to identify new knowledge helpful to management and disseminate that knowledge in ways that effectively change how we enhance connections between us and our natural heritage. Our challenge involves building new paradigms and partnerships of research and technology transfer that moves our field ahead of the growing and diversifying expectations the American public is placing on its natural heritage.

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Chapter 11: A Systems Thinking Approach for Thinking and Reflecting on Sustainable Recreation on Public Lands in an Era of Complexity, Uncertainty, and Change

Stephen F. McCool and Jeffrey D. Kline[1]

> Systems thinking is a discipline for seeing wholes. It is a framework for seeing interrelationships rather than things, for seeing patterns of change rather than static snapshots…Today, systems thinking is needed more than ever because we are becoming overwhelmed by complexity.—
>
> —Peter Senge, *The Fifth Discipline* (1990)

Purpose

The socioeconomic and biophysical contexts in which natural resource management takes place have been rapidly changing in recent decades. These changing contexts are bringing new complexity to the management of natural resources generally, and the question of how best to manage outdoor recreation specifically. We propose that this greater complexity is best addressed by research using a systems thinking approach able to account for the combined influence and interactions among relevant social, political, economic, and biophysical factors that influence recreation uses and values associated with public lands. We feel that this shift in research framing would offer greater opportunities for discovering new insights regarding people-landscape relationships that are central to outdoor recreation. This in turn would lead to greater potential for developing outdoor recreation policy and management approaches best suited to changing socioeconomic and biophysical contexts.

Problem Statement

Public lands are under more pressure than ever to provide ecosystem goods and services, including recreation opportunities, to a growing, ethnically diverse, and increasing population characterized by income inequality. These increasing demands coincide with generally declining land management capacity (e.g., budgets, staff, technical capital) of public land management agencies, increasing expenditures for fire management, and evolving relationships between people and their public lands generally.

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Decisions about how much public land to allocate to different uses, which uses should have priority, how much of what ecosystem goods and services public lands managers should strive to provide, how to manage public access, and what kinds of recreation opportunities to provide and where to provide them are among the most persistent questions that public land managers and planners face. These are questions for which there are few simple answers. In fact, we suggest that often these questions cannot be answered in conventional ways, but rather they fall within a realm of what are called "wicked" problems or "messy situations" (Rittel and Weber 1973). Wicked problems involve situations in which cause-and-effect relationships are not clear and there are disagreements over management goals, which makes understanding of problems difficult. For example, temporal delays between causes, such as a redistribution of visitor use, may lead to affecting opportunities for solitude, but the delay that occurs may make it difficult to link causes with effects.

Wicked problems arise because the social, political, economic, and biophysical contexts of natural resource management have dramatically changed from the late 20th century, particularly when there are disputes about values. For example, while more people have moved their homes to the wildland-urban interface, making fire management much more difficult, and demands for recreation have grown and diversified, the public land base supplying recreation opportunities has largely remained fixed. Confusion or disagreement about resource management goals abound; uncertainty about the efficacy of management tools to address changing needs has increased; and the legacy of management institutions seems poorly equipped to address challenges that require interdisciplinary thinking and action.

These challenges arise from two principal sources. First, past approaches to recreation decisionmaking tend to narrowly bind analyses of resource management, in which recreation is embedded, thus limiting the consideration of important values and interactions that are not easily measured. These narrowly prescribed approaches often do not consider interactions and larger scale emergent properties, thereby leading to incomplete analyses, such as an area being viewed as a timber-producing one when its chief value is recreation. These biases can result in a false perception that an analysis used to support recreation decisionmaking is complete. Moreover, although recreation is often the most important value of U.S. public lands, valid measurements of its financial, health, and aesthetic benefits may be left out of the management process.

Second, these challenges arise because of "volatility, uncertainty, complexity, and change" (VUCA)[2] resulting from complex biophysical and socioeconomic processes occurring simultaneously at a variety of spatial and temporal scales. To

[2] This acronym was first used in the 1990s by the U.S. Army to describe the situation in the Balkan region, in which the Army was engaged.

some extent, VUCA conditions have existed for a long time in natural resources, but the dominant paradigm of decisionmaking, built upon rational-comprehensive planning, assumed that they did not. These same forces present new decisionmaking challenges to public lands managers. For example, decision processes need to be more inclusive of constituencies and focus on fostering trust and a sense of ownership while also building consensus (see discussion of "eudomonic" values in Blahna et al. 2020). Meeting these challenges calls on managers to find ways to efficiently and equitably manage public lands to meet growing public demands. We believe that this requires the development of conceptual frameworks and knowledge that acknowledge and account for current biophysical and socioeconomic complexity as well as institutional barriers, and that foster effective ways to use these frameworks and deliver this knowledge to public lands managers.

Decision processes need to be more inclusive of constituencies and focus on fostering trust and a sense of ownership while also building consensus.

These challenges suggest a need for the research community to identify ways to address the demands and opportunities that public land managers currently face. Prevailing paradigms about recreation and its management are based on assumptions about the world and perspectives that may not be as useful as they have been in the past. We believe that prevailing paradigms may need to be modified or replaced by paradigms of planning, management, and science more suited to the complex and temperamental world in which public land management now takes place. We propose that a systems-thinking approach to research and management will be better able to respond to challenges and opportunities that managers currently face and would best advance our understanding of recreation and its management on public lands.

Dimensions of the Problem

Whether from the viewpoint of a planner, manager, or visitor, relationships between public lands and people vary across space and time. Visitor expectations change, often quickly, or sometimes are seemingly static, depending upon the context and such other factors as information technology, changing visitor characteristics, print and social media, and so on. Also changing in an increasingly diverse population are the types of connections that people have or would like to have with their public lands. Aging of the population and internal migration are shifting demands for the many different activities in which people engage, and these changes cannot always be well anticipated. Managers and planners, acting in their roles as decisionmakers, are influenced substantially by the rules and regulations under which they operate and their perception of the circumstances of a given issue, problem, or opportunity before them. More fundamentally, managers and planners also are influenced by their own world views (Kohl and McCool 2016). We rarely explicitly recognize the influence of such personal characteristics and how they affect individual behavior.

Because of dramatic changes in the context in which natural resource management takes place, long-held assumptions often are no longer adequate or suitable for guiding management and policy affecting the future. Just as likely is for social and ecological change to lead to unexpected consequences or "surprises." Failure to adequately anticipate social and ecological change often leads to planning processes, management behaviors, and programs that either do not work or have unintended consequences (Allen and Gould 1986, Tallis and Polasky 2009). Imagine a public use plan that limits use in one area, only to see it rise in another. Such shortcomings arguably can arise from adherence to conceptual models of natural resource management and research that are inadequate for addressing the complexity and dynamics inherent in relationships between people and the natural resources being managed. As we consider the 21st century management context, our previous conceptual models of natural resource management and research appear to have favored linearly oriented systems of causality, within a context also of loosely coupled cause-effect relationships that often resulted in the misunderstanding or miscasting of key public land management problems and their broader contexts (Cilliers et al. 2013, Lachapelle et al. 2003). Resilience may be a goal of management of a system. Resilience is "a measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations or state variables" (Holling 1973). Resilience, then, as a goal functions at the systems level, and thus requires an understanding of the parts of a system and the relationship among its parts. More resilient systems can respond to disturbances emanating from larger systems, such as a landscape-level fire, in which case the system returns to its natural ability to respond from the fire. A resilient community can respond to a larger scale disturbance, such as a corporate board deciding to close a wood processing plant. The community would have excellent problem-solving skills and be able to lay out a path forward and retain its characteristics as a viable community.

For example, developing management plans based on conventional approaches, such as rational comprehensive planning, procedural orientations, and limiting public engagement to a few places in decisionmaking processes, have led to distrust, lack of implementation, and, in some cases, outright public opposition. Conventionally, values and uses for which explicit measurements, such as cultural and spiritual values, and some nonmarket values including nonuse values, may not be adequately represented in plans, resulting in suboptimal land use allocations. Although new requirements mandating that federal agencies now consider ecosystem services when evaluating management plans and other proposed actions attempt to ensure that these types of values are addressed, it remains uncertain

whether such requirements will result in more meaningful analyses (Kline et al. 2013). National forest plans often have lacked detailed data on recreation use levels and the specific types of experiences that visitors desire, for example. Incomplete understanding of social-ecological systems has led to surprises involving increased impacts from management actions designed to reduce impacts.

Social-ecological systems generally involve many interacting components and processes, with interactions occurring nonlinearly and at differing spatial and temporal scales and scopes. This complexity in natural resource issues calls for scientific inquiry focused on systems as a whole rather than their individual parts. Complex systems include emergent system properties that preclude understanding through examination of their parts. Thus, for example, studying the characteristics of any given individual will not necessarily help managers understand how much impact on a recreation resource that individual has and how it might be managed. Because emergence is a property of the system, examining the complex system by examining its individual components (such as an individual user or management rule or action) fails to account for the system's properties (e.g., Cilliers et al. 2013). Systems also can be loosely coupled, such that causes do not directly and immediately lead to effects, and effects may have multiple causes, can be nonlinear, and can be asymmetric in that small changes in one variable may lead to large changes in another.

Social-ecological systems generally involve many interacting components and processes, with interactions occurring nonlinearly and at differing spatial and temporal scales and scopes.

Barriers and Challenges

Applying a systems thinking approach (a lens through which we can look) to natural resource management and recreation would involve challenges. First, moving to systems thinking is a change in paradigm (or conceptual model) for both research and management. Changing paradigms can be difficult, as it requires not only a change in how we assume the world "works," but also in the language we use to describe it, and the processes by which we manage. There will be people who do not want to change paradigms, simply because it is difficult, and because they believe the way they have been managing has been successful. As Sterman (2002: 513) noted, a sort of policy resistance develops, thus he affirmed "What prevents us from overcoming policy resistance is not a lack of resources, technical knowledge, or a genuine commitment to change. What thwarts us is our lack of a meaningful systems thinking capability." These barriers are applicable to both scientists and managers, as paradigm shifts require both groups to think significantly different than in the past.

For example, a concept about which there are varying perceptions regarding its usefulness in recreation management is carrying capacity. Although it has been

the focus of numerous studies, to date no inherent carrying capacity for recreation has ever been proposed for a given area. That said, much of what has been learned about visitor experiences and biophysical impacts has been done so by attempting to establish carrying capacities. Many observers now feel that carrying capacity may be too reductionist and therefore a too simplistic view of recreation to be of value to management (e.g., McCool and Lime 2001). In its implementation in management contexts, analysts have often failed to consider that perceptions of carrying capacity among visitors (and managers) likely vary by individuals, as do the fundamental relationships between visitors (and managers) and their perceived impacts (Hammitt et al. 2015).

Implementing systems thinking approaches in natural resource management contexts is not without its own set of challenges, but guidelines for implementing such approaches are beginning to emerge.

Also, institutions such as the Forest Service that are charged with managing public lands typically are organized by specialties (e.g., recreation, wilderness, wildlife, watershed). These specialties can develop into "silos" (see fig. 5.2 in chapter 5), which isolate discipline-specific analyses from one another, and ultimately can lead to different specialties competing with each other for resources or attention. We feel that the use of systems thinking can be one approach to linking and ultimately removing such silos, because it calls for meaningful input from each discipline, and requires and brings about disciplinary integration to the process of resource management (Cerveny et al. 2019). Implementing systems thinking approaches in natural resource management contexts is not without its own set of challenges, but guidelines for implementing such approaches are beginning to emerge (Kline et al. 2017).

The second barrier is communicating and educating researchers and managers about what systems thinking involves and how it can help to resolve natural resource management issues by better addressing complexity. Systems thinking is not a scientific discipline in its own right, but rather an interdisciplinary approach that focuses on underlying relationships, actions, feedback loops, delays, and other factors. Systems thinking is an alternative to the largely disciplinary-centric analytical model of knowledge that had prevailed in modern education systems (Kay and Foster 1999). There has not been much research on how to teach systems thinking and what pedagogical approaches and skills work and which do not (Atwater et al. 2008). How do we teach about such questions as "what is a system?" How does systems thinking help us understand and function in a context of complexity? When is systems thinking appropriate? In addition, systems thinking may be influenced by the specific place and context confronting a planner, manager, or scientist because human experiences are embedded within them.

Related to communication and education will be the necessity for public land management agencies to overcome constraints on funding, time, and the availability of required expertise to actually implement the approach in management and planning contexts. Such institutional constraints, including declining staffing capacity,

are noted as key challenges to implementing more integrated socioeconomic-ecological analysis to support public lands management in the United States (Kline et al. 2013: 151–152). Systems thinking, as a paradigm change, may lead to improved analysis and decisionmaking by improving understanding of how public land systems work.

Systems Thinking: A New Conceptual Approach

Applied in a public lands and recreation context, social-ecological systems thinking would explicitly recognize reciprocal connections and relationships between people and the landscapes they occupy, visit, and use. This would help managers and scientists to emphasize the system (e.g., a landscape providing high-quality recreation opportunities through the coordinated efforts of managers and their partners) and its function, rather than focus on specific components of the system (e.g., specific users or specific resources) via the lens of specific specialties or disciplines.

To use systems thinking, managers would need to consider for what purpose a recreation system exists, identify its components, describe the relationships among components, and indicate where characteristics about specific relationships create problems (or conflict) within the system. A relatively small-scale simple system whose purpose is to manage campsite impacts in a subalpine environment is displayed in figure 11.1. In this system, only management and campsites are shown as components, but such systems, even at the small scale, may have other components as well.

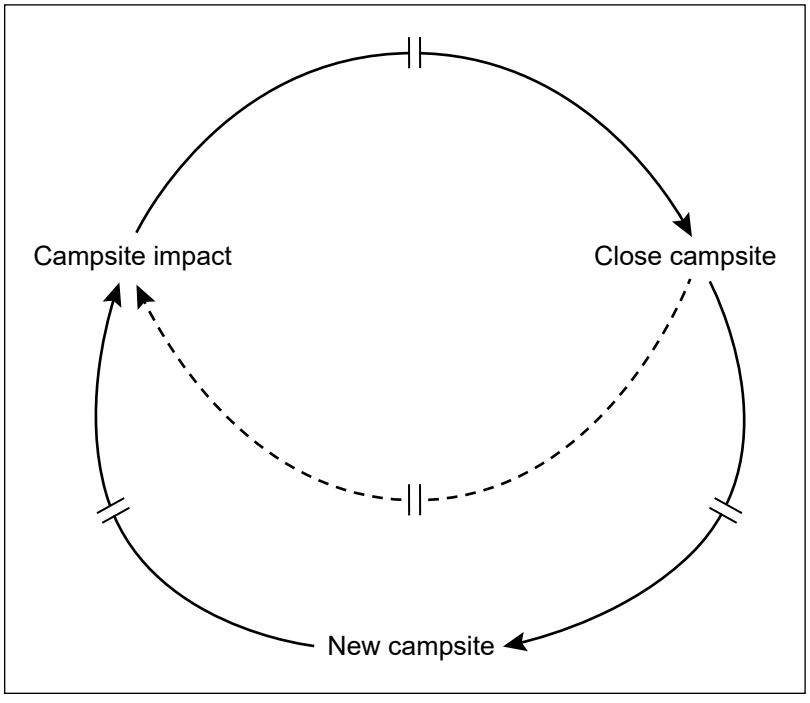

Figure 11.1—Causal loop diagram that shows how closing campsites in an alpine environment can lead to greater overall impact. When designated campsites are closed, visitors establish new campsites, causing additional impacts. These new impacts occur quickly, while recovery of closed campsites can take a long time, thus producing a total impact that is larger than the initial one. The diagram demonstrates the power of systems thinking in a complex system; this kind of situation is referred to as a "fixes that fail system."

A crucial point in applying systems thinking is bounding the system or describing the system components relevant to a particular purpose or decision.

A system has a specific function or purpose. That function may also be described as a goal. In figure 11.1, the goal may be returning the system to its preexisting condition and ecological functioning. In some social-ecological systems, the goal may be to distribute benefits from those systems in an equitable way.

A crucial point in applying systems thinking is bounding the system or describing the system components relevant to a particular purpose or decision. Recreation systems then will come at different spatial or functional scales, each embedded in the system that occurs at a larger scale. A larger scale system describing recreation policy, for example, may have the following components: suppliers (services, settings); policymakers, and visitors.

Each of these components is affected by decisions made by others within the system as well as "external" factors (which are simply components of systems existing at larger scales). For example, if policymakers reduce a given national forest's budget, it can lead to reductions in the supply of recreation opportunities, which in turn can affect visitors who formerly enjoyed an affected site. Of course, there are delays embedded in the system because these variables are loosely coupled in the short run. Alternatively, an increase in demand by visitors eventually affects the number of supplier services (e.g., tour operators or outfitters), which affects demand for settings, which then provides feedback to policymakers.

A more detailed example is a mid-scale depiction of a sustainable recreation system (fig. 11.2). It shows several linkages among components with their relationships and a few management actions. Of course, other authors may describe this system differently, but the point is if we take a systems perspective, we will increase our understanding of how we can better supply opportunities and better deliver the public land manager's components. In a very real sense, however, this system, in terms of its components, is similar to Fischer's (2018) description of forest landscape components of feedbacks, time lags, and cross-scale interactions.

Such systems are merely models or depictions that simplify a complex system. Their primary use is not prediction but understanding. As we gain understanding of a system, we add more components and connections. These systems, again, are mental models of how we see the world, how we see one thing connected to another. Such models are only descriptions; they do not imply a particular goal. However, systems generally have a function, and when they do, they become normative in the sense of a goal or function because they reflect value judgments. For example, the goal may be resilience, equity, or production of a certain ecosystem service. If a goal is equity, for example, we would design interventions in a system to achieve that. Figure 11.2 is an early attempt to depict a system whose function is sustainability, which is achieved by building a system that is resilient in the face of outside disturbance. In figure 11.2, the dashed lines show interventions in the system to move toward sustainability.

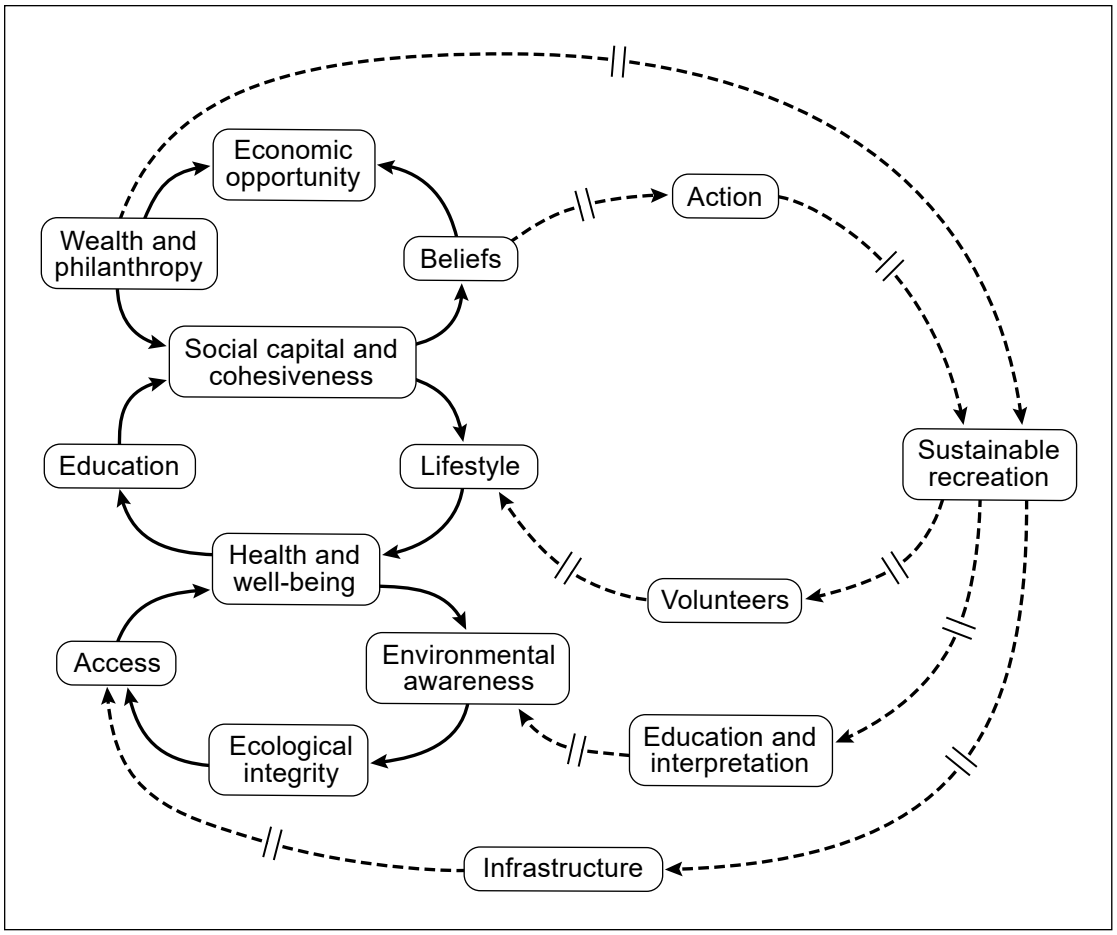

Figure 11.2—In this potential description of a sustainable recreation system, solid lines show the possible relationships among attributes that the literature commonly ascribes to sustainable recreation, and dashed lines show a few management actions and where they intersect. Gaps in the arrows indicate delays between one variable and another, while arrows show the direction of impact or influence. This relatively simple diagram is displayed only to represent how systems thinking is implemented through causal loop diagrams. Solid lines show the system, whereas dashed lines show potential interventions. Of course, the dashed lines in a real sense are part of the system.

Compelling Questions

Ideally, we feel that a shift to systems thinking as a research approach would enable greater discovery and more useful insights about the ways in which people connect to landscapes and how we might manage those connections. The very idea of "connections"—mentioned here and in the chapter 1—certainly imply a systems approach.

Key challenges to implementing a systems approach include:

1. Defining the relevant social-ecological system of interest in different contexts and different purposes when addressing issues regarding public lands management and recreation, including key human-biophysical connections and relationships.

2. Gaining useful knowledge about a relevant system and leverage points where managers have opportunities to influence the system and identify what work will be needed to use that knowledge to address issues.
3. Developing an understanding of the spatial and temporal relationships among system parts, including the nature and timing of various causes and effects.
4. Creating effective means for meeting challenges and taking advantage of opportunities in management contexts that are complex and uncertain.
5. Creating knowledge about the socioeconomic and ecological resilience of specific public lands recreation-based tourism systems, their vulnerabilities to various disturbances, and ways of retaining acceptable development trajectories.
6. Gaining an understanding of how to teach the importance of viewing the world as complex systems and how to use systems thinking as a way to function in complexity.
7. Overcoming analytical and institutional barriers to implementation.

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Chapter 12: Integrating Social, Ecological, and Economic Factors in Sustainable Recreation Planning and Decisionmaking

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> Ecosystems are not only more complex than we think, they are more complex than we can think.
>
> —Frank Egler, ecologist

Purpose

Sustainability science "transcends the concerns of its foundational disciplines and focuses instead on understanding the complex dynamics that arise from interactions between human and environmental systems" (Clark 2007: 1737). This is reflected by McCool and Kline (2019), who stated that "…a systems thinking approach views problems within a context of interacting social and ecological systems…," and that implementing systems thinking requires that we "explicitly recognize connections and relationships between people and their natural heritage." Thus, systems thinking requires integrating multidisciplinary information. However, Egler's observation cautions us about the challenge of shifting into systems thinking from the current "normal science" paradigm that dominates land management agency culture (Williams 2017). Agencies rarely have the time, budget, or expertise available for collecting and analyzing comprehensive landscape-level data. We propose that an important consideration for applying systems thinking in practice is identifying and integrating issue-specific social, ecological, and economic data while focusing on key analyses and relationships that provide enough information to help evaluate outcomes of specific management or policy actions (Ackoff 1967).

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This is more of a "bottom up," issue-driven approach to integration, which focuses on concrete problems and place-based issues (Blahna et al. 2017a, 2017b; Williams 2017), as opposed to "top down," standardized or metric-driven approaches that are common in systems analysis (Hoos 1983).

Problem Statement

After Rachel Carson (1962) documented the detrimental effects of chemical pesticides on birds, it has been widely recognized that using cross-disciplinary data is critical for making sound environmental decisions. Today, most environmental legislation (e.g., the National Environmental Policy Act (NEPA) and the Endangered Species Act) and protected area conservation models (e.g., International Union for Conservation of Nature, Resilience Institute) call for collecting and considering data across a range of disciplines. The need for integration is also a key aspect in outdoor recreation and tourism. For example, one of the principles of recreation resource planning espoused by the National Association of Resource Planners is that "recreation resource planning requires the consideration of many inputs such as … visitor and stakeholder preferences, economic impact of recreation participation, best available science, environmental conditions, and available information from recreation and resource monitoring." Moreover, U.S. Forest Service guidelines suggest that "to sustain the benefits of outdoor recreation for present and future generations, the recreation program must address and work toward a sustainable balance among the three spheres of environmental, social, and economic conditions" (USDA FS 2010: 4). It is also important to note that integration requires recreation to be considered in other natural resource program decisions while the objectives of these programs are also considered in recreation program decisions.

Forest Service guidelines suggest that "to sustain the benefits of outdoor recreation for present and future generations, the recreation program must address and work toward a sustainable balance among the three spheres of environmental, social, and economic conditions."

Integrating social and ecological data is difficult in conservation (Reed et al. 2017), and federal agencies have often been criticized for conducting analyses and making decisions based on simple or selective sources of data. Examples include the U.S. Fish and Wildlife Service's focus on single species biology, the Forest Service's focus on timber production, and the National Park Service's focus on recreation use. An important goal of NEPA was to mandate a process to determine if proposed federal actions (including management or programmatic plans as well as land-modifying projects) would affect the quality of the human environment by determining environmental impacts and considering related social and economic effects (CEQ 2007.) But integrated analysis is more than just accessing and summarizing data from different sources and multiple disciplines. Rather, integration requires developing analyses that synthesize social and environmental data so that they contribute equitably to improving the general understanding of the outcomes of management projects.

How should agency planners and scientists identify, collect, and integrate social, economic, and ecological knowledge in practical, relevant, and adequate ways to address specific sustainable recreation management needs? Even in simple systems, with only a few principal linkages or components, integration across disciplines can be difficult (Ostrom 2009). Although there is a large body of literature and case studies on the need and methods for integrating data in sustainable landscape conservation (e.g., Berkes and Folke 2000, Kline et al. 2017, NRC 2002, Reed et al. 2017), and models for integrating multidisciplinary data in recreation management (e.g., Limits of Acceptable Change, Visitor Impact Management), these methods are rarely applied in the field (Cerveny et al. 2011). Few case studies evaluate social and ecological outcomes of recreation management within a systems context, and there exist virtually no evaluation criteria, metrics, and monitoring strategies to help public land managers understand how to integrate data from diverse fields of study (Plottu and Plottu 2012).

This chapter proposes that data and analysis, though not the sole factors used in planning and decisionmaking, must play a key role. This reflects many agency requirements for using "best available science," leadership preferences for having data to support decisions, and recommendations of the Interagency Visitor Use Management Framework (a collaborative effort of six federal agencies). We are not just referring to quantitative social and ecological data and analytic formulas; we are also referring to the systematic collection and display of stakeholder values and perspectives. Because it is increasingly difficult to meet science requirements in this era of constrained budgets (Cerveny et al. 2020, Ryan et al. 2018) and data complexity, we argue that new approaches are needed to identify the most relevant data sources and **practical** methods for collecting and analyzing the data, based on the specific decision context. Learning from past successes and failures can pave the way for better and more efficient integration methods.

New approaches are needed to identify the most relevant data sources and practical methods for collecting and analyzing the data, based on the specific decision context.

Barriers and Challenges

The traditional approach for analyzing complex systems is to collect detailed and diverse datasets and develop tightly coupled data interaction models to explain causal relationships in the system (Hoos 1983). As Williams (2017) pointed out, this reflects a "normal science" mindset to address practical problems, with an underlying assumption that quantiative data and scientific analysis can answer most practical management questions.

Many of the barriers to integrative thinking and analysis are related to agency capacity and the complexity inherent in blending multidiscipline and multiscale information relevant to ecosystems (Kline and Mazzotta 2012, Kline et al. 2013,

The inertia built into land management agencies from decades of dominance by natural sciences still exists and is reflected in agency regulations as well as planning and management practices, tools, methods, and criteria for professional advancement.

Reed et al. 2017). Other barriers are attributed to a lack of consensus on how the planning problem is framed and agreement on what the principal objective or outcome of the planning problem is. Traditionally, most technical staff in land management agencies are trained in natural sciences, because they served as the foundational disciplines for natural resource management (Fischer 2000). However, "landscapes provide the setting over which wicked problems unfold" (Sayer et al. 2013: 8350), and environmental sustainability problems have social, political, and economic components that cannot be handled in the classic paradigm of science and engineering (Rittel and Webber 1973). The inertia built into land management agencies from decades of dominance by natural sciences still exists and is reflected in agency regulations as well as planning and management practices, tools, methods, and criteria for professional advancement (Cortner and Moote 1999).

In addition to the dominance of natural sciences in landscape systems frameworks, there is a challenge of upscaling those frameworks to include social dynamics of systems. As Sayer et al. (2013: 8350) pointed out, "'people' and 'society' [have been] notably absent from such considerations, and, as a result, conservation has been beset by disappointments and failures…and [now] recognition of the need to address the priorities of people who live and work within, and ultimately shape, these landscapes." However, social systems are as complex as natural systems. A conceptual diagram of how people are linked in a hypothetical landscape is shown in figure 12.1.[2] Based on a systems "assessment" criterion that drives many planning processes, all inputs, social as well as biophysical, ought to be collected up front, and interactions for each landscape decision should be assessed in a systems analysis framework. Although such comprehensive systems frameworks may be useful for identifying various factors and processes that influence human-ecosystem interactions, comprehensive measurement of detailed systems components often is not feasible in practice, owing to budget and time constraints, and declining capacity and investment in social science in public land agencies.

Social systems are as complex as natural systems.

Comprehensive measurement of detailed systems components often is not feasible in practice.

Besides complexity, there are several other direct barriers to integration using assumptions of normal science, such as data availability and comparability, computational limitations, cost and expertise limitations, and barriers to cross-disciplinary collaboration (Daniel et al. 2012, Ewert et al. 2006, Failing and Gregory 2003, Guerrero and Wilson 2016, McCool 2013, Ostrom 2009). Computational barriers are confounded because key system factors may be unknown or "loosely coupled," meaning that they may be indirectly or nonlinearly related to outcomes. Key

[2] **Kline, J. 2018.** Unpublished presentation to U.S. Forest Service, Pacific Northwest Research Station, Station Management Team, Portland, Oregon. February 14.

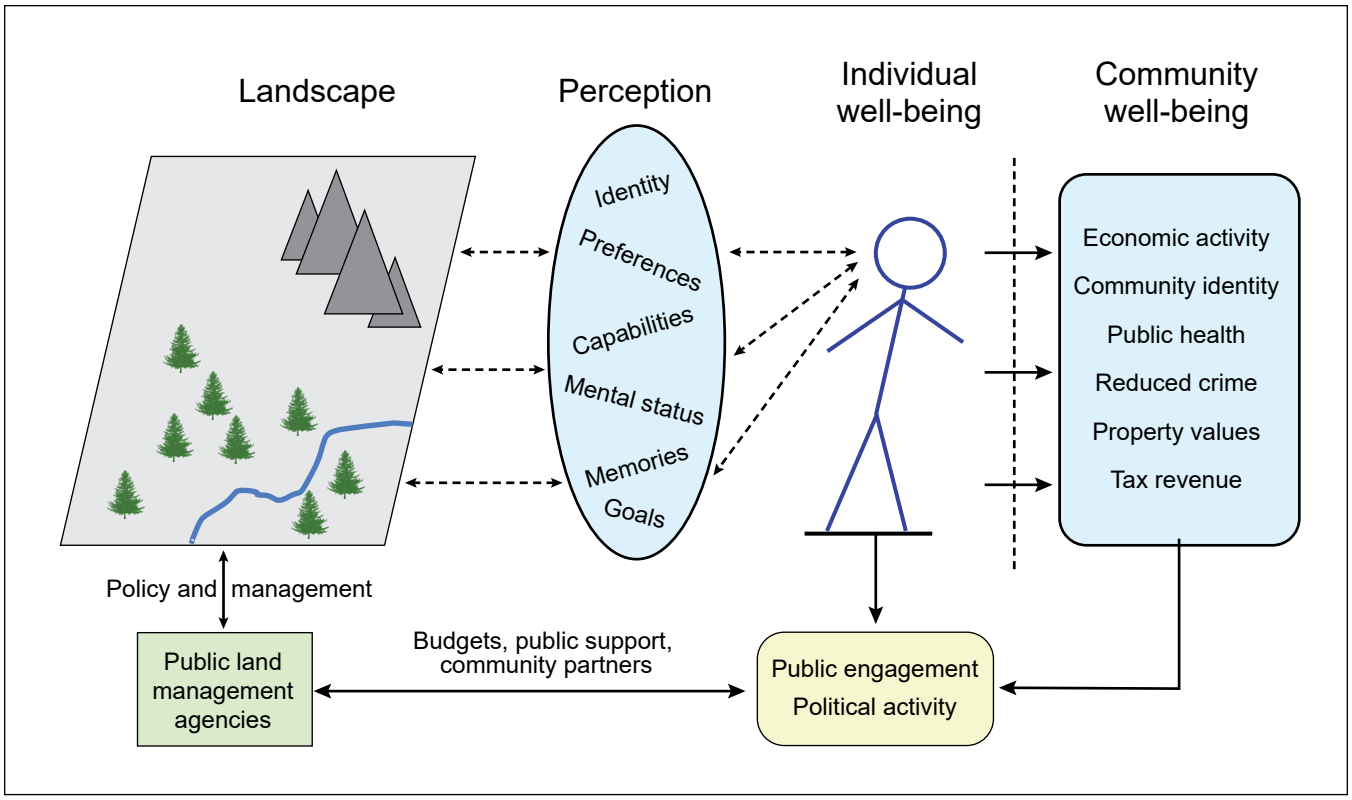

Figure 12.1—Sample socioeconomic interactions between people and a landscape (Kline 2018).

processes and interactions may also manifest differently at varying spatial and temporal scales. These problems can lead to "paralysis by analysis" (Kaufmann et al. 1994, Rittel and Webber 1973), in which planning teams spend vast resources and effort collecting data in the abstract, trying to anticipate all combinations and permutations of potential data needs.

The literature is full of systems analysis and integration frameworks that are too complex for most practical applications. Many start with an "assessment" process with long standardized lists of system characteristics, variables, and relationships that are hypothesized to be generalizable metrics and universal system components (e.g., Guerrero and Wilson 2016, Ostrom 2009). To be inclusive and consistent across many landscapes and planning units, much effort may be spent on data summaries that are detailed and cumbersome, with little thought to integrating across the many sources of data as they apply to specific local issues, problems, or concerns. However, land management decisions are context dependent; no single social-ecological framework or set of analysis metrics is directly transferable from one landscape analysis to another (Blahna et al. 2017a, Faludi 1998, Williams 2017). There are also several smaller scale management tools that can be used to integrate social and environmental information, such as Limits of Acceptable Change (LAC),

Visitor Experience and Resource Protection (VERP), and Visitor Impact Management (VIM) frameworks in recreation. These tools are rarely used in practice, however, because they are often viewed as too complex and difficult to apply (Cerveny et. al. 2011). Additionally, they were designed to address relatively specific social or environmental impact problems and never intended for analyzing broader systems concerns that may include goals like increasing visitor access and diversity or local community economic development (Blahna et al. 2020). There is evidence that these tools can be modified to meet broader system integration needs (McCool 1994), but more research is needed.

Because complexity and novelty are characteristics of all systems, including recreation and tourism systems, it is important to take a bottom-up approach to sustainable recreation management in conservation planning that is place-based and issue specific. Future research of the success or effectiveness of such approaches can be evaluated by way of case study analysis.

New Conceptual Approaches

There is now extensive literature on cross-disciplinary integration for managing sustainable uses of public lands (e.g., Brown et al. 2010, Campbell and Sayer 2003, NRC 2002, Ostrom 2009). The sheer size and complexity of the cases and literature can be confusing and serve as a barrier to the implementation of integration principles. Therefore, we recommend taking a step back and using a more pragmatic approach as a first step (Nonaka and Zhu 2012). Because complexity and novelty are characteristics of all systems, including recreation and tourism systems (McCool 2013), it is important to take a bottom-up approach to sustainable recreation management in conservation planning that is place-based and issue specific. Future research of the success or effectiveness of such approaches can be evaluated by way of case study analysis.

Issue-based planning and decisionmaking—
Issue identification and framing must serve as the first and foundational step for any planning or decision situation, not data collection or assessment as many landscape planning processes are structured (Bardwell 1991, Clark and Stankey 2006). Issues are explicit statements of environmental or social problems or conflicts related to the plan or management decision context (Blahna et al. 2017a). Although coarse-filter landscape and social data and expert judgment can be used to help identify and frame the issues, the issues provide the structure and focus for selecting the key social and environmental data needs, analysis and integration methods, and public engagement and governance processes (Blahna et al. 2017a, Williams 2017).

An issue-based planning process was recently used in the development of an "implementation strategy" for the Prince William Sound (PWS) Human Use Framework in south-central Alaska (Blahna et al. 2017b, Poe and Gimblett 2017). At the outset, the PWS framework was a "framework" in name only. Thirty years of social and environmental data, public engagement, and stakeholder meetings and

introspective essays, collected since the Exxon Valdez oil spill occurred in 1986, were uploaded to a PWS framework website. Thousands of pages of studies were cataloged on the website, but there was little synthesis across the studies. Five key issues were identified as human use sustainability threats to PWS (e.g., visitor use conflicts with Alaska Native heritage sites), and existing social and ecological data were integrated to help frame each issue and to identify management objectives and practical management actions and monitoring strategies for each issue. Sustainable recreation was defined as maintaining or increasing existing recreational uses while protecting resources and social experiences. "Keystone" recreation activities that are central to the tourism and recreation in PWS were also identified and protected in the implementation strategies for each issue (Blahna et al. 2017b: 188). Conducting issue-based analyses helped address many of the traditional systems analysis problems; the selection and integration of data, the appropriate scale of analysis, stakeholder engagement processes, and adaptive management strategies were determined by the issues, not by a predefined, top-down set of descriptive system characteristics or principles.

Place-based learning and governance—
A powerful way to implement an issue-oriented approach to sustainable recreation is using place-based social learning and governance (Williams 2017, 2018). In terms of social learning, a spatial or place-based perspective helps to avoid "analysis paralysis" and integrate different sources of knowledge and ways of knowing, valuing, and acting by drawing out the local knowledge and values of place-embedded practitioners and stakeholders. For example, Collins (2014) applied a spatial approach to social learning (referred to as learning catchments), in which learning processes build around the shared geographic context of place-embedded stakeholders as well as the ecological and social conditions associated with a specific water catchment. Collins argued that place-based social learning helps transcend systems complexity, uncertainty, and controversy by focusing on the coproduction of catchment-specific knowledge that explicitly recognizes and makes sense of the partial understandings and varying norms and values of the various stakeholders embedded in a given situation or context. In Collins' view, system-level **social** learning involves (1) the co-creation of knowledge; (2) a convergence of goals, purposes, criteria, and knowledge that contributes to awareness of mutual expectations and relational capital; and (3) changes in behavior and understanding gained through doing, that leads to concerted action. In other words, place-based social learning is as an emergent "process of multiple stakeholders socially constructing an issue in which their understandings and practices change so as to transform a situation or concern" (Collins 2014: 238).

Similar to social learning, the idea of adaptive environmental governance has been used to describe a shift away from the traditional approach to governance as a top-down system of rule-based, formal, and fixed institutions with clear boundaries and toward less formal and more flexible bottom-up approaches that can deal with highly contextualized landscape-scale problems (Koontz et al. 2015). Despite differences among stakeholders regarding local knowledge, uses, and values for a landscape, their codependence or shared habitation of a given geographic space promote greater collaboration because decisions matter at a local level that is understandable to local actors in ways that at a larger (e.g., state or national) scale are often too remote and obscure to engage any but the most organized interest groups. As the thinking goes, managing complexity necessitates locally oriented governance practices in which emergent networks of individuals, organizations, agencies, and institutions come together into learning communities and bring together various forms of knowledge, expertise, and experience to produce shared understandings, policies, and plans (Williams 2018). Sustainable recreation in this context is not so much a matter of getting policies and plans correct, but the capacity for continuous learning in a given place or landscape.

Case study analysis—

Case study analysis can be a valuable tool for encouraging social learning and evaluating place-based conservation efforts.

Lee (1993) and Williams (2017) contend that case study analysis can be a valuable tool for encouraging social learning and evaluating place-based conservation efforts. Case study research is the detailed examination of the histories of many individual cases (e.g., projects, treatments, policies) that have similar goals to evaluate the effectiveness of the outcomes of the cases (Thomas 2016). The goal of case study research is to examine enough cases to develop general principles or practices for meeting the desired goals. In medicine, for example, different drug regimens are reviewed for health outcomes. In business management, different leave policies can be reviewed for meeting employee health or productivity goals. Comparative case study research is used as a formal analytic approach in other professional practice disciplines like medicine, law, and business, but is used only sporadically to evaluate outcomes of conservation efforts (Berkes and Folke 2000, Lee 1993, NRC 2002).

Comparative case study research is used as a formal analytic approach in other professional practice disciplines like medicine, law, and business, but is used only sporadically to evaluate outcomes of conservation efforts.

We believe that systematic case study research with a well-focused learning strategy can be used for evaluating sustainable recreation projects within the broader context of landscape conservation. For example, Keough and Blahna (2006) identified four successful cases of sustainable recreation management projects that sustained (or increased) recreation use levels while **simultaneously** reducing environmental impacts. The case histories were compared to eight different

ecosystem management (EM) criteria from the literature that were hypothesized to lead to sustainable recreation outcomes, including use of "multidisciplinary data" and addressing "integrated and balanced goals" (meaning that project goals were designed to meet social, ecological, and economic outcomes simultaneously, and those outcomes were maintained over time) (Keough and Blahna 2006: 1375). Each successful project included between six and eight EM criteria, and each case met all the criteria that were relevant depending on the context. Blahna (2007) also described two case studies of landscape-level recreation projects in Utah national forests: the development of an all-terrain vehicle trail on the Cedar City Ranger District (Dixie National Forest), and implementation of a rock climbing zoning strategy in Logan Canyon (Wasatch Cache National Forest). Both projects were opposed by environmental groups that wanted recreation use restrictions because they believed that high recreation use levels caused the biophysical impacts. However, by implementing better visitor management practices, rather than reducing the number of users, the projects did reduce environmental impacts, thus simultaneously sustaining recreation and environmental conditions. Rather than focusing on protecting recreation use **or** environmental protection, management practices were designed that met integrated decisionmaking goals of EM (fig. 12.2).

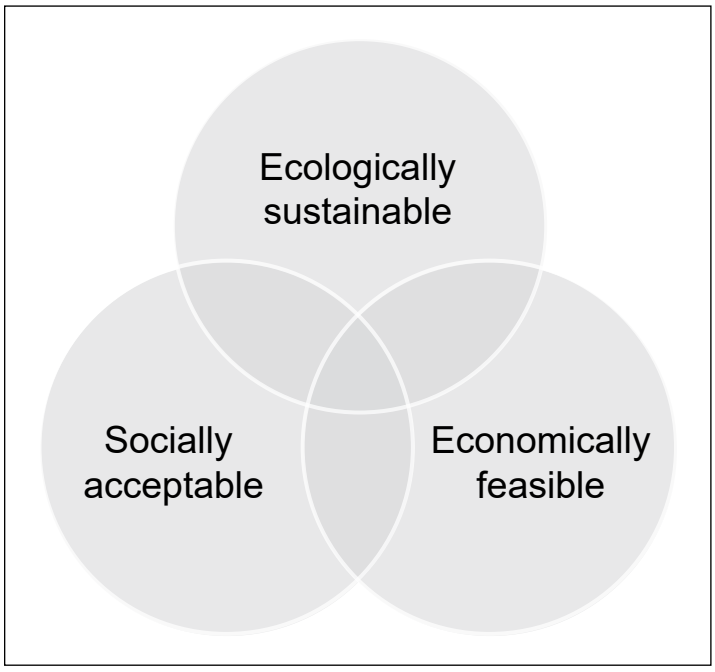

Figure 12.2—Ecosystem management decision criteria.

Conclusions

If a primary objective of sustainable recreation is sustaining **both** recreation experiences **and** environmental conditions while encouraging increasing recreation use and visitor diversity, we know little about how to integrate with broader system resilience objectives. And goals conceived in this way will require newer and more integrated sets of principles and practices than are currently available to managers. Existing recreation management tools are limited, and existing large-scale planning and decision frameworks tend to be very complex and based on generic systems characteristics and standardized metrics, rather than context and place-specific issues (Blahna et al. 2017a). Different research approaches are needed to develop a new generation of integrated principles and practices.

Coarse-filter, top-down data, and system characteristics are needed for understanding general system characteristics and sustainability problems, but individual issues are used to determine specific analytic, learning, and even governance needs.

We contend that it is more effective to take a bottom-up, context-specific approach that is driven by key sustainability issues, rather than a top-down, large-scale systems- or metrics-driven approach. Coarse-filter, top-down data, and system characteristics are needed for understanding general system characteristics and sustainability problems, but individual issues are used to determine specific analytic, learning, and even governance needs. This requires a place-based orientation that serves to focus the system analysis, as well as to use shared learning and governance that are critical for practical decisionmaking, implementing management actions, and ensuring the long-term success of any social-ecological sustainability plan. With this orientation, system components as described by McCool and Kline (2020) can be viewed as heuristics or conceptual aids for scoping data needs and integrative analyses, rather than a detailed map or explicit descriptive model of every landscape element and interaction analysis.

Compelling Questions

1. How can we reorient or adjust agency culture from a “normal science” or data-driven way of thinking, to a more issue-focused and system-oriented approach that is equally rigorous but more decision relevant?
2. How are sustainable recreation issues defined and used to identify relevant social, economic, and ecological data, as well as the expertise and interdisciplinary team composition needed for planning and decisionmaking?
3. What are key criteria for understanding how to integrate social, ecological, and economic factors and link them to sustainable recreation outcomes and goals?
4. How can case study analysis be used to address questions 2 and 3?
5. What are effective evaluation criteria for measuring long-term outcomes of integrated systems analysis in decisionmaking and planning for sustainable

recreation (e.g., shared and bottom-up learning, place-based, transdisciplinary, integrative).

6. How can research and case studies be designed so that results can help public land managers leverage people's enjoyment and fundamental interactions with natural places to build resiliency in social-ecological systems and to restore and sustain these natural places and the communities that are affected by them?
7. How can we build management models of social-ecological systems that allow for self-organization, structural change, resiliency, and desired emergent properties?
8. What kind of data integration opportunities are available and practical for mid-level managers to use given their governance structures and decision contexts?

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Chapter 13: Organizational Change and Operationalizing Sustainable Recreation—Lessons Learned From Two Natural Resource Governance Cases

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> There is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things.
>
> —Niccolò Machiavelli

Purpose

This chapter synthesizes the organizational change literature germane to adaptive change in public-sector organizations. Specifically, we analyze the organizational changes needed to integrate sustainability into government-sponsored science, analytic planning tools, and management best practices. Next, a common set of organizational change factors are posited that contribute to successful change in public-sector organizations. These organizational change factors are elaborated by examining two descriptive organizational change cases from the natural resource governance field—first, the case of organizational change within the U.S. Fish and Wildlife Service after the agency adopted an "ecosystem management" approach and, second, the case of the Forest Service's agency mandate to adopt a "sustainable recreation" approach to managing recreation throughout the National Forest System (NFS). We conclude with implications for interagency resource managers and change agents as well as for future research in this area.

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Problem Statement and Organizational Barriers

Public-sector organizations are under increasing pressure to continually adapt to a complex world characterized by rapid social and ecological change, financial austerity measures, and a more pluralistic and connected public.

Public-sector organizations are under increasing pressure to continually adapt to a complex world characterized by rapid social and ecological change, financial austerity measures, and a more pluralistic and connected public. It is, therefore, not surprising that the topic of organizational change dominates both the management and organizational behavior literature (Fernandez and Rainey 2006). However, it is easier to discuss and make plans for organizational change than to implement it on the ground. In fact, Wilson (1989: 221) has argued:

> We ought not to be surprised that organizations resist innovation. They are supposed to resist it. The reason an organization is created is in large part to replace the uncertain expectations and haphazard activities of voluntary endeavors with the stability and routine of organized relationships. The standard operating procedure (SOP) is not the enemy of an organization; it is the essence of organization.

Implementing organizational change is especially challenging for large government bureaucracies that were founded under a traditional command-and-control and hierarchical system of organizational management and in which demands for equity are easily enforced. Public managers and organizational scholars alike are experimenting with strategies designed to help public-sector organizations to become learning organizations—ever more nimble, responsive, and adaptive to changing societal conditions (Senge 2006). However, such organizations must overcome many organizational barriers to navigate this transition.

Integrating sustainability science, analytic tools, and management best practices into large public-sector organizations is challenging. Some of the organizational barriers to integrating sustainability include lack of clarity in definitions of sustainability concepts and outcomes, entrenched organizational culture, resistance to change, and lack of systems thinking (Cortner et al. 1998, Danter et al. 2000, Duarte 2015, Fernandez and Rainey 2006, Winter and Burn 2010). Given these significant barriers to organizational change, it is essential that strategies designed to foster organizational change be included in any strategic initiatives to integrate sustainability into public-sector organizations.

Fostering Successful Organizational Change

Given the significant barriers to organizational change discussed above, it is not surprising that a considerable body of knowledge has built up around the topic of how to successfully foster or manage organizational change in large, public-sector organizations. In fact, Van de Ven and Poole (1995), in their organizational theory

literature synthesis, documented more than 1 million articles on the topic of organizational change. Although some theorists have portrayed the organizational change process as a linear process characterized by orderly steps (Kotter 1995), we view organizational change as a highly complex, dynamic, and iterative process as the organization adapts and learns from both internal and external stimuli and forces (Fernandez and Rainey 2006).

Despite the breadth of academic and professional interest in organizational change, there appears to be a significant degree of consensus about a shared set of organizational factors that contribute to the fostering of successful organizational change. In the following section, we elaborate those common change factors relevant to integrating sustainable recreation practices across public land management agencies. The following is a set of nine organizational change factors that have been adapted from the work of Kotter (1995) and Fernandez and Rainey (2006):

1. Establish a sense of urgency.
2. Form a powerful guiding coalition.
3. Develop a plan.
4. Build internal support.
5. Ensure top-management support.
6. Build external support.
7. Create short-term wins.
8. Leverage resources to implement change.
9. Institutionalize change.

Establish a sense of urgency—
Research has shown that agency leaders must aggressively identify and communicate the need for change (Fernandez and Rainey 2006, Kotter 1995) to persuade employees and external stakeholders that change is needed. This sense of urgency is often communicated in dramatic terms such as the loss of agency income unless everyone cooperates aggressively to implement needed changes. The crafting of a compelling vision of a preferred future is a critical step in this change process in which leaders communicate a vision that offers employees relief from worry and discomfort. Evidence also supports the need to engage employees and stakeholders broadly in a continuing dialogue about the opportunities to be realized through this change process.

Form a powerful guiding coalition—
Kotter (1995) found that successful organizational change initiatives may start with just one or two key change agents. These "fixers" often have a unique ability to catalyze disparate actors by leveraging close personal ties and informal avenues of

influence. However, over time, the leadership coalition must grow for the recommended changes to be institutionalized. Although senior management officials often form the core of these leadership groups, the guiding coalition will also include members outside this senior management core, including external stakeholders. Because of this inside-outside membership structure, these leadership coalitions often operate outside the normal agency hierarchy structure. As Kotter (1995: 4) posited, "Reform efforts generally demands activity outside of formal boundaries, expectations, and protocols." The leadership coalition plays a key convener role, bringing stakeholders together to develop a shared assessment of the agency's problems and opportunities, as well as building trust and communication. Successful leadership coalitions provide the change process an air of legitimacy.

Develop a plan—
Fernandez and Rainey (2006) observed that successful leadership coalitions are able to translate a compelling vision for change into a more practical course of action or strategy for implementing change. This strategy has concrete, measurable goals and a plan for implementing those goals. The strategy document serves as a roadmap for the agency, providing direction for how to institutionalize the desired agency changes. It is imperative that this change strategy rest on a foundation of very specific implementation goals and a sound causal theory to avoid ambiguity and confusion over how the strategy should be interpreted and implemented at different levels of the organization.

Build internal support—
Both Kotter (1995) and Fernandez and Rainey (2006) emphasized the importance of building internal agency support for proposed changes through widespread participation in the change process. This participation should include employees from different levels of the organization at each stage of the change process. Influential employees who may be disaffected by the proposed changes should be especially cultivated. At this stage of the change process, the leadership coalition is facilitating a political process of nurturing agency support for change. Van de Ven and Poole (1995) found that a crisis or external challenge to the agency often contributes to reducing opposition to change within the agency. Couching proposed changes in the supportive language of pride in the agency's history and performance can also build internal support for change. However, both Kotter (1995) and Fernandez and Rainey (1996) asserted that widespread participation is not a panacea. Participation must be coupled with upper management support for proposed changes to be institutionalized.

Ensure top-level management support—
Although the role of individual change agents and leadership coalitions are critical to success, it is essential that upper management believes in and supports the change

process. Fernandez and Rainey (2006) reported that, in the public sector, while the change process may be led by career civil servants, it is important that top-level civil servants and politically appointed executives be cultivated throughout the change process. There is some empirical evidence (Barzelay 2001) that change initiatives have failed precisely because of a lack of support from top-level management.

Build external support—
Successful change efforts in the public sector often cultivate key external interest groups and political actors during the change process. These stakeholders may control statutory policy changes needed to support proposed changes as well as the flow of resources needed to implement these changes. Fernandez and Rainey (2006) also pointed out that these political actors may also have the power to appoint top agency leaders who are sympathetic to the proposed agency changes. External support for agency change also applies to key interest groups such as industry associations or conservation coalitions that are politically engaged and influential. By cultivating these external groups, change actors can leverage the support of key political actors and politically appointed executives. Contrarily, not engaging these external stakeholder groups can lead to dissatisfaction and criticism of the change process.

Create short-term wins—
Kotter (1995) noted that successful change initiatives find ways of creating short-term goals, projects, and wins that serve to maintain and build momentum and institutional support for proposed changes. Institutional change can take several years to implement. Shorter term annual change projects, strategies, and programs can build a sense of optimism and hope around proposed changes and reduce the number of defectors from the leadership coalition. Although career civil service employees may complain about having to produce short-term projects, they can serve a vital purpose in an agency change initiative. Short-term wins can maintain the urgency surrounding change efforts and increase the chances that agency change will eventually be institutionalized.

Leverage resources to implement change—
Leadership coalitions supporting change must leverage scarce organizational resources to support the change process (Fernandez and Rainey 2006, Kotter 1995, Van de Ven and Poole 1995). Change is not cheap. Resources must be allocated and, at times, redirected from existing programs to support new activities such as training employees, implementing new programs, and restructuring the organization. Resources are needed to provide the agency with the administrative and technical capacity to implement the proposed changes. There are significant financial tradeoffs to be made in implementing change. Failure to provide adequate resources often leads to weak implementation and loss of momentum for the change initiative.

Institutionalize change—
For organizational change to be institutionalized, it must be firmly embedded in in an agency's culture (Fernandez and Rainey 2006, Kotter 1995). This means that proposed changes need to be rooted in the social norms, shared values, and, ultimately, the daily routines of employees. Empirical evidence supports several strategies to accomplish this objective. First, it is critical that change advocates demonstrate how the new approaches are improving the performance of the agency. An ongoing communications program will be necessary to reinforce these messages and establish a new set of social norms and daily routines. Change advocates also need to ensure that the next generation of upper management officials for the agency personify the new approaches. In fact, one poor succession decision at the top of an agency can set back years and years of change progress. Finally, it is also important that change advocates collect data and monitor the change implementation process to ensure that proposed changes are being fully adopted. In the public sector especially, frequent changes in political leadership can set back change initiative dramatically.

Strategies to foster successful organizational change can be illustrated by examining concrete cases in which agencies have worked diligently to institutionalize positive agency change. Below, we examine two such agency cases, providing a contextual background to the change initiative, summarizing barriers faced in pursuing successful organizational change, and assessing agency change strategies employed and prospects for positive agency change in the future.

Case #1: ecosystem management and the U.S. Fish and Wildlife Service—
Danter et al. (2000) analyzed the organizational changes desired by the U.S. Fish and Wildlife Service (USFWS) to implement an "ecosystem management" approach to natural resource management during the 1994–1998 period. From their organizational assessment, Danter et al. (2000) observed that adopting ecosystem management required a number of significant organizational changes within the USFWS including (1) changes in professional emphasis, (2) changes in the level of interdisciplinary collaboration needed, (3) changes in the role and style of agency decisionmaking, and (4) changes in organizational values and culture. Efficiency and rational planning approaches, traditionally valued by many natural resource agencies, had to give way to systems thinking, flexibility, adaptive management, and responsiveness—a tall order in any large bureaucratic agency.

Efficiency and rational planning approaches, traditionally valued by natural resource agencies, gave way to systems thinking, flexibility, adaptive management, and responsiveness.

Danter et al. (2000) also identified a number of organizational barriers to adopting an ecosystem management approach agencywide. The bureaucratic structure of resource management agencies tends to resist change and new information. More specifically, organizational resistance to change occurred as

traditional natural resource management fields made room to include emerging disciplines such as conservation biology and applied ecology. Further, a growing emphasis on interdisciplinary collaboration challenged traditional organizational norms that tended to compartmentalize information along strictly disciplinary lines. An emerging emphasis on interdisciplinary collaboration involved a fundamental shift in agency culture, power relationships, and professional norms. In interviews with USFWS employees and external stakeholders, Danter et al. (2000) also found that many USFWS personnel were confused about the ecosystem management approach. Lack of clarity about its definition and lack of personal involvement in change processes led to unfavorable opinions about the ecosystem management approach.

Faced with these protracted agency barriers and recognizing that the ecosystem management directive had only partially been institutionalized, the USFWS contracted with Danter et al. (2000) to conduct a formative organizational assessment of the status of ecosystem management implementation and what actions were needed to accelerate full implementation. The consulting team found that many of the organizational change factors identified in table 1 had not been accomplished. A sense of urgency had not been established because the reason for adopting ecosystem management had not been clearly articulated to employees. Efforts to form a powerful guiding coalition had been held back owing to the fact that not all USFWS Directorate members supported the ecosystem management directive. Not unexpectedly, the consulting team found that a clearly articulated vision had not been established and communicated widely across the agency. As mentioned above, many employees were confused and uncomfortable with the lack of direction and communication needed to empower personnel to act on the ecosystem vision and to create the short-term wins necessary to fully institutionalize the ecosystem management approach.

Based on results from the organizational assessment, the directorate took a number of concrete steps to accelerate the agency transition to ecosystem management. That included developing and sharing agencywide a new vision statement. The directorate also committed to holding all levels of leadership accountable for communicating the action plan to fully implement the ecosystem management approach. In addition, the directorate committed to provide the necessary training, development, and rotational assignments to ensure that the ecosystem management approach was fully implemented. From a research and monitoring perspective, it would be interesting and strategic to conduct a followup organizational assessment to understand the contemporary dynamics of how the ecosystem management approach is currently being integrated into USFWS operations.

Case #2: Sustainable recreation and the U.S. Forest Service—Our second organizational change case study comes from the Forest Service and its agencywide efforts to integrate sustainable recreation into the NFS. Although no study has specifically addressed the organizational changes necessary to implement sustainable recreation in the Forest Service, many of these organizational change dynamics can be evidenced through the empirical and professional literature on sustainable recreation (Collins and Brown 2007; Selin 2017, 2018). The context for examining organizational change and sustainable recreation in the Forest Service is embedded in the challenges and opportunities that federal land management agencies like the Forest Service face in enhancing recreation opportunities. For example, the number of recreation visits to our 154 national forests has grown from about 5 million visits in 1925 to 149 million visits today (USDA FS 2017). Population growth and increased urbanization has severely tested the Forest Service's recreation infrastructure and dedicated workforce (Collins and Brown 2007).

The context for examining organizational change and sustainable recreation in the Forest Service is embedded in the challenges and opportunities that federal land management agencies face in enhancing recreation opportunities.

The challenges of responding to these external pressures on service delivery has been complicated by the reality of fiscal scarcity. Agency recreation budgets have been flat, or declining. For example, wildfire-related investments have captured over half of the Forest Service budget (USDA FS 2015). According to one recent Forest Service report, the Recreation, Heritage, and Wilderness Program budget has declined by nearly $95 million between fiscal years 2011 and 2016, an 18 percent decrease (USDA FS 2017). According to this same report, the number of full-time employees in the Forest Service's managed recreation program has declined by nearly 30 percent since 2002.

These challenging social and economic forces have provided considerable urgency to agency efforts to implement more sustainable approaches to managing outdoor recreation on public lands. In the Forest Service, this sense of urgency was formalized in 2010 with the systemwide release of the Framework for Sustainable Recreation (FSR) (USDA FS 2010). The FSR communicated the broad challenges and opportunities facing the Forest Service's managed recreation program, a vision, guiding principles, goals, and recreation focus areas. Recreation focus areas included priorities such as restoring and adapting recreation settings, implementing "green" operations, forging strategic partnerships, promoting citizen stewardship, developing a stable financial foundation, and developing the agency's recreation workforce.

Over the past 5 years, the Forest Service Washington office has developed an FSR Implementation Guide that provides guidance, tools, and lessons learned to Forest Service regions and individual national forests. In addition, a number of Forest Service regions have developed their own sustainable recreation strategies,

tiered to the national FSR, and individual forests are now striving to implement their own sustainable recreation action plans as well (Selin 2017). Enhancing recreation opportunities, improving public access, and sustaining recreation infrastructure were recently identified in five agency priorities published by the Forest Service (USDA FS 2017). Implementing the FSR across the agency can be viewed as a significant organizational change initiative that would benefit from adhering to the organizational change factors identified above.

Clearly, implementing sustainable recreation throughout the NFS presents significant organizational challenges and barriers that have not been adequately analyzed or reported (Selin 2018). Perhaps the greatest challenge is overcoming the limited financial, human resource, and technical capacity that the Forest Service managed recreation program brings to this agency's sustainable recreation objective. One agency report concluded that the FSR has not been fully implemented owing to the lack of a focused financial investment (USDA FS 2017). Other internal barriers to implementing the FSR include cultural factors such as elevating the status of the managed recreation program to be equal to such other resource management objectives as ecological restoration, wildlife management, and silviculture. Finally, agency leaders at all levels must be held accountable to support the hiring, training, and financial investments needed to fully implement sustainable recreation (Selin 2018).

More deliberate organizational assessment is needed to prescribe effective strategies to fully implement sustainable recreation across the NFS. This type of assessment would benefit the Forest Service and other public land agencies striving to implement sustainable recreation on public lands.

Compelling Questions

Integrating sustainability science and best practices into public-sector organizations will be challenging. The organizational change literature suggests several compelling research questions that should be explored further to advance organizational change theory and practice:

1. What is the current organizational status of implementing sustainable recreation across public land management agencies such as the Forest Service? Can a formative comprehensive organizational assessment help chart the way to accelerate organizational change initiatives?
2. How does ingrained organizational culture either advance or constrain organizational change initiatives like the Framework for Sustainable Recreation in the Forest Service?
3. What key characteristics of organizational leadership influence the direction of sustainable recreation change initiatives?

4. What type of incentives can be offered to employees to foster desired sustainable recreation change objectives?
5. How does a clear, compelling vision for change translate into building internal and external support for sustainable recreation change initiatives?
6. What lessons can be learned from current sustainable recreation change initiatives that can be translated into organizational change best practices?
7. How can the monitoring of sustainable recreation change initiatives identify those internal and external factors that either tend to constrain or foster organizational change?

Conclusions

Applied social science research can inform decisionmaking through ongoing monitoring of change initiative outcomes and consequences.

Public sector organizations are under societal pressure to adopt sustainability practices. Evidence from the organizational change literature suggests that there is considerable consensus around a set of organizational factors that tend to foster successful organizational change. There is also a need to better understand those organizational factors that tend to constrain successful organizational change. Applied social science research can inform decisionmaking through ongoing monitoring of change initiative outcomes and consequences. The sustainable recreation efforts of U.S. public land management agencies provide an opportunity to address agency needs while testing a specific model of organizational change. We believe that data-driven decisionmaking can build up a set of best practices to inform future organizational change initiatives.

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Part IV: How: Practical Tools

Chapter 14: How Can Collaboration Contribute to Sustainable Recreation Management?

Steven Selin, Dale J. Blahna, and Lee K. Cerveny[1]

> We just have a whole diverse range of partners when it comes to outdoor recreation, and we want to work in the spirit of shared stewardship. We want to work collaboratively to make a difference.
>
> —Tony Tooke, former Forest Service Chief, January 28, 2018 (Blevins 2018).

Purpose

This chapter examines the potential that collaboration holds for operationalizing sustainable recreation management on public lands. Additionally, we synthesize the professional and academic literature on collaboration and partnerships to spotlight promising new conceptual frameworks, analytic tools, and management best practices that can contribute to this goal. Finally, we identify a research agenda that can assess the efficacy of collaborative approaches to outdoor recreation governance, planning, and management. Continuous monitoring of collaboration dynamics, capacity, structures, and outcomes can contribute to sustainable recreation management into the future.

Problem Statement

Collaboration has emerged as a central focus as society negotiates new interorganizational policy, planning, and management arrangements to implement the goals of sustainable development (Koontz 2006, Lozano 2007). Further, as Ostrom (1990) aptly put it, including affected individuals in rulemaking about conservation resources is critical to building sustainable human-environmental systems. This is certainly true within the narrower domain of public land management, where collaboration has been advocated as a strategy to implement landscape restoration projects (Butler et al. 2015), construct community wildfire protection plans (Charnley et al. 2014), improve forest-level planning (Cheng and Sturtevant 2012), and enhance sustainable recreation and tourism opportunities (Selin 2017). Whether the current agency terminology is recreation partnerships, all lands–all hands, or the shared stewardship goals

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of the National Strategy for a Sustainable Trails System (fig. 14.1), most recent public land management recreation planning initiatives have emphasized collaboration as a means to implement sustainable practices on the ground (Charnley et al. 2014).

By collaboration, we mean the dynamic process by which multiple parties pool resources (e.g., information, money, labor, and time) to solve a problem or create an opportunity that they cannot solve individually (Gray 1989, Selin and Chavez 1995a). We envision collaboration as a dynamic, adaptive, and flexible process. Collaboration implies a joint decisionmaking approach in which power is shared and stakeholders take collective responsibility for their actions. However, collaborative approaches to public land management remain an under-researched and contested alternative to more traditional agency-control models of decisionmaking and service delivery. Needed are more science-management partnerships in which collaboration dynamics,

Figure 14.1—Collaboration model from the U.S. Department of Agriculture Forest Service National Strategy for a Sustainable Trail System (USDA FS 2017).

forms, and outcomes are monitored to support social learning at all agency levels. The benefits of collaboration have been well documented: it builds trust, strengthens social capital, leverages scarce resources, reduces conflict, and gets work done on the ground (Selin and Mendoza 2013). However, there are also significant barriers and challenges to achieving the potential of collaboration (Selin and Chavez 1995a).

Barriers and Challenges

The barriers and challenges to forging effective collaboration and partnerships with recreation and tourism stakeholders have been well chronicled (Jamal and Stronza 2009, Leong et al. 2011, Selin and Mendoza 2013). Resource limitations—time, money, and personnel—are often cited by agency staff as reasons for not entering into collaborative arrangements, and yet such partnerships can help leverage personnel, equipment, and funds to help agency staff address their challenges (Selin and Mendoza 2013). Lack of ability and training is another reason given by agency staff to shy away from external collaboration. In other cases, prevailing fears, attitudes, biases, and norms stand in the way. Organizational culture and a "we know best" attitude can often create a resistance to organizational change and innovative collaboration and partnerships (Leong et al. 2011).

Other administrative, legal, and budgetary constraints can also limit the adoption of external collaboration. A perceived lack of accountability and quality control in collaborative arrangements can often slow down the implementation of these type of programs (Cheng 2007). Administrative inflexibility or "red tape" in procurement, budgeting, and legal requirements can discourage stakeholders from participating in recreation partnerships with land management agencies (Selin and Chavez 1995b). Lack of authority at a local or regional level can also constrain the implementation of collaborative arrangements as can a loss of continuity as key agency participants are transferred to other regions (Koontz 2006). Despite these diverse challenges, collaboration and partnerships are becoming more prevalent as managers and decisionmakers recognize the agency and community benefits to conservation and economic development goals that result from these coordinated arrangements.

Collaboration and partnerships are becoming more prevalent as managers and decisionmakers recognize the agency and community benefits to conservation and economic development goals that result from these coordinated arrangements.

New Concepts and Methods

Public lands collaboration is emerging across a broad spectrum of spatial and organizational scales. Collaboration may be place-based with primarily local actors, such as local Fire Safe Councils (Charnley et al. 2014). Or they may be regional, national, or even international in scope, such as the World Heritage Site program (Jamal and Stronza 2009). Collaborations may be transitory and informal or they may be more formal and result in permanent, legally mandated, interorganizational structures. Collaboration can occur within the policymaking arena; play a role in

the governance of complex, watershed systems like lakes and rivers; develop as an approach to natural resource planning; or provide a key focus in the management of place-based conservation areas.

Collaboration with a sustainability focus is being analyzed from the perspective of many disciplines including protected area management, tourism, forestry, urban studies, rural studies, and public administration. Much of this theoretical and empirical work has been focused on understanding collaboration from the perspective of a complex, adaptive system (Gray 1989, Selin and Chavez 1995a)—developing a deeper understanding of the external drivers that catalyze the formation of collaboration, analyzing the internal dynamics of how collaborative arrangements evolve over time, and assessing the benefits, costs, and outcomes resulting from collaborative approaches to public land management. Ultimately, much of this scholarly work is directed toward the question of how collaborative systems can contribute to sustainability in the broadest sense (Koontz 2006). Action-oriented research in this arena is informing policymakers and resource management agencies charged with managing these social-ecological systems. We next summarize three promising areas of collaboration research to sustainable recreation management: collaborative governance, community-based collaboration, and collective impact initiatives.

As public land management agencies look for ways to manage recreation resources more effectively and efficiently, they are exploring a host of interorganizational alternatives to the traditional agency control model.

Collaborative Governance

As public land management agencies look for ways to manage recreation resources more effectively and efficiently, they are exploring a host of interorganizational alternatives to the traditional agency control model. For example, the language of networks, public-private partnerships, and cooperative associations infuses most Forest Service plans to operationalize sustainable recreation (Selin 2017). The Forest Service partnership with the Greening Youth Foundation to support resource assistant positions across the National Forest System is an excellent example of how this type of partnership with a nonprofit organization is building stewardship capacity across the agency. However, public land management agencies are still struggling with how to be effective actors in these cross-sector, multilevel governance systems (Robertson 2011). Fortunately, these disparate ideas and best practices are being synthesized into the literature on "collaborative governance," which Ansell and Gash (2008) defined as "a governing arrangement where one or more public agencies directly engage non-state stakeholders in a collective decisionmaking process that is formal, consensus-oriented, and deliberative and that aims to make or implement public policy or manage public programs or assets" (2008: 544). The col-

laborative governance literature is generating analytic frameworks and management best practices for maximizing the value of these emerging collaborative practices.

If collaborative governance is the new social infrastructure being constructed, then "social networks" are the building blocks of that social infrastructure (Fliervoet et al. 2016). Social network analysis is emerging as a powerful analytic tool to assess and predict the functionality and performance of these collaborative social systems. One can further differentiate between the degree of "bonding" social capital and "bridging" social capital (McGehee et al. 2015) present in these collaborative systems. Bonding social capital comprises the internal relationships, networks, and trust that occur horizontally within a collaborative system. Bridging social capital is constructed when the bonded group reaches out, either vertically or horizontally, to seek information, resources, or support.

Community-Based Collaboration

Whereas collaborative governance often plays out over a regional or landscape scale, community-based collaboration happens at a local scale when groups come together to address natural resource management issues involving ecological and economic sustainability (Charnley et al. 2014, Cheng 2007, Cheng and Sturtevant 2012, Margerum 2007). Community-based collaborative groups are playing a more prominent role in natural resource management, from planning to project implementation to monitoring and assessment activities (Cheng and Sturtevant 2012). In fact, a number of recent federal policies and programs, such as the Collaborative Forest Landscape Restoration Program (Butler et al. 2015), are incentivizing the participation of community-based collaborative groups as partners in landscape restoration projects. Much of the scholarly work in this area focuses on understanding and supporting capacity-building efforts of this community-based collaboration sector (Cheng and Sturtevant 2012, Margerum 2007, Mountjoy et al. 2013). Considerable political deliberation centers on strengthening the role of these community-based collaborative groups and on whether current environmental laws governing public forests are constraining the full application of community-based collaboration (Nie and Metcalf 2016). Although most stakeholders see a significant role for community-based collaboration, a competing point of view is that collaboration is no substitute for agency accountability. Proponents see limits to the utility of collaboration, pointing out that collaboration processes must work within the bounds of public accountability and scientific scrutiny and wider opportunities for public participation afforded by the National Environmental Policy Act process. Further research is needed to determine the appropriate and legal role for community-based collaboration.

Collective Impact

Finally, the "collective impact" literature (Hanleybrown et al. 2012) is revolutionizing how we think and act about collaboration and partnerships. The authors developed a conceptual framework to describe collective impact initiatives, which they describe as highly structured collaborative efforts that have achieved substantial impacts on a large-scale social problem. Five key elements were found in all collective impact initiatives, including having a common agenda, collecting common impact measures, coordinating mutually reinforcing activities, being committed to continuous communication, and having the presence of a "backbone organization" to coordinate efforts by participating organizations. The backbone organization, which consists of only two to four staff members, is the key distinguishing feature of collective impact groups. Literally hundreds of organizations have an interest in the sustainable management for any given set of public lands, and the role of the collective impact backbone organization is **not** to actually conduct stewardship or restoration activities, but to identify, organize, and arrange funding for a logical set of partners to implement specific sustainable recreation management practices on public lands. Thus, it is an independent, boundary-spanning type of organization that seeks to implement the shared goals of all the sustainability stakeholder groups. Further, Hanleybrown et al. (2012) identified three preconditions necessary to achieving collective impact: (1) the presence of an influential champion, (2) adequate financial resources, and (3) a strong sense of urgency for change. Measured against the standards of true collective impact initiatives, many sustainable recreation partnerships clearly lack capacity at present. Although most collective impact initiatives focus on social service goals, a few backbone organizations have regional environmental sustainability goals such as the Chicago Wilderness program (Gobster 1997) and the Intertwine Alliance (DeNies 2013) operating in the greater Portland, Oregon, area. Although there are few case studies in the scholarly literature about conservation backbone organizations, the collective impact literature provides powerful lessons for aspiring resource managers and conservation scholars.

Compelling Questions

This growing body of knowledge on collaboration and partnership dynamics has generated significant and compelling research questions—

Contextual factors—

1. What are the underlying initiating factors that lead to the formation and persistence of enduring recreation partnerships?

2. What type of incentives and management guidelines can be provided to catalyze the formation and strengthening of effective recreation partnerships?
3. What significant barriers constrain the adoption of effective recreation partnerships?

Collaboration and partnership dynamics—

1. Can keys to success and lessons learned be synthesized from both successful and struggling partnerships?
2. What roles do key individuals, leaders, or changemakers play in the partnership development process?
3. Can case studies of successful collaboration and partnership initiatives be archived to support collaborative learning and training programs?

Collaboration outcomes and impacts—

1. Can we monitor and evaluate the outcomes of collaboration and partnership programs to support collaborative learning at all levels and to build recreation program capacity?
2. What contributions do collaboration and partnerships make to sustainable agency operations as well as to community resilience and livelihood?
3. What are some problematic or negative outcomes of applying collaboration to sustainable recreation and tourism management?
4. Can we develop effective training programs to build the competency and confidence of agency staff and public and private sector collaborators to facilitate enduring recreation partnerships?

Conclusions

Clearly, the transition to more collaborative approaches to managing public lands recreation will be challenging. Building effective partnerships and strengthening collaboration with external stakeholders including other public agencies at all levels of government, recreation user groups, nongovernmental organizations, foundations, academia, and the corporate sector holds part of the answer to this challenge. Collaboration research may inform and strengthen agency efforts to build effective and efficient external collaboration and to support collaboration training. Collaboration and partnership dynamics are a complex and dynamic endeavor. Building a toolbox of best practices, capacity building approaches, and leadership strategies is essential to this task. Social science research and engagement is needed to study collaboration in action and illuminate strategies for success.

Social science research and engagement is needed to study collaboration in action and illuminate strategies for success.

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Chapter 15: National Forest Planning: Applying New Technologies and Approaches to Improve Public Participation and Decisionmaking

Levi Rose, Jonathan Hallemeier, and Kevin Colburn[1]

> Maps are like campfires—everyone gathers around them, because they allow people to understand complex issues at a glance, and find agreement about how to help the land.
>
> —Sonoma Ecology Center

Purpose

This chapter explores how changes in 2012 to the U.S. Forest Service's land and resource management planning rule transformed the orientation of forest planning from being agency driven to becoming more collaborative and offering greater opportunities for public participation. We also highlight new technologies and approaches to reduce conflict among wide-ranging interests in the planning process. In closing, we provide insight on lessons learned from the Nantahala-Pisgah forest plan revision process that might inform how citizens advocate for their values in future forest plans, including sustainable recreation.

Problem Statement

Across the United States, many national forests are in the process of revising their forest plans. Forest planning can be complicated, and there is a learning curve for citizens who are new to the process. Those seasoned in forest planning will notice key differences under the new planning rule, like increased opportunities for public participation. Horelli's (2002: 620) definition of participatory planning elaborated on this process in more depth: "Participatory planning is a social, ethical, and political practice in which individuals or groups, assisted by a set of tools, take part in varying degrees at the overlapping phases of the planning and decisionmaking cycle that may bring forth outcomes congruent with the participants' needs and interests." In the past, the Forest Service has used various methods to drive public participation, such as workshops, charrettes, open houses, and public meetings; however, these methods have not attracted large numbers of participants (Brown et

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al. 2014, Laurian 2004). Although these methods can be valuable, especially during certain phases of the planning process, the downside is that the location and time commitment of these methods reduce the number of participants and highlight the exclusive nature of participation (Kahila-Tani et al. 2016). This observation, in combination with agency staffing and budget constraints, tends to direct the focus on fulfilling the participation requirement in accordance with regulations and neglects the quality and effectiveness that the participation process could provide. Recent studies by Brown and Kytta (2014) suggested that a public participation geographic information system (PPGIS) has the potential to reach a larger spectrum of the public during land use planning processes compared to traditional methods. Although participation opportunities have increased through recent changes in the planning rule, the influence of participation on decisionmaking and actual outcomes remains under-researched, and systematic evaluation is needed to better understand how public participation affects forest planning outcomes.

Dimensions of the Problem: Opportunities for Public Participation

The National Forest Management Act (NFMA) of 1976 requires land and resource management plans to be prepared by each of the 154 national forests (referred to as forest units) in the 193-million-ac (78-million-ha) National Forest System (NFS). NFMA requires promulgation of regulations to govern the planning process, and the NFS Land and Resource Management Planning Rule of 1979 (hereafter, the planning rule) directs the land use planning process for all forest units. Regulations adopted in the 1982 planning rule helped guide many of the forest plans that are currently in use today. Since its inception, suggestions for improving the planning rule were collected and first published by the Forest Service (USDA FS 1990) in its *Synthesis of the Critique of Land Management Planning.* This critique highlighted 232 recommendations and was "designed to focus attention on areas needing adjustment." In the "What We Experienced" section (p. 9) of the critique, the Forest Service noted that interest groups have flourished because of planning. The publication points out that "single-interest advocacy positions were vehemently expressed within the agency as well as outside it. There were relatively few advocates of multiple use in comparison." Surprisingly, a word search within the critique for "collaborate," "collaboration," or "collaborative" (as well as "partner" or "partnership") turned up zero results. The report also concluded that "Relationships are vital. People expect us to involve them, not because we are required to but because we value their contributions, and because better decisions will result." These initial insights proved to be important, and they document the beginnings of a paradigm shift from agency-driven management orientation to becoming open to the idea of

collaborative and co-management styles. The Forest Service worked to incorporate what it learned and attempted to implement new regulations in 1995, 2000, 2005, and 2008, but these regulations were promptly abandoned because of litigation. After 30 years of implementing the initial 1982 planning rule, the Forest Service issued a new planning rule in 2012 that contained many changes; here we focus on new opportunities for public participation.

In contrast to previous regulations, the new planning rule provides more opportunities for public participation, or, as Haber (2015: 6) described it, opportunities to "beef-up the process that occurs prior to NEPA [the National Environmental Policy Act]." Under the 2012 rule, the Forest Service is required to "provide opportunities to the public for participating in the assessment process, developing a plan proposal (including the monitoring program), commenting on the proposal and the disclosure of its environmental impacts in accompanying NEPA documents, and reviewing the results of monitoring information." In addition, the Forest Service is required to "engage the public…using collaborative processes where feasible and appropriate." Collaboration can come in many flavors; we define it here, as authors did in Selin et al. (2020), as the dynamic process by which multiple parties pool resources (e.g., information, money, labor, and time) to solve a problem or create an opportunity that they cannot solve individually (Gray 1989, Selin and Chavez 1995).

The enhanced public participation requirements in the 2012 planning rule create distinct opportunities for valuable engagement on outdoor recreation and specifically identifies the Sustainable Recreation Framework (NFSLMP 2012: 21162 and 21191) to guide management of resources in the NFS. Several themes contained in the planning rule are closely aligned with the guiding principles of the Forest Service *Framework for Sustainable Recreation* (USDA FS 2010). For example, the nexus between the new rule on "collaboration" and the Sustainable Recreation Framework Guiding Principles on "engaging communities" creates a fundamental principle to use in sustainable recreation planning. Under the framework of the 2012 rule, we examine ways in which participation and collaboration in forest planning can be enhanced with geographic information system (GIS) tools, and we draw lessons from an ongoing case study in the Nantahala-Pisgah National Forests.

New Approaches: Public Participation GIS and Collaborative Mapping

Analytical requirements were a core component of the 1982 regulations, and original forest plans were built by formulating reasonable alternatives according to NEPA procedures and "identifying the alternative that comes nearest to maximizing net public benefits" (National Forest System Land Management Planning 1982). The

Forest Service used a computer model called "FORPLAN" to generate recommended land allocations that optimized economic efficiency, but these models were criticized for being too time-consuming, and as Haber (2015: 7) underscored, "the 'black box' approach was a barrier to effective public involvement." Long gone are the days of FORPLAN, and instead, the Forest Service now uses mapping tools and software that the public understands and hosts GIS data that can be readily consumed.

With advances in GIS technology and the advent of Web 2.0 (websites emphasizing ease of use, user-generated content, and interoperability), Web-based mapping tools can be used to "crowdsource policy," and the Forest Service is doing just that. The Talking Points Collaborative Mapping Tool (TPCM) is an interactive online mapping tool used to enhance public involvement in forest planning (Aran and Reed 2015). TPCM was developed by the Forest Service to meet President Obama's Open Government Initiative (2009) to promote transparency, participation, and collaboration, and also satisfies the Forest Service Strategic Plan goal to "develop Internet-based tools to improve internal and external user interaction with the Forest Service and Forest Service data" (USDA FS 2015). TPCM was designed to support public participation through GIS technology by integrating non-expert, place-based knowledge and experience to help address complex land use problems. The application is currently being integrated into several forest plan revisions across the country (e.g., on the Flathead, Lewis and Clark, Manti-La Sal, and Nez Perce-Clearwater National Forests) and is an excellent example of how crowdsourced location intelligence, facilitated by online mapping tools, is enabling collaboration and public participation.

In addition to TPCM, which is primarily focused on collecting place-based knowledge and public comments, online mapping applications can be used to help work through and reduce conflict in the forest planning process. As identified by Cheng and Kruger (2008), conflict can be generated by how actors label areas on a map, such as how management areas are defined and allocated in a forest plan. Management areas emphasize specific uses and values and are often the focus of contention when other values of an area are perceived to be ignored or even threatened. Creating a shared understanding of how multiple values overlap on a landscape and what this means for management area definitions and allocations is central to forest planning. In the following case study, we show how Web-based mapping platforms, like Esri's ArcGIS® Online,[2] can help facilitate discussion and consensus among multiple interests by visualizing complex geospatial relationships at the national forest scale.

[2] The use of trade or firm names in this publication is for reader information and does not imply endorsement by the U.S. Department of Agriculture of any product or service.

Case Study: Nantahala-Pisgah Forest Plan

The Nantahala-Pisgah National Forests are located in western North Carolina, encompassing more than 1 million ac (figs. 15.1 and 15.2). They are a hotspot of biodiversity, an exceedingly popular recreation destination, a place of cultural importance for Cherokee and generational residents, and a source of forest products and clean water. The Nantahala-Pisgah is one of the most visited forests in the country, and growing development in the region is placing greater pressure on this resource. In some high-use areas of the forest, increasing enthusiasm for recreation has not been sustainably matched by capacity to maintain roads and trails. In contrast, communities around other low-use areas desire more recreational visitors. The current forest land management plan, which was approved in 1987 and heavily amended in 1994, does not provide adequate guidance for dealing with emerging

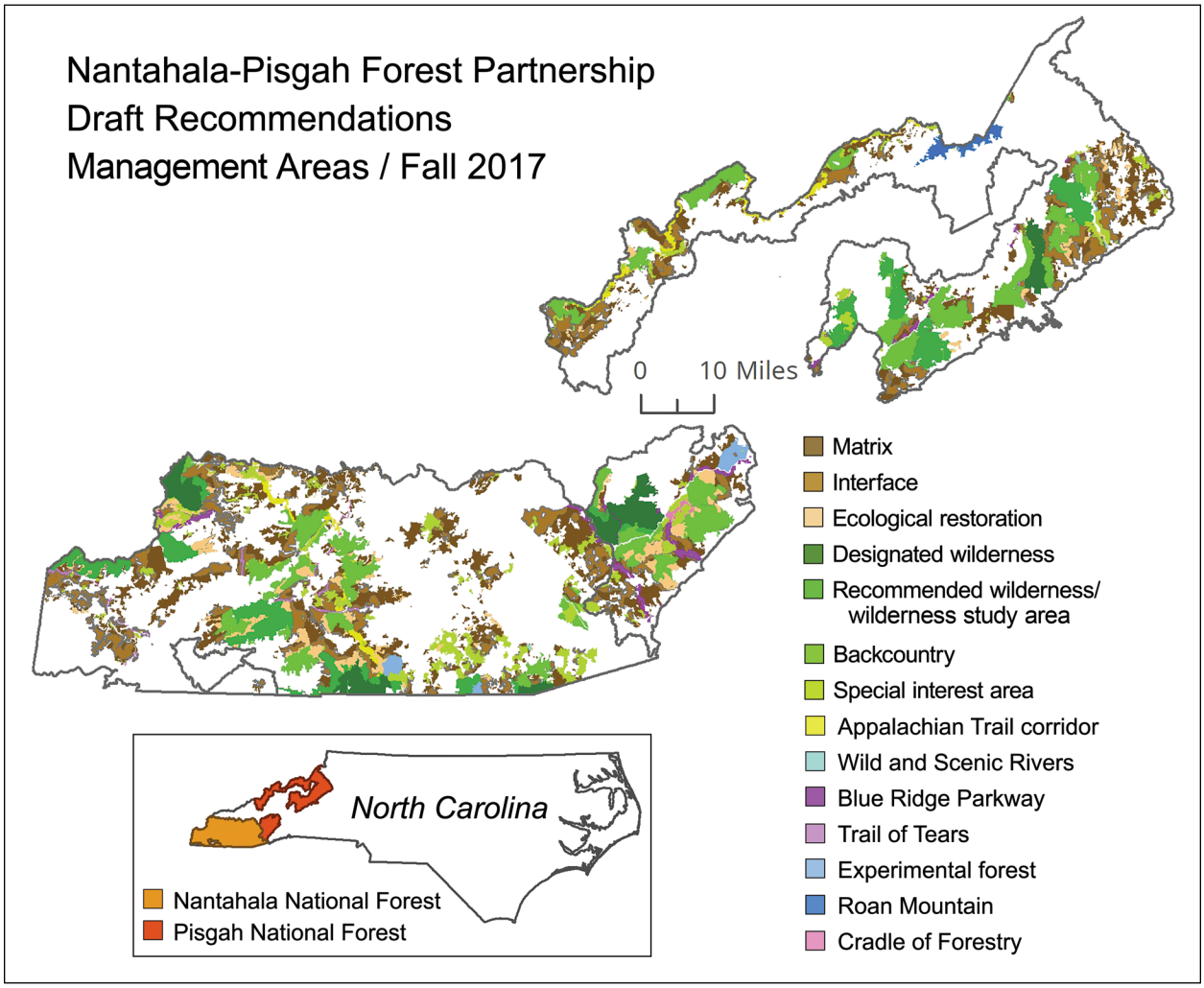

Figure 15.1—Nantahala-Pisgah forest plan revision draft recommendations, Nantahala-Pisgah Forest Partnership, fall 2017.

Jack Henderson, by permission

Figure 15.2—The Nolichucky River Gorge is located in a remote corner of the Pisgah National Forest in North Carolina near the state's border with Tennessee. The Nolichucky has collaborative support to be managed as eligible for Wild and Scenic River designation.

recreation issues. Addressing questions about how sustainable recreation will be managed in the revised plan (currently in development) is vitally important to ensure the future health of the forest and to accommodate the estimated 3.3 million visitors who recreate in the forest each year (USDA FS 2014).

The Nantahala-Pisgah is an early adopter for plan revision under the 2012 forest planning rule. The Nantahala-Pisgah planning process began in late 2012 and has given rise to multiple collaborative efforts. The Nantahala-Pisgah Forest Partnership is one such effort, formalized in early 2013. The partnership was developed independently from the Forest Service by wide-ranging interest groups seeking to work through complex and historically contentious issues collaboratively. These efforts were encouraged by changes in the planning rule and the opportunity to do forest planning in a different, less antagonistic way than in the past. Participants in the partnership range from volunteers new to the process to career professionals with decades of experience in forest planning. More than 30 active members and affiliates represent a broad cross-section of forest users and stakeholder interests,

organized into seven interest areas: conservation, cultural heritage, economic development and tourism, forest products, recreation, water, and wildlife.

PPGIS has been an important tool for the partnership, and partnership members and interns have used various mapping tools and techniques to help express and negotiate values on the landscape. Tulloch (2008: 353) defined PPGIS as a "field within geographic information science that focuses on ways the public uses various forms of geospatial technologies to participate in public processes, such as mapping and decisionmaking." By digitizing uses and values in the form of GIS data layers, PPGIS facilitates land use planning analyses that account for social values (Sherrouse et al. 2011). Here, we focus on the creation of Web-based mapping technologies and use of an ArcGIS online Web map (Forest Partnership 2016) to support the development of a holistic, integrated set of consensus recommendations for the Nantahala-Pisgah forest plan revision. Recommendations were submitted to the Forest Service in fall 2017 (fig. 15.1). The experience of the partnership in creating these recommendations highlights the challenges and opportunities to collaboratively map values on the landscape, as well as challenges particularly relevant to the role of recreation interests in forest planning.

A broad challenge faced by the partnership was variable access and expertise with GIS data. Early in the process, some stakeholders had access to Forest Service and other GIS data and the ability to make their own GIS layers to express and advocate for their interests, while others did not. This variability translated into imbalances of power and expertise that challenged the ability of partnership members to engage with one another and the Forest Service on an equal footing. To mitigate these issues and organize mapping activities, a mapping committee of partnership members and interns was created. The mapping committee was tasked with collecting and managing GIS data, creating GIS layers for partnership members seeking to express their interests spatially, and developing maps tailored for planned conversations. To further address issues of expertise, time was taken in meetings to explore maps and explain the meaning of map layers, including presentations that went into depth on the attributes, metadata, and values represented in map layers.

Although these early efforts succeeded in visualizing many values on the landscape and facilitating partnership conversations, the tools to explore the intersections of interests during and between meetings remained out of reach for many. The creation of an ArcGIS online Web map helped to further democratize mapping, and was supported by hosting GIS data from interested partnership members and the Forest Service. The Web map was managed by a member of the mapping committee with a subscription to the tool. The Web-based application allowed all group members to explore the map between meetings and identify areas of agree-

ment and tension through their own personal and interest-based lenses, making meeting discussions more productive. The Web map also helped the group work through the challenge created by the unwieldy number of map layers representing the broad array of interests in the partnership. Not all interests could be visualized at any one time in static maps created by the mapping team, and yet absences often led to questions of "what about…?" The Web map allowed for these layers to be present and part of the shared understanding of the landscape, even if some layers were not regularly used in any specific meeting or discussion, or were used only briefly.

A key to the collaborative process was the ability to draw on, experiment with, develop, and, when necessary, discard numerous conceptual tools in attempts to redefine contentious areas in ways that lessened or eliminated tensions. Partnership members perceived at various times that the conceptual tools being used by the Forest Service encouraged definitions of places that sustained disagreement. In response, members experimented with defining these areas in new ways, such as a proposed national recreation area or an ecological restoration management area. Although some experiments were discarded, some were critical for finding compromise. For example, the ecological restoration management area created a category (perceived as missing in the Forest Service framework of the time) of broadly supported active management that was responsive to sensitive contexts, such as rare species, old growth, and the values of recreational visitors. A significant part of contention in overlap areas could be resolved through potential recognition of a spatially explicit ecological restoration management area or through precise language in other parts of the forest plan protecting these sensitive contexts.

Lessons: Nantahala-Pisgah Forest Plan

As demonstrated in the Nantahala-Pisgah case study, Web-based mapping platforms like Esri's ArcGIS Online allowed the Nantahala-Pisgah Forest Partnership to create, gather, share, and publish geographic information through Web-based mapping applications that could be explored by the public. In addition to publishing Web maps, mapping was democratized in several ways including (1) managing and hosting data from partnership members and the Forest Service, (2) providing GIS support to partnership members with little or no GIS expertise, (3) scheduling meetings to explore Web maps and explain the meaning of Web map layers, and (4) sharing Web mapping tools with the public through social media. In brief, the case study highlights how a peer-supported collaborative group leveraged GIS expertise and democratized the mapping process to reduce conflict and achieve consensus among wide-ranging interests.

For further perspective, we revisit a public participation study by McKinney and Johnson (2015) that harvested lessons from early-adopter forests of the 2012 planning rule. This initial study included the Nantahala-Pisgah National Forests with a focus on public participation planning. McKinney and Johnson (2015: 4) offered these thoughts on the planning process:

> One overarching lesson learned is that a national forest's approach to public participation should be thoughtfully tailored to the unique conditions and context of that individual forest. Accordingly, any lesson learned highlighted in this report is just that—a lesson learned from experience on one or more forests based on the unique circumstances facing that forest, including its historical use, local norms and culture, and administrative and management capacity.

We build upon the lessons harvested by McKinney and Johnson (2015) in the Nantahala-Pisgah, focusing on the PPGIS approaches referenced in previous sections. PPGIS satisfies dual purposes under the 2012 planning rule by providing opportunities for engagement and relationship building, and by providing social data. These are often treated as separate functions by land management agencies and are rarely synthesized. It is an innovative tool for its ability to meet both these needs and facilitate the use of social science data to influence decisionmaking.

Lessons Learned From Public Participation GIS

- **Map it if you can**. Mapping technologies, including paper maps, interactive online maps, and offline computerized mapping applications, are important tools to express and negotiate values on the landscape.
- **Democratize mapping**. Provide opportunities for the general public to participate in mapping workshops or surveys. Create Web-based maps that can be viewed and shared with the public. Provide access to spatial data that can be downloaded from the Internet, shared, and readily consumed in popular GIS formats.
- **Use high-quality information to express all interests and values**. The use of high-quality information should be encouraged, including non-Forest Service data. High-quality information has been defined by the White House's Office of Management and Budget as information that is "accurate, reliable, and unbiased" and includes the "best scientific information" (OMB 2002). However, differences in data quality should not prevent interests from being expressed through mapping. Stakeholders should ensure that data are collaboratively vetted, understood, and accepted as accurately representing an interest or value.

- **Get everyone on the same page**. When new data are introduced, structure time in meetings to explore maps and explain the meaning of map layers. This can be invaluable to the collaborative mapping process. Including opportunities to discuss the attributes, metadata, and values represented in map layers provides a foundation that can result in more productive discussions, and it can be helpful to reduce conflict among interests.
- **Identify appropriate scales to frame discussions.** Break the landscape into smaller pieces to help frame discussions. Choose geographic areas that represent a meaningful spatial scale between individual management areas and forest boundaries.
- **Find ways to focus conversations without losing nuance**. Landscape-scale mapping with many interests is challenging. Find balance by simplifying the framework for discussion without losing sight of complex values on the landscape.
- **Don't be afraid to experiment and change the terms of the debate**. Experiment with defining forest areas in new ways, such as a proposed national recreation area or an ecological restoration management area. Although some experiments might be discarded, some might be critical for finding compromise.

Compelling Questions

The PPGIS literature suggests several compelling questions to explore and advance our thinking on public participation and decisionmaking.

1. How can crowdsourced data be used to produce high-quality information that informs the planning process? How can crowdsourcing tools be better designed to effectively reach and engage citizens?
2. How does the information from crowdsourcing tools enhance (or complicate) land management planning outputs or lead to environmental and social outcomes?
3. What are the challenges and barriers during the assessment phase of the forest planning process in gathering information from citizens?
4. What are the best methods to collect participatory mapping data from workshops that scope and identify the range of place-based values at stake in the planning process? How might collected data be used for decision support in the planning process?
5. What are the advantages and disadvantages of information collection technologies (crowdsourcing) like PPGIS and planning support systems?

Conclusions

Although national forests support a range of multiple uses and diverse interests, the public overwhelmingly visits and comes to know these forests through their recreation experiences. It is reasonable to assume that recreational visitors traverse nearly every mile of trail and stream, and visit countless trackless acres, in the NFS every year. These visitors, in sum, possess a wealth of knowledge on the condition of forest infrastructure, species presence and absence, recreation opportunities, and other information important to the forest planning process. Public participation inherently taps the collective information and interests that recreation provides, though it is important to note that recreation experiences may inspire a wide variety of interests from wilderness designations to timber harvest. The combination of new planning rules and advances in Web-based mapping technologies are changing how the public can participate in forest planning in a number of ways: (1) interested stakeholders can share spatially explicit public comments with the Forest Service through Web mapping tools, (2) peer-supported collaborative groups can conduct analyses and create their own proposals in conjunction or coordination with the Forest Service, and (3) the Forest Service is increasingly using Web mapping tools to communicate each step in the forest planning process. With these changes comes a learning curve and the ability of interested stakeholders to keep pace with new rules, planning timelines, and new technologies. However, by harvesting lessons from early-adopter forests, these challenges can be overcome, and the Nantahala-Pisgah National Forests case study demonstrates that peer-supported collaborative mapping can be instrumental in developing higher quality forest plans.

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Chapter 16: Outdoor Recreation and Environmental Stewardship: The Sustainable Symbiosis

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> The affective, functional, and cognitive bonds with a place may be important precursors to individuals' choosing to protect or fight for that particular place.
>
> —Elizabeth A. Halpenny

Purpose

This chapter discusses ways in which recreation on public lands can serve as a resource for environmental conservation, highlighting the role of recreationists as stewards of the land and key contributors to sustainable landscapes.

Problem Statement

The presence of recreationists on public lands is sometimes viewed as a threat to ecosystem integrity. Recreation can alter ecosystems, especially if not managed effectively (Larson et al. 2019, Monz et al. 2010). Likewise, inadequately managed recreational use has the potential to detract from the experience of public lands by other users (Manning 2010). However, people interacting with their public lands through outdoor recreation can, and often do, act as stewards for these lands. In many cases, nature-based recreational experiences help to foster connections to place, thereby strengthening environmental values and promoting conservation behaviors (Larson et al. 2018). In this respect, the use of public lands for recreation also adds value to these lands, potentially enhancing environmental health and the human experience of public lands, and contributing to the conservation and appreciation of the ecosystems protected within their boundaries.

Recreational use of public lands adds value to these lands, potentially enhancing environmental health and the conservation and appreciation of ecosystems within their boundaries.

Stewardship can be defined in multiple ways, ranging from high-effort group activities that take place in parks, such as habitat improvement volunteer projects, to low-effort individual tasks that can be completed at home, such as recycling or reducing energy consumption (Larson et al. 2015). Here, we focus on stewardship behaviors that take place in protected area contexts, whether they involve a high

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or low level of effort and are performed in a group or by individuals. In chapter 4 of this report (Armstrong and Derrien 2020), the roles of power and dominion connected to some interpretations of stewardship are discussed. We emphasize the dimensions of stewardship that foster intimate connections between humans and the landscapes they inhabit—connections that are strengthened via outdoor recreation. Finally, we suggest that participation in such actions may carry over to pro-environmental behaviors outside of parks, and emphasize the broader benefits of fostering an interest in environmental stewardship through the recreation context.

There is a demand for participating in the kinds of stewardship activities described above, and satisfaction of that demand generates many diverse benefits. In addition to the ecological benefits that often directly result from stewardship activities, these activities also provide health benefits for the people who engage in them (Wolf and Housley 2017, Wolf et al. 2020). Engagement in various forms of environmental stewardship also create opportunities for a more diverse array of human-nature connections that support human well-being (Blahna et al. 2020a). Developing and maintaining stewardship capacities via recreation is increasingly important considering the state of land management agency budgets and the accumulation of large maintenance backlogs associated with recreational infrastructure on public lands (GAO 2013). Connections between people and public lands through technologies such as social media (Valenzuela 2019) and the potential for engaging stewards through such technology provide unprecedented opportunities for building stewardship capacity. Acknowledging these connections and opportunities, recreation-related stewardship activities are a critical element of the National Strategy for a Sustainable Trail System (NSSTS) (USDA FS 2017). By recognizing the symbiotic relationship between outdoor recreation and environmental stewardship, we can position recreation as a primary product of management that advances both agency goals and human well-being.

Growth in outdoor recreation participation underscores a paradigm shift in recreation management toward a model that positions recreation as a key cog in a sustainable social-ecological system.

Dimensions of the Problem

Outdoor recreation participation has increased in recent decades, and its growth is projected to continue (Outdoor Foundation 2018, White et al. 2016). As stated in the prologue (Cerveny et al. 2019), we encourage this increase in outdoor recreation, appreciate its benefits for the land and its users, and support stewardship as a positive human-nature interaction and as a form of recreation. This growth underscores a paradigm shift in recreation management toward a model that positions recreation as a key cog in a sustainable social-ecological system. Because of its popularity, outdoor recreation contributes substantially to the U.S. economy, making up 2 percent of the 2016 U.S. gross domestic product (USDC BEA 2018). This continued

increase in outdoor recreation participation can be leveraged to benefit ecosystems protected within public lands. Weaver and Lawton (2017) asserted that we need to reframe the current biocentric outlook, which repositions visitors from being seen as inherent threats to protected areas (i.e., "parks with people") to the view that visitors are an opportunity (i.e., "parks and people"). This shift will enable a more effective approach to managing escalating recreation demand in the midst of budget cuts, motivating visitors themselves to participate in activities that support the integrity of public lands, enhancing recreational experiences, and strengthening the relationships between people and these important places (Weaver and Lawton 2017).

Barriers and Challenges

Although some federal agencies have incorporated elements of stewardship into land management, barriers to integration of recreation and stewardship persist. Some of these barriers are due to the orientation of existing planning and management tools, the need to better apply our understanding of recreationist motivations for stewardship activities, and limited agency and partner capacities, focus, and prioritization.

One barrier to engaging recreationists as stewards stems from existing planning and management tools, which perceive recreationists to be a threat to ecosystems and regard natural resource conservation as the top priority (Blahna et al. 2020b). This thinking can be restrictive, however, because recreationists represent a key piece of dynamic social-ecological systems in protected areas (Armstrong and Derrien 2020). As Wolf et al. (2013) noted, a human's ecological footprint can be negative, but it can also be positive. Indeed, the very concept of visitor use and recreation management is shifting to emphasize collaborative planning processes, stakeholder input, and a focus on broader outcomes for both visitors and park resources (Verbos et al. 2017).

Decades of research on visitor experiences, attitudes toward conservation, and motivations for participating in both outdoor recreation and stewardship activities have created a large body of knowledge in each of these respective areas of inquiry, but integration of these concepts is rare. Better application of this interdisciplinary knowledge could build capacity for both stewardship and recreation management. Many initiatives engage recreationists and the general public as volunteers for programs that enhance public land management, but these programs have met differing levels of success and sustainability (Miller et al. 2012). For example, in the case of citizen science, research suggests that collaborative or "bottom-up" efforts to address an issue valued by visitors can be far more sustainable—and fulfilling—than an agency-led approach (Conrad and Hilchey 2011). As our understanding of

both recreation preferences and stewardship motivations grows, this information could be used to facilitate public engagement in conservation activities that is more adaptive, fluid, and malleable.

Although recognition of the sustainable symbiosis of recreation and stewardship may be growing, progress is currently hindered by the limited capacity of public land management agencies to develop, use, and maintain stewardship partnerships to address common goals. The need to increase these collaborative capacities and volunteer engagement in land stewardship programs is widely acknowledged (Cerveny et al. 2020, Selin et al. 2020). These collaborative capacities are also central to the NSSTS, which has identified volunteer stewards as critical to achieving Forest Service objectives related to trail system management (National Forest System Trails Stewardship Act 2016, USDA FS 2017). In some cases, agency practitioners already select partners and cultivate partnerships strategically to accomplish tasks, provide public service, and foster land stewardship (Seekamp and Cerveny 2010). For example, Seekamp et al. (2011) described the many different partnerships the Forest Service has developed to achieve its mission and meet management objectives, including connections with civic groups, youth organizations, guides and outfitters, nongovernmental organizations, and other government agencies. These opportunities could be expanded to explicitly integrate and foster a public stewardship ethic (Seekamp et al. 2011).

Because the recreation experience is shaped by expectations, belief systems, motivations, and prior experiences (Driver 2008, Manfredo et al. 1996, Wagar 1974), understanding the relationship between these concepts and environmental stewardship could promote conservation as a form of recreation (Larson et al. 2018). Planning and management should therefore consider the ways in which the public wants to engage with public lands to encourage long-lasting and fulfilling stewardship programs. To institutionalize these changes, recreation tools and frameworks can be adapted, or new ones developed, to fuse recreation and conservation and explicitly incorporate public stewardship as a method for addressing authentic management challenges. Key elements of stewardship and ideas for further integrating these elements into public land management are presented below.

Environmental stewardship, particularly when viewed as a form of recreation, is a mechanism that can translate the challenge of increasing demand for outdoor recreation into a conservation solution for agencies and programs threatened by dwindling budgets.

New Conceptual Approaches and Opportunities

Environmental stewardship, particularly when viewed as a form of recreation, is a mechanism that can translate the challenge of increasing demand for outdoor recreation into a conservation solution for agencies and programs threatened by dwindling budgets. This subject has received increasing attention recently in environmental management and policy (e.g., Interagency Visitor Use Management

Council, the 1998 National Trail Systems Act, and the NSSTS). Bennett et al. (2018) synthesized the literature on environmental stewardship to define the term, develop a framework to better understand mechanisms behind environmental stewardship, and focus future research in the area. According to this framework (fig. 16.1), three elements are central to environmental stewardship: (1) actors, (2) motivations, and (3) capacity to participate in stewardship activities. Actors can be individuals, groups, or networks of stewards (e.g., recreationists or visitors to public lands). Prior to action, these actors must be intrinsically or extrinsically motivated to steward their resources. Additionally, they must have the ability or capacity to steward resources. Actors' capacities are influenced by local community assets as well as broader governance factors. Public land managers can also foster motivation and build the capacity of recreationist-stewards to effectively engage in environmental stewardship across different contexts.

Stewardship itself is a motivation and a benefit for many visitors to protected areas.

Stewardship itself is a motivation and a benefit for many visitors to protected areas (Bruyere and Rappe 2007). For example, in a study in which local community members near the Deschutes National Forest were asked open-ended questions about the benefits they derived from the national forest, stewardship and volunteer opportunities

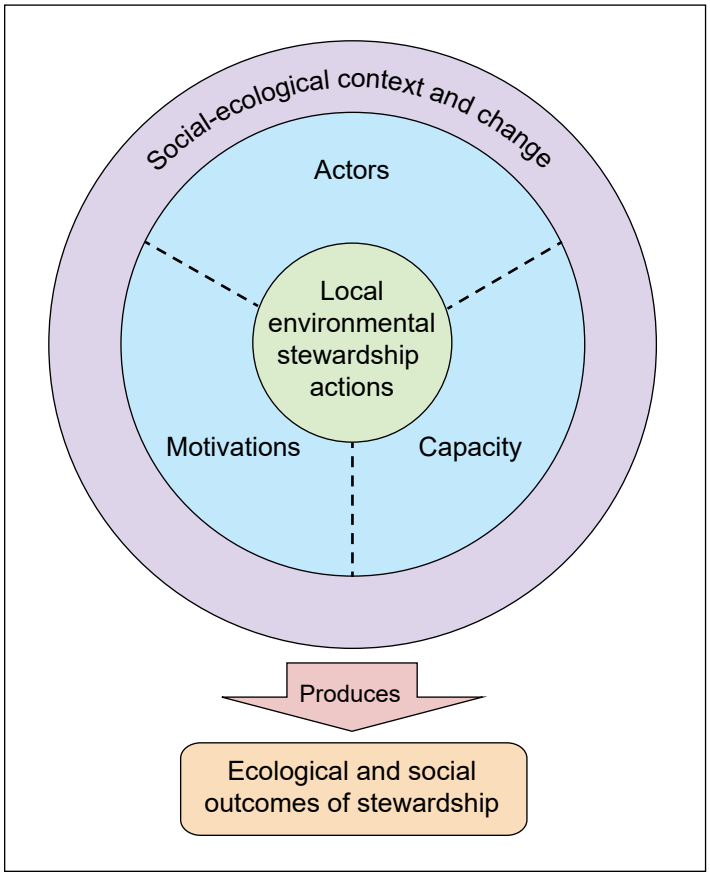

Figure 16.1—A conceptual framework for local environmental stewardship (adapted from Bennett et al. 2018).

emerged as a significant category of benefits (Asah et al. 2014). Other research suggests that both intrinsic (e.g., personal interest and enjoyment) and extrinsic (e.g., group relatedness) factors influence public engagement in ecological monitoring activities (Tiago et al. 2017). In many cases, volunteer or stewardship groups often form around a focal point such as a favorite recreational activity, location, ecosystem, or ecosystem component. An individual's connection to place may play a critical role in this process (Halpenny 2010, Larson et al. 2018). Blahna et al. (2020a: 66) included "participation in shared stewardship and voluntary restoration activities" as one important way that "people interact with and value public lands," an aspect that is not incorporated in the traditional definition of recreation. Moving toward a broader conceptualization of recreation with distinct dimensions related to "human connections" (Blahna et al. 2020a: 66) would include stewardship and volunteer activities, making stewardship a priority for recreation management. But how could that be accomplished?

Linking recreation and conservation behaviors—
Understanding factors that affect recreationists' conservation attitudes and behaviors can help us determine how to better engage visitors as stewards. As several recent studies suggest, recreation itself may informally influence people's conservation ethos and actions. In their study of residents in rural areas in upstate New York, Cooper et al. (2015) found that wildlife recreationists were four to five times more likely than nonrecreationists to participate in conservation behaviors (i.e., donating to support local conservation efforts, enhancing wildlife habitat on public lands, advocating for wildlife recreation, and participating in local environmental groups). Comparing hunters, birdwatchers, and hunter-birdwatchers, researchers found that individuals who identified with both activities (i.e., hunter-birdwatchers) reported the highest likelihood for engaging in conservation behaviors (Cooper et al. 2015). Another study by Teisl and O'Brien (2003) found that outdoor recreation participation was positively correlated with environmental behavior and concern and that impacts varied by activity. Wildlife watchers reported the highest rate of environmental behaviors and a high level of interest in forest management. Zaradic et al. (2009) discovered that certain nature-based activities (e.g., hiking) were linked to financial support for conservation organizations, while Larson et al. (2011) found that past and present outdoor recreation participation were strong predictors of pro-environmental behavior among state park visitors. Collectively, these studies suggest that there may be significant benefits for enhancing conservation protection by encouraging multiple forms of nature-based recreation for long-term conservation gains inside and outside of parks. However, more research is needed to understand mechanisms driving these relationships and the potential for synergistic feedback loops. In many cases, those loops may center on connections to place.

The powerful role of place attachment—
Recreationists' propensity to engage in conservation behaviors may be strongly linked to the attachments they develop to the places where they recreate. Place attachment is a multidimensional construct broadly defined as "the collection of meanings, beliefs, symbols, values, and feelings that individuals or groups associate with a particular locality" (Williams and Stewart 1998: 19). This attachment is derived from place meanings that can be environmental (e.g., scenic beauty, ecological functionality) or social (e.g., community relatedness, belonging) in nature (Ardoin et al. 2012). Outdoor recreation can foster both. A study at Shelburne National Wildlife Refuge in Minnesota found that visitors who were emotionally attached to the place were more likely to engage in civic actions such as donating their time, effort, and resources to the wildlife refuge. Trust partially mediated this relationship, with increased levels of trust corresponding to increased engagement in civic actions (Payton et al. 2005). Positive relationships between place attachment and pro-environmental behaviors like volunteering have been demonstrated in many settings (Gooch 2003, Hinds and Sparks 2008, Walker and Ryan 2008), including protected areas (Halpenny 2010, Ramkissoon et al. 2013, van Riper and Kyle 2014). For example, place attachment was found to be a strong predictor of park visitors' intentions to pick up other visitors' litter within the park (Walker and Chapman 2003). Larson et al.'s (2018) Conservation-Recreation Model, based on a study of wildlife-dependent recreationists, emphasizes the powerful associations between place attachment, community involvement, and stewardship behavior. Monitoring and promoting place attachment, such as by emphasizing the connection between groups and their attachment to and concern for the resource, may lead to increased levels of stewardship among park visitors and the general public (Payton et al. 2005). These actions could, in turn, foster stronger connections to place and additional recreation experiences, nurturing a sustainable symbiosis of recreation and stewardship.

Monitoring and promoting place attachment may lead to increased levels of stewardship among park visitors and the general public, thereby fostering stronger connections to place and nurturing a sustainable symbiosis of recreation and stewardship.

Examples of formal stewardship engagement programs—
Examples of how recreationists engage in public land stewardship in a variety of informal and formal contexts can highlight ways in which public land managers might facilitate these connections. As illustrated above, outdoor recreation is associated with many forms of conservation behavior across public and private spheres. Examples of formal volunteer stewardship programs with more targeted outcomes also abound in parks and protected areas. Focusing stewardship efforts on recreation infrastructure is one way to engage recreationists who have a special interest in a particular recreational activity or setting (Miller et al. 2012). Several activity-oriented groups exist that have national and regional presence to

foster stewardship and assist land managers in maintenance and development of recreational infrastructure related to their particular use (e.g., American Hiking Society, Back Country Horsemen of America, International Mountain Bicycling Association, National Off Highway Vehicle Conservation Council). These groups maintain a general interest in preserving and developing trails and access for their type of use, and promote sustainable trail building through provision of professional services and educational resources on sustainable trail design to land managers and local user communities and advocates.

Other programs emerge that are more site-specific. Many of these efforts are associated with individual trails such as National Historic or Scenic Trails (e.g., Appalachian Trail Conservancy, Continental Divide Trail Association) or specific parks or forests (e.g., Friends of Acadia National Park, Friends of Rothrock State Forest), thereby providing stewardship resources in a variety of contexts. These organizations—often local conservancies or "friends" groups—can form complex networks of volunteers and leverage them to complete significant projects related to infrastructure maintenance and development. The same groups often play key roles in fundraising and fiscal activities that complement public land managers' budgets to address shortfalls that are key to operation, improvement, and conservation.

Recreationists in San Francisco, California, and Portland, Oregon, with a special interest in maintenance of urban-proximate parks can contribute by reporting issues through the ParkScan mobile application or website.

Recreation and stewardship in urban areas—
Stewardship projects are not confined to rural or remote parks and protected areas. In many cases, urban centers present an ideal context for park-based public engagement. Urban-proximate parks have also developed infrastructure-oriented programs to broadly source information from users to inform management and maintenance. For example, recreationists in San Francisco, California, and Portland, Oregon, with a special interest in maintenance of urban-proximate parks can contribute by reporting issues through the ParkScan mobile application or website. ParkScan is used by park and recreation departments in these two cities to efficiently address maintenance issues and geographically analyze the types of problems encountered. Although the San Francisco Recreation and Parks Department is responsible for responding to reports, it also coordinates volunteer workdays and clean-ups (San Francisco Parks Alliance 2012). Similar community-based park monitoring and assessment tools are now being used in other locations as well, highlighting the many ways in which the general public can directly enhance park management (Kaczynski et al. 2012).

The evolving field of civic ecology describes the many ways in which city dwellers engage in recreation-based stewardship practices that promote environmental, community, and individual outcomes (Krasny and Tidball 2012). These activities often include small, self-organized efforts centered on such activities

as community gardening, tree planting and care, and volunteer efforts to restore native habitats. Research is also beginning to highlight factors driving these recreation-based urban stewardship actions and the outcomes they generate (Silva and Krasny 2016). For example, a project conducted in Seattle, Washington, showed that urban conservation stewards were more highly motivated by personal, social, and community functions (all common drivers of outdoor recreation behavior) than by environmental motivations. However, environmental motivations significantly increased in reported commitment to and frequency of participation in urban conservation activities when such activities also aligned with personal, social, and community-building goals. Based on these results, strategies focusing on ecology may be less effective for retaining stewardship participation than those appealing to visitors' personal and social motivations for conservation (Asah and Blahna 2012, 2013). In other words, it might be prudent to promote stewardship itself as a recreation activity (Blahna et al. 2020a). However, there is still some uncertainty about the outcomes such activities generate for urban parks themselves and the quality and health of the ecosystems within these parks (Fors et al. 2015).

Despite growing interest in these urban initiatives, resources are limited. Most environmental stewardship projects in cities operate with minimal staff and meager budgets that are rarely backed by municipal funding (Svendsen and Campbell 2008). They rely heavily on fragmented populations of dedicated volunteers, which limits their capacity to develop and expand. Collaborative partnerships that promote agency and autonomy within communities and across different sectors are key to the long-term success and sustainability of any stewardship program, particularly those that rely on volunteers (Barnes and Sharpe 2009). Citizen science projects, for example, highlight the potential for recreation activities to contribute to larger conservation goals (McKinley et al. 2017). Urban parks provide a place where such partnerships can evolve and mature, with outdoor recreation as the catalyst.

Gamification of stewardship in outdoor settings—
Increased use of technology such as social media and smartphones by recreationists (Valenzuela 2020) can facilitate the gamification of stewardship on public lands. For example, Volunteers for Outdoor Colorado has created a mobile phone application that encourages people to participate in acts of stewardship ranging from picking up trash to trail building. This app provides a gamified means of motivation, allowing users to earn badges that can be shared on social media. Stewardship is sometimes thought of as a large commitment, such as spending a weekend day trail building with a group. This idea highlights the importance of "smaller" acts of stewardship that can be completed individually, both within public lands (e.g., picking up

trash) and at home (e.g., turning off lights) (Volunteers for Outdoor Colorado 2018). Recent enthusiasm for Pokémon Go in parks demonstrates the potentially influential role that technology can play in fostering positive relationships between recreation activities and conservation attitudes and behaviors (Dorward et al. 2017). This phenomenon suggests lessons that the parks and conservation world could learn by including a user-friendly experience requiring only commonly owned equipment, no start-up costs, and no specific location, as well as an anthropomorphized story line to appeal to a wider public. As more studies reveal the potential benefits of gamifying nature and conservation through digital technology (Arts et al. 2015, Sandbrook et al. 2015), park and protected-area managers seeking to advance stewardship goals via recreational pursuits would be wise to respond to this trend.

Compelling Questions

1. What are the key obstacles to effective stewardship of outdoor recreation settings and related infrastructure? How can agencies and stewards efficiently develop capacities (including partnerships) to address these obstacles?
2. Why is recreation viewed as a threat in some contexts but as a stewardship opportunity in others? For what types of problems and issues are recreationist-stewards an efficient, effective, and desirable solution?
3. What are key factors mediating the relationship between outdoor recreation and conservation behavior, and how can this link be strengthened?
4. What elements help transform recreation into stewardship, and vice versa? Elements may be tangible (e.g., formal programs and management infrastructure) or intangible (e.g., cognitive factors and motivations).
5. How do agencies shift priorities to place strong emphasis on development and engagement of volunteer stewardship partners? What data and structures are required to integrate stewardship at the local, regional, and national levels?
6. How can existing outdoor recreation planning and management frameworks or models be modified to explicitly integrate stewardship and encourage public engagement in conservation?
7. How might current and future trends in outdoor recreation (e.g., shifts in demographics of visitors, new and emerging recreational activities, rise of technology) be used to emphasize recreation as stewardship, perhaps even before detrimental impacts arise?
8. How might the concept of recreation as stewardship be leveraged to support urban park planning and management in an environmentally and socially just fashion?

Conclusions

Based on recent research on the connections between outdoor recreation and stewardship, we suggest that public land managers view recreationists as stewards of, rather than as threats to, the lands they manage. Such a realignment follows Weaver and Lawton's (2017) call for a paradigm shift from "parks with people" (creating impacts) to "parks and people" (operating in harmony). Following the environmental stewardship framework proposed by Bennett et al. (2018), we encourage a focus on actors, motivations, and capacities to develop sustainable stewardship opportunities—both informal and formal—linked to outdoor recreation contexts. A growing body of research is improving our understanding of people's motivations to initiate and remain involved in stewardship activities. How do we build the capacities of recreationists to carry out these stewardship actions while simultaneously developing land managers' capacity to leverage these actions to support management goals?

To institutionalize the shift toward viewing recreationists as stewards of the land and to improve the sustainability of recreation-based stewardship programs, we benefit from continued examination of conservation-recreation-stewardship linkages.

To institutionalize this shift and improve the sustainability of recreation-based stewardship programs, we benefit from continued examination of conservation-recreation-stewardship linkages. Further exploration of the public's demand for integrating recreation and stewardship into planning and management frameworks also may be warranted. Informally, this could be accomplished by creating positive place-based recreation experiences for diverse audiences (Sanchez et al. 2020). Formally, it could be done through the creation of volunteer programs and initiatives, the development and support of local conservancies and friends groups, and enhanced partnerships with other stakeholders who foster collaboration and public engagement (Cerveny et al. 2020, Selin et al. 2020) to address authentic ecological and social management challenges. Through better understanding of recreationists, we can find new ways to appeal to visitors and make stewardship-related activities an integral part of the recreation experience. In doing so, we can help cultivate a symbiotic relationship between parks and people. It is important to consider whether this symbiosis, and associated opportunities for both outdoor recreation and stewardship, are equitably distributed across all communities and park settings (Holifield and Williams 2014). Ultimately, the explicit incorporation of stewardship into outdoor recreation planning and management frameworks could help land management agencies and organizations proactively and efficiently produce quality outdoor recreation experiences and positive conservation outcomes.

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Chapter 17: Using Social Media for Research and Monitoring the Changing Landscape of Public Land Use

Sonya Sachdeva[1]

> And the choice we face…isn't whether or not that is the [social] media environment we want to operate in. That's the media environment we've got. The question we all face now is, 'How can we make best use of this media? Even though it means changing the way we've always done it.'
>
> —Clay Shirky, TED talk

Purpose

In chapter 7 of this report, Francisco Valenzuela discussed how digital technology is changing the character of recreational experiences on public lands. Chapter 17 highlights the potential and pitfalls of using social media in research and monitoring on public lands. Recent research has revealed that social media can be a powerful tool in quantifying visitor use and utility on public lands. It can also provide managers with rich qualitative information about visitor experiences, satisfaction, and engagement that can be leveraged to achieve a more enjoyable recreation experience while creating more resilient ecosystems. In this chapter, we also highlight some challenges that the use of social media data entails, such as the need to validate models relying on "noisy" data. Managers may also need to become better versed with a wide variety of social media technology, as well as to understand how social media use varies with visitor goals and backgrounds. We end with a reflection on how this technology is transforming the management of public lands and enhancing the relationship between people and the outdoors.

Problem Statement

The rapid pace of technological innovation has affected virtually every facet of 21st-century society. The management of our public lands and shared natural resources is no exception. Although these technologies have been adopted more gradually within public lands management, it seems clear that innovations such as mobile applications on smart devices, autonomous vehicles, and social media are fundamentally affecting how we make decisions about our public lands. The latter, in particular, is most relevant to the study and practice of outdoor recreation, as social media appears to be changing human interactions as well as ways that people relate

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to and engage with the natural world (Büscher 2016). This bidirectional flow of information implies that social media can be used not only to inform management decisions but also by public land managers to inform and guide visitor behavior. Informal observations suggest that record-high rates of visitation to national parks can be attributed, in part, to the desire of visitors to post images of themselves framed by scenic vistas (Egan and Egan 2016). This has clear implications for public land managers. Although record attendance boosts revenues to some public lands, it can also create traffic congestion, ecological disturbance, and safety issues, and can otherwise overwhelm available resources and diminish visitor experiences. However, the proliferation of social media use and users on public lands can also be a valuable resource for adaptive land management, providing much-needed insight into such factors as visitor demand, characteristics, and motivations.

One of the most common ways in which social media data can be used to inform outdoor recreation policies is by measuring visitation rates and assessing overall user counts. These measures are of paramount importance to managers as they help aid decisions as to where resources should be allocated to improve visitor experiences, and where interventions are most critical to sustaining landscapes. Traditionally, user counts are collected either by installing physical counters (infrared or pressure) or by conducting visitor surveys at trailheads, both of which may entail substantial cost (Cessford and Muhar 2003, Ryus et al. 2014). Automated traffic counters must be installed correctly and be regularly maintained, and, depending on the type of counter used, may not be effective at distinguishing between type or modality of use (e.g., bicyclist versus pedestrian versus a group of pedestrians) (Lindsey et al. 2014). Manual counts may provide more precision but fewer data points without an extensive group of dedicated data collectors (Fisher et al. 2018). Other measures have been developed to address issues of the breadth of data. For instance, the Forest Service's National Visitor Use Monitoring (NVUM) program provides forestwide estimates, as well as descriptive information about what activities forest visitors are most likely to engage in, activity duration, visitor demographics, and overall satisfaction (English et al. 2002). These data, while providing an extensive snapshot of public use of the national forests, comes at the expense of specificity of information that might be useful to managers of a specific forest. For instance, which trails or campsites might entail specific management problems, or when are gridlocks more likely to occur at a specific location within a specific forest?

Social media data can operate at both national and local scales. The vast amounts of geolocated data generated by posts on Twitter, Flickr, and Instagram[2]

[2] The use of trade or firm names in this publication is for reader information and does not imply endorsement by the U.S. Department of Agriculture of any product or service.

can effectively and accurately provide a broad, national-level perspective on visitor demand and estimates of overall use of public lands (Wood et al. 2013). But these data can also provide information at a more local fine-grained temporal and geographic scale. Unlike NVUM, which samples each forest within the National Forest System once in 5 years, social media data can be collected continuously over time and across the entire system concurrently (Fisher et al. 2018). Clusters of activity at particular spots can help identify trail systems, watersheds, and landscapes where management problems are currently present or can arise (Sonter et al. 2016) (fig. 17.1). In addition to providing simple use estimates, social media posts can also be used to infer descriptive information about how

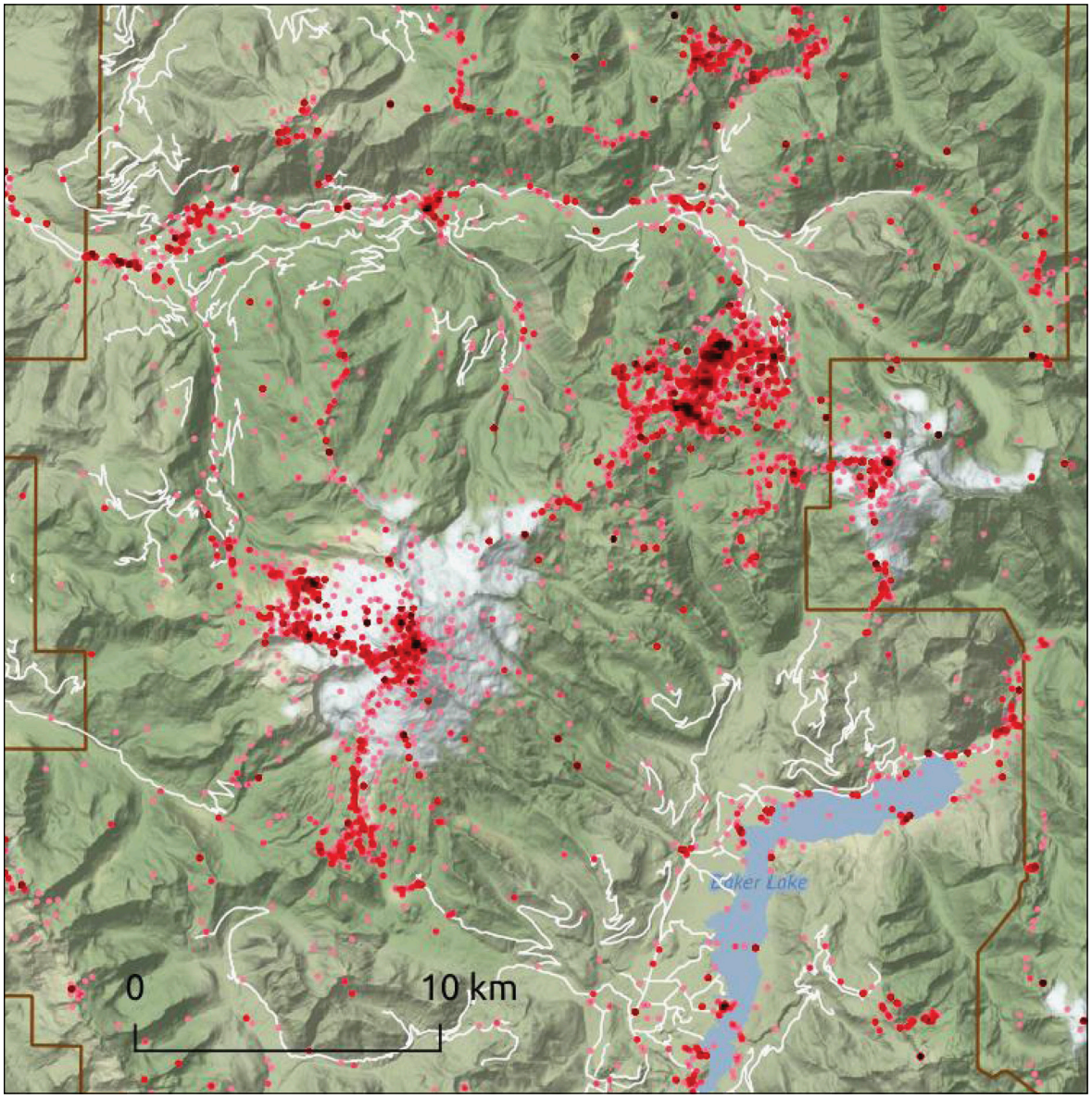

Figure 17.1—Photo postings to Flickr® of the Mount Baker area on the Mount Baker–Snoqualmie National Forest, Washington.

visitors are using the land by delving deeper into the text and images that accompany users' posts. Image classification, for example, can show whether bicycling is more popular than jogging among social media users on a particular trail, or what scenes are more likely to draw in visitors (Somasundaram et al. 2009). Semantic content analysis of the text can reveal user demographics, interests, and even the experiences that people are having and sharing at particular sites (Schertz et al. 2018).

Social media data may also be more suited than traditional counting methods to address participation and equity issues in the use of public lands. A large body of research has previously documented that racial and ethnic minorities tend to visit national parks and forests at a lower rate than other groups (Johnson 1998, Scott and Lee 2018) even as the national population has become more diverse (Colby and Ortman 2014). Social media platforms, and the social networks formed within them, may help reach visitor groups that may not be learning about public lands and outdoor recreation through other forms of media (Aydın and Arslan 2016, Flores and Kuhn 2018), as racial disparities in social media use tend to be less profound than in other forms of media (Hargittai 2007, Hargittai and Jennrich 2016, Jackson et al. 2008). Younger people are also less likely to engage in outdoor recreation overall. But, just as young people are often more comfortable with technology than their older counterparts, social media data can be helpful in facilitating communication with previously unreached or underserved visitor groups. These data can also give managers insight into which facilities and public spaces are being underutilized by younger visitors or minority groups (Hamstead et al. 2018).

Social media has the potential to be a transformative tool to measure use of public lands across a broad spectrum of visitors with different motivations and goals, as well as a means of fostering rich relationships between people and their environments.

Managers' understanding of why people visit public lands and why they engage in nature-based outdoor recreation has shifted dramatically in recent decades. As noted by McCool et al. (2020) and Blahna et al. (2020), the paradigm has shifted—from a belief that visitors come to our national parks and forests to seek solitude and a "wilderness experience" to the understanding that motivations to recreate are as diverse as our populace (Winter et al. 2004). Public land managers' communication and messaging appears not to have co-evolved with this shift in paradigm. As noted in a recent report, many of the National Park Service's external communications and publicity materials perpetuate an individualistic ideal of spending time in nature (Wells 2018). Not only is this ideal not reflective of broader public sentiment and trends, but it may also be untenable in some areas with increased rates of visitation. Social media has the potential to be a transformative tool to measure use of public lands across a broad spectrum of visitors with different motivations and goals, as well as a means of fostering rich relationships between people and their environments.

Barriers and Challenges

Before this potential can be fully realized, researchers have a responsibility to clearly outline the possible drawbacks and limitations of social media in visitor use monitoring and recognize the continuously evolving nature of how social media is being used by visitors to public lands. Anyone with even the most basic experience with social media from either a consumer or modeling standpoint can most likely attest to the noisiness of social media data (i.e., unusable or irrelevant data). Posts vary in quality of content, often needing to be extensively edited to provide usable data, and user location information is not always reliable or even available. For instance, in many remote locations, cellular signals may be weak or absent and users may not be able to post content that could be particularly helpful to outdoor recreation managers.

Furthermore, owing to increased regulatory scrutiny and (justifiably) increasing privacy concerns on the part of users, social media data of all types may become more challenging for researchers to access (Beninger et al. 2014, Boyd and Crawford 2012). In recent months, Facebook, Instagram, and Twitter have all restricted the means and quantity of data they provide—not only to private companies but also to researchers. Third-party resellers of social media data are virtually extinct, so researchers and managers who wish to use this sort of data might have to capture it through increasingly limited APIs (application programming interfaces) offered by the social media platforms themselves, or form partnerships with social media analytic companies. Although these efforts most likely will be more cost-effective than other data collection means (i.e., trail counters, field intercept surveys), depending on the approach used, access to social media data could cost several thousand dollars per request.

Thus, researchers, while building estimates of use for various trails or inferring visitor motivations to recreate outdoors, face at least two distinct conceptual barriers to overcome. First, they must be attentive to signal-to-noise ratios within social media data and be able to independently ground-truth their model estimates (Wood et al. 2013). Social media data can be plentiful but can also contain a substantial amount of spurious information. Second, researchers (and managers) should proactively address the potential ethical issues arising from using secondary data, such as those collected from private social media companies. Social media companies are increasingly restricting access to their users' data, and researchers should also ensure that user privacy is protected and that data are maintained securely (Moreno et al. 2013).

Managers, too, must view these data not as substitutes for traditional use estimation methodologies but rather as complementary tools for observing visitation in realtime, attaining descriptive information through fairly low-cost means, and

improving communication with customers and visitors. This requires an increased level of technological prowess on the part of many land managers, for whom this may be a new mode of communication, to enable them to monitor social media feeds across platforms. Note that this does not imply that managers need to be adept at programmatically collecting and analyzing social media content. Rather, it could be as basic as managers becoming more fluent in the tasks of ensuring that social media sites belonging to their organization, forest, or park provide current and up-to-date information. They may also need to adjust how they communicate necessary information; analyses of social media content have shown that the types of information people seek differ by social media platform. For instance, visitors often use Twitter and Instagram for weather and closure-related information (i.e., information that changes more rapidly), whereas they might use Facebook and Google for more stable information such as park hours (Garrison and Li 2014). Being well-versed across a diverse array of social media platforms will allow managers to more effectively communicate with visitors.

Finally, as noted above, social media data can potentially be used to bridge historical and current inequities in the use of public spaces. But it is important to be mindful that these tools are not used in a way that serves to reinforce those same disparities. Although overall social media use does not vary as a function of race, different groups may differ in how they use social media and in which media outlets they most prefer (Hargittai 2007). Outreach and community engagement are still critical, even as more communication occurs online. Bolstering these traditional outlets will also help managers better understand customers' needs and, as negative feedback arises, address those concerns more productively (Schenck 2018).

New Conceptual Directions

Insights from visitors' social media conversations can provide close to real-time management feedback.

The wide availability of social media data has led to a transformation in how social scientists think about data and, as this chapter has argued, created new opportunities for more effective land and natural resource management. Insights from visitors' social media conversations can provide close to real-time management feedback—revealing when bottlenecks are most likely to occur, where visitors feel most versus least satisfied, what provisions are lacking on certain trails, what interpretive and informational messages visitors are accessing, and, from an ecological standpoint, whether certain natural systems are more likely to be disturbed than others. Although headway has been made toward answering these questions, researchers can create models that better integrate visitor flow/use estimates with descriptive and experiential information, and also incorporate ecological and landscape characteristics (Beeco and Brown 2013). Managers have long been aware of the need for balance in manag-

ing for recreation and natural resources (Lynn and Brown 2003), and the analysis of social media may provide them with another powerful tool to do so effectively.

Recent evidence also suggests that social media use may increasingly present a safety concern on public lands. Visitors to national parks and forests may be engaging in riskier behaviors in recent years, resulting in part from their desire to create popular social media posts. Although the evidence, at this point, is primarily observational and anecdotal, land managers have seen an increase in social-media-related accidents (Bain 2018, Tory 2018). The danger is twofold: not only do social media users engage in risky behavior to create noteworthy posts, but secondary viewers of these posts may then underestimate the risk involved when they emulate these behaviors (Isaak 2016). The preponderance of information available online may also lead some novice visitors to believe that certain trails and climbing routes are more accessible and easier to navigate than they really are. These safety concerns may be successfully addressed by further research on social media trends. For instance, by measuring trends in online conversations or posted images with geotagged locations, researchers might be able to predict which sites may become visitor hotspots and consequently at increased risk for accidents. Managers can then proactively intervene in these areas to prevent visitors from engaging in risky behaviors.

Despite the Internet content that can best be described as unproductive or downright frivolous, it is difficult to deny that social media is providing many people with a new platform to engage with civic issues (Waters and Feneley 2013). Many conservation and environmental organizations already offer specialized applications that raise awareness, disseminate information, and solicit donations (Büscher 2016, Nah and Saxton 2013). Most public land management agencies also have social media accounts that they use to communicate with visitors, creating a much more interactive visitor experience (Keane 2016). However, this also presents an opportunity to transform visitors from tourists to active stewards of our public lands (Francis et al. 2017). Land managers can enlist visitors to actively seek and report sites that require cleanup (see, for example, this Forest Service story map at https://usfs.maps.arcgis.com/apps/StoryMapCrowdsource/index.html?appid=71260d441cfc4305851c739d148fc23d) and perhaps even tap into influencer networks on social media to draw visitors for that explicit purpose. These initiatives to promote ecological behaviors and awareness of social-ecological systems may become even more effective if they move beyond the typical social media sources (e.g., Facebook, Twitter, and Instagram) and take advantage of more specialized social networks. These may include Strava, a popular social network for athletes that displays running and biking routes, or the Washington Trails Association, which allows hikers to post reviews and advice about trails across the state.

Compelling Questions

As a new tool in the arsenal of natural resource managers and environmental scientists alike, the analysis of social media data allows us to pose and answer several compelling research questions:

9. Can social media provide accurate and usable estimates of visitor flow that are more fine grained and spatially explicit than traditional use estimation methodologies? Who is using social media? Who is missing from this data set? How do we integrate social media data with traditional data?
10. Can these new tools also provide rich descriptive data about visitor experience and engagement?
11. Can these estimates function at various temporal and geographic time scales?
12. Can social media data provide real-time management feedback that is actionable? For instance, can users alert managers to safety issues, points of natural disturbances, and traffic gridlock?
13. Can social media allow for a more interactive experience between managers and visitors?
14. How can these platforms be used to tailor visitor experience and address the diverse motivations underlying outdoor recreation, as well as the socioeconomic, racial, and age-based diversity of visitor groups?
15. Can social media be used to engage the public in land management issues and provide a pathway to inspire a new generation of environmental stewards?

Conclusions

As with any new tool or technological innovation, the use of social media data requires a balance. Managers and scientists can understand what type of insights these data can provide from a visitor experience and natural resource management perspective while overly relying on this data source at the expense of traditional monitoring methodologies. It seems clear, on the basis of current and ongoing research, that social media data can be effectively used to understand how many visitors are using public lands, in which ways, and to what end. As yet unknown, but remaining as a tantalizing possibility, is whether these newly emerging tools can help develop a cohort of environmentally knowledgeable and engaged visitors who recreate conscientiously and share stewardship responsibilities with public land managers.

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