Entrenched ties between outdoor recreation and conservation pose challenges for sustainable land management

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Abstract

Public demand for outdoor recreation has proved a major impetus for land protection in the United States since the mid-twentieth century, particularly in the US West. Many federal, state, and municipal conservation tools—policies, management programs, and funding initiatives—aim to ensure recreation access to public lands in conjunction with natural resources protection. However, as recreation use increases, driven by amenity migration and economic development, land managers face a growing challenge in balancing the trade-offs between recreation access and other conservation objectives. Drawing on original archival research, we describe the strong policy ties between outdoor recreation and conservation that emerged in the post-World War II era in response to widespread urbanization. Through semi-structured interviews with land managers, we assess the implications of those policy decisions for today’s public land managers. Current management challenges include: poor visitor awareness of the cumulative impacts of recreation activity, resistance by local communities and user groups to restrictions on recreation access, insufficient scientific data to guide management decisions, and limited resources to manage recreationists and enforce regulations. We conclude by proposing strategies to promote sustainable management of multiple-use landscapes through targeted research, application of conservation planning principles, and enhanced cooperation among jurisdictions.

Introduction

Public demand for outdoor recreation is a major driver for land protection in the United States, where the desire to ensure sufficient public lands and open spaces for nature-based recreation activities has shaped public policies, management programs, and funding initiatives for decades. Thanks, in part, to these efforts, which emerged following World War II and in response to concerns about rapid urbanization, recreation is now a widespread and growing use of public lands. In North America, public access is permitted on 95% of protected lands (Dudley 2008) and participation in nature-based recreation is on the rise. Between 1982 and 2009, for instance, the number of Americans who reported that they went bird watching quadrupled (404%), and the number who went day hiking more than tripled (328%) (Cordell 2012; figure 1). Others part of the globe, notably Europe, Africa, Asia, and Latin America are experiencing higher growth rates in visitation than the US (Balmford et al 2009).

Given that the United States, along with other countries, looks to public lands and other protected areas as the primary strategy to protect biological diversity (Rodrigues et al 2004, Gaston et al 2008, Loucks et al 2008, Jenkins and Joppa 2009), the conservation success of public lands depends on recreation being managed in a way that is compatible with conservation goals. Of concern, then, is a growing body of scientific literature demonstrating the negative ecological impacts of outdoor recreation and nature-based tourism (Monz et al 2013, Sato et al 2013, Steven and Castley 2013, Hammit et al 2015, Larson
et al 2016). Outdoor recreation constitutes the second-leading cause of species endangerment on public lands in the United States (Losos et al 1995), and recent studies have linked recreation activity to declines in wildlife abundance or activity levels (Reed and Merenlender 2008), changes in spatial or temporal habitat use (George and Crooks 2006), increased physiological stress (Arlettaz et al 2007), reduced reproductive success (Finney et al 2005), altered behavior (Geoffroy et al 2015), and changes in species richness and community composition (Kangas et al 2010).

These studies raise important questions about managing the trade-offs between conservation and recreation goals in the US: How did recreation and conservation arise as dual goals for many public lands in the US? What challenges do potential conflicts between recreation and conservation pose for public land managers, who often are charged with multi-use management, including permitting public access and protecting natural resources? What interventions can land managers make to mitigate the potential conflicts between conservation goals and rapidly growing recreation use?

These questions are particularly acute and relevant in the US West. The region is home to the majority of federal public lands; 11 western contiguous states hold over 73% of US Forest Service lands, and over 70% of Bureau of Land Management lands (Vincent et al 2017). In addition to its high rate of outdoor participation (Outdoor Foundation 2018), the region also offers easy access to public open space and outdoor recreation opportunities that have proved a serious draw to businesses and have helped to anchor the amenity migration to the West (Headwaters Economics 2012, Philpott 2014). The potential conflicts between natural resources management and recreation in the US West are only likely to intensify at a time when natural resources, particularly wildlife, must respond to both heightened recreation impacts and climate change.

We draw on original historical archival research and content analysis of 29 semi-structured interviews to address these questions. In doing so, we aim to foster a broader, more nuanced conversation about the role of recreation on public lands in the US West—one that acknowledges the real trade-offs between recreation and conservation, and the pressing challenges managers currently face in managing the trade-offs. We also propose strategies for land managers, based on those identified in the global literature, to mitigate the potential impacts of outdoor recreation on biological diversity.

Methods

This study utilized two research methods. First, we conducted original historical archival research to document the long-standing ties between outdoor recreation and public land management. We completed content analysis of pertinent archival materials, including minutes and documents from the Outdoor Recreation Resources Review Commission (ORRRC), archival notes surrounding debates on the creation of the Land and Water Conservation Fund, and archived papers of key conservationists involved in ORRRC and the creation of the Land and Water Conservation Fund.

Second, we conducted twenty-five semi-structured interviews with land managers and four with outdoor user group organizations. We identified fifty land managers with direct land management experience, first through internet searches, phone inquiries, and recommendations from land management agencies and then through snowball sampling. These potential participants were selected to include a cross-section of representatives based on: (1) different public agencies, including land managers from the US Forest Service, the National Park Service, Bureau of Land Management, state parks, and municipal open spaces; (2) different proximity to major population centers, including those close to major cities (e.g. Denver) and those in more remote settings (e.g. Alaska); (3) experience with lands boasting different natural amenities.  

Figure 1. Recent increases in the number of adults (16 years and older) participating annually in motorized and non-motorized outdoor recreation activities in the US (Cordell 2012).
(e.g. rivers, lakes, mountains); and (4) different management area sizes. We sent IRB approved email requests to land managers. Twenty-four land managers responded and were interviewed for the study. In addition, we identified ten policy directors from major outdoor recreation user groups and sent an IRB approved email request. Four representatives responded and were interviewed. Given the response rate from major user group populations, the analysis draws entirely on data from land manager interviews.

The semi-structured interviews entailed fourteen structured interview questions, plus follow-up questions, designed to evaluate interviewees’ experience with outdoor recreation management, the trade-offs, if any, they view between conservation and outdoor recreation, the broader challenges they face in managing protected areas, and their notions of best management practices pertaining to outdoor recreation (see appendix). We then conducted a qualitative content analysis to reach conclusions about the patterns and themes that emerged from the interviews: (1) conflicts and trade-offs between outdoor recreation and other conservation uses, if any; and (2) challenges protecting managed areas.

This study was not designed to provide a statistically significant sample, but to present a robust cross-section of land managers. Given the overlap in challenges and trade-offs experienced by land managers across a spectrum of protected areas, we believe this initial data suggest notable challenges and merit further studies with larger samples.

Outdoor recreation: a major driver for public land protection in the United States

Outdoor recreation became a major impetus for land protection following World War II, prior to the mainstream environmental movement, and at a time when urbanization and commercial resource extraction were considered the major threats to open space and protected lands. Certainly, promoting Americans’ enjoyment of nature did influence land protection prior to the 1950s in national and state parks: scenic preservation served as one motivation to establish America’s early national and state parks, just as public health goals prompted the creation of city parks (Schuyler 1986, Runte 2010, Cox 2011). In the early twentieth century, Americans’ desire to enjoy the outdoors also bolstered support for the National Park Service and launched growing support for wilderness areas (Sutter 2002). Yet, the political influence of outdoor recreation remained largely limited to national and state parks (Hays 1987).

Following World War II, though, outdoor recreation became the major motivation for new open space acquisitions and a primary management objective. Widespread concerns about the country’s rapid post-war urbanization and diminishing open spaces available for outdoor recreation proved an impetus for new land protections at state and local levels (Hays 1987, Walker 2007, Thomas 2009), just as debates about commercial extraction influenced new land designations and management plans on federal public lands. These efforts gained strong support from a public that was participating in outdoor recreation activities at record levels (Clawson and Knetsch 1966). The widespread cultural belief in the importance of outdoor recreation as an antidote to urbanization and industrialization added political weight to efforts to preserve recreation opportunities (Udall 1963, Nash 2001, Thomas 2009).

Combined, these factors catalyzed a new focus on land protection at the federal, state, and local levels, with the US West being a particular beneficiary of the efforts given its preponderance of federal public lands. The influential ORRRC helped cement the close ties between outdoor recreation and public land protection, leading directly to Congress’ passage of the Wild and Scenic Rivers Act (1968) and the National Trails Act (1968) (Thomas 2009). It provided critical political support for the passage of the Wilderness Act (1964), and it resulted in the Land and Water Conservation Fund (1964), which appropriates funding for land planning, acquisition, and development for outdoor recreation (Thomas 2009). Combined, these efforts help preserve large and iconic landscapes across the West (Thomas 2009). At the municipal level, outdoor recreation proved a major rationale for efforts to protect local open spaces (Hays 1987).

As outdoor recreation emerged as a major impetus for land protection, few mid-twentieth century decision-makers and conservationists questioned its compatibility with other conservation goals, including biodiversity protection. In fact, advocates sought to elevate recreation as a public land use (Thomas 2009) to counter the threats of urbanization and resource extraction and, as one conservationist explained, ‘hold up our end of things against … commercial interests in the West’ (Thomas 2009).

The legacy of mid-twentieth century public land protection strategies

Outdoor recreation continues to constitute an important justification for land protection today, and many of the policy and management tools developed in the mid-twentieth century to ensure outdoor recreation opportunities remain central to public land protection decisions in the US West and nationally. At the federal level, public agencies continue to make additional protections to existing public lands through the establishment of wilderness areas, the creation of wild and scenic rivers, among other designations, and the promotion of outdoor recreation as a multiple use. At the local level, municipal open space entities are mandated to achieve a variety of conservation goals, from watershed protection to agricultural preservation (Nolon 2003). But a primary goal for many
municipal open spaces is providing outdoor recreation experiences to local communities. In this respect, US access is comparable with global trends: 91% of protected areas in Asia permit access, 89% in Australia, 93% in Europe, and 94% in South America permit access, 89% in Australia, access is comparable with global trends: 91% of experiences to local communities. In this respect, US municipal open spaces is providing outdoor recreation set aside for watershed protection, nearly all outdoor recreation, and the purpose of municipal of the Land and Water Conservation Fund, a major spread recreational access in the US is the multiple-use municipal-owned open spaces are available for out-door recreation

Outdoor recreation also remains a critical source of political and financial support for land protection at the state and local levels. Since 1965, significant funding for new land and water protections has come from the Land and Water Conservation Fund. The Fund averages $100 million in grants per year, and since its inception, the LWCF has directed over $3.6 billion dollars for land and water protection and has led to the acquisition of 2.6 million acres at the state and local levels (National Park Service 2008). The public also has directed funds toward acquiring and maintaining open space for recreation. Since 1988, Americans have passed 1830 measures totaling nearly $60 billion for open space protection that includes recreation goals (Trust for Public Land 2014). Finally, conservation groups continue to advocate for and justify land protection on the basis of the outdoor recreation opportunities it provides. Indeed, outdoor recreationists are widely believed to be important constituents of the conservation movement (Pergams and Zaradic 2008), though empirical evidence supporting this assumption remains mixed (Glowinski and Moore 2014).

**Land management challenges**

As recreation continues to grow as a major use of public lands, land managers in the US West, and across the country, face a host of challenges in ensuring public access and achieving conservation goals, including biodiversity protection. In order to identify the primary management challenges posed by outdoor recreation, we conducted 29 semi-structured interviews with US federal, state, and municipal land managers and outdoor industry advocates (appendix). In response to open-ended questions, land managers cited four main challenges.

First, limited public awareness about outdoor recreation’s impacts impedes effective management. When asked if the public perceives a conflict between outdoor recreation and conservation, 83% of land managers said no. As one land manager explained, ‘People do not see the impacts, either due to ignorance or a lack of baseline information’ (Personal communication 2013). Without public awareness of the problem, effective management proves difficult. One manager explained, ‘Even though we have regulations, people don’t understand why they are in place so they ignore them’ (Personal communication 2012). A couple of factors may contribute to this inattention. For one, recreation’s impacts often have limited visibility; logging and mining leave clear marks on the landscape, whereas the effects of quiet recreation are less noticeable, especially to the untrained eye (Manning et al 2004). This challenge is compounded by the issue of scale: the cumulative effects of recreationist’s actions are not readily apparent to the individual (Personal communication 2013).

Second, land managers note the public resistance they often face when limiting recreation for conservation purposes. Indeed, 67% of land managers interviewed mentioned public interest and scrutiny to recreational management decisions as a challenge they face in managing recreation. ‘We often wait until we absolutely have to’ to restrict access to a place ‘because constituents will spend considerable time in appealing the decision’ (Personal communication 2013).

Third, land managers often lack the ecological data necessary to make informed management decisions about recreation and conservation. Over 58% of land managers interviewed maintained that there was

**Table 1.** Total area (km²) and percentage (%) of public and private protected areas that permit public access for recreation in the United States.

| Recreation access | Federal | State | Local/Regional | Private | Total |
|-------------------|---------|-------|---------------|---------|-------|
| Open access¹      | 1639 594 (58.7) | 305 469 (40.2) | 12 288 (46.8) | 11 216 (5.9) | 1968 567 (52.3) |
| Restricted access² | 875 280 (31.3) | 112 821 (14.8) | 12 165 (46.3) | 1544 (1.9) | 1001 810 (26.6) |
| Closed³           | 169 940 (6.1)   | 8917 (1.2)     | 754 (2.9)     | 104 572 (55.0) | 284 183 (7.5) |
| Unknown           | 107 653 (3.9)   | 332 515 (43.8) | 1053 (4.0)    | 70 829 (37.2) | 512 050 (13.6) |
| Total             | 2792 468       | 759 775        | 26 260        | 190 290      | 3766 610       |

¹ Public protected land area and recreation access were estimated from the Protected Areas Database of the United States (PAD-US; USGS 2012).
² Privately protected land area was reported by the Land Trust Alliance (Chang 2011), and recreation access to private protected areas was estimated from the National Conservation Easement Database (NCED 2011).
³ Protected areas that have no special requirements for public access.
⁴ Protected areas that allow no public access.
inadequate ecological monitoring on their lands, especially about recreation. As one manager explained, ‘It is a major challenge to know what is going on on the land. We lack baseline information and good data about the effects of dispersed recreation. Both USFS and BLM long have struggled to monitor recreation use in real time with confidence’ (Personal communication 2013). This lack of data has important management ramifications: lack of good scientific data makes it harder for public agencies to determine and defend management decisions to a public that may want something different than what the land actually can support.

Finally, most public agencies have limited resources to manage outdoor recreation. When asked what about the challenges in managing outdoor recreation, over 75% of land managers identified inadequate funding. Many agencies lack the staff necessary to perform basic management functions, such as trail maintenance. Funding may be particularly short for recreation management. As one federal land manager explained, ‘Recreation is a high priority as a use of public lands, but a low priority for (where the funding goes)’ (Personal communication 2013).

Management recommendations and conclusion

Greater scientific understanding of the ways in which recreation activities may undermine biodiversity protection will help western land managers navigate the inherent trade-offs and reduce conflicts between outdoor recreation and conservation goals.

First, a need exists for scientific data in key research areas that would advance the field of recreation ecology and inform conservation and management of biological resources in protected areas. In particular, management decisions would benefit from greater data on:

1. Monitor visitation patterns. The full impacts of recreation activities are impossible to understand without knowledge of the disturbance processes that are affecting species and ecosystems. Very few reserve managers collect reliable information even on how many visitors enter protected areas (Newsome et al 2013), much less when they visit, where they go within protected areas, or which activities they participate in during their visit (Hadwen et al 2007). Additionally, it is important to understand the landscape context and socioeconomic processes that are driving spatial and temporal patterns of visitation, to better inform planning processes and anticipate future demand for recreation access in reserve systems.

2. Identify thresholds of disturbance. We acknowledge that it is challenging to collect even the most basic information about how many visitors that a protected area receives, but ultimately scientists need this information in order to understand if there are thresholds of disturbance to species or ecosystems. Most studies of recreation impacts (80%) to date measure recreation as a categorical variable (Larson et al 2019); in other words, researchers compare sites with and without recreation or compare sites with low versus high levels of visitation. Instead, by measuring recreation as a continuous variable, scientists can specify response relationships and identify thresholds of recreation disturbance, in terms of the number of visitors, their spatial distribution, or the timing of their visits (Monz et al 2013). These relationships can then be translated into appropriate management thresholds.

3. Compare recreation activities. Understanding the relative effects of different types of recreation activities is a major question for reserve managers. This is especially true as recreation preferences among reserve visitors change, or as new types of recreation activities emerge (e.g. nighttime endurance events). However, relatively few studies have explicitly compared the effects of different activities at the same time, in the same place, and on the same species (e.g. Taylor and Knight 2003). These explicit comparisons are critical to resolve conflicts among user groups and create a plan that balances visitor preferences with biological conservation.

4. Assess management options. What are the options for managing the effects of recreation, and are they effective? Very few studies address this topic in an applied context—for example, by actually manipulating management activities or creating experimental designs that simulate realistic management alternatives. Yet, these are the studies that will be most useful for resolving management challenges and providing rigorous scientific evidence to support decisions to permit recreation uses or restrict public access.

Second, given the deleterious effects of creation on species across geography and species (Larson et al 2019), it is important for land managers to act to mitigate these impacts. These land managers are legally mandated to conserve natural resources, including wildlife, and must daily make decisions about acquisition, designation, and management of protected areas before the science research described above is conducted.

Fortunately, several strategies for conservation planning, identified in the literature (Larson et al 2016) and based on global lessons (Eagles et al 2002, Leung et al 2018), can benefit land managers facing these challenges in the US West. Additional research will
need to be conducted to evaluate the efficacy of these strategies for different species and ecosystems.

The solution most frequently proposed for balancing recreation and conservation objectives in protected areas is to implement management strategies that may mitigate recreation’s negative impacts. These strategies include spatial or seasonal restrictions on public access or types of recreation use, limiting the total number of visitors, or educating visitors regarding the impacts of their activities (Newsome et al 2013). Although such policies may represent the best available option for protected areas where recreation visitation is already widespread, evidence regarding their effectiveness is scant (Larson et al 2016). In particular, as demonstrated by the interviews we conducted, successful implementation of recreation management strategies within protected areas is limited by the compliance of visitors and the availability of staff and funding for monitoring and enforcement.

Given the limited capacity for enforcement of management policies, the most important decision a western land manager can make is whether or not to open a site for recreation in the first place. A related decision is whether to enforce or ignore restrictions on unofficial use. Several studies indicate that a small number of visits can have a disproportionate impact (Cole 1995), and land managers report that it is much more challenging to change access or restrict use once a site has been opened (Personal communication 2012). Thus, we recommend that land management agencies adopt a decision process that explicitly assesses the value of an individual site for its relative recreation and conservation benefits. Moreover, we recommend that institutions that provide funding for land conservation (e.g. the Land and Water Conservation Fund) require documentation of such a decision process as a condition of funding.

Both recreation and conservation are valid and valuable objectives for western public lands and open spaces. But that does not mean that they always need to be achieved in the same places. Instead, we recommend that recreation and conservation objectives be balanced across reserves in a network of protected areas. Biologists and ecologists can support recreation planning processes through the application of conservation planning principles (Ban et al 2013). Decisions to designate public access should take into account not only the characteristics and benefits of the individual site, but also that site’s value in relation to the agency’s broader objectives, overall portfolio of protected lands, and other planned acquisitions. There are several good models of local agencies’ adoption of a conservation planning process to achieve multiple objectives in a reserve network. For example, the Sonoma County Agricultural Preservation and Open Space District adopted an acquisition plan that prioritized protection efforts in four distinct categories: farms and ranches, greenbelts, natural areas, and recreation (SCAPPOS 2006). In some regions, achieving an integrated vision that balances recreation and conservation objectives may require cooperation among multiple jurisdictions.

There is cause for optimism. After recognizing and studying the consequences of natural resource extraction on species and ecosystems, past generations improved management practices within protected areas (Hays 1959). The same can be true for outdoor recreation. With more scientific research and heightened awareness about the incompatibilities between recreation and biological protection, societies can meaningfully discuss the trade-offs between public access and conservation goals, make informed management decisions about protected area management, and institute practices that ensure public recreation opportunities and successful biodiversity conservation.

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Data availability statement

Data is available from authors on reasonable request.

Appendix. Interview methods and questions for land managers

The semi-structured interviews entailed 14 structured interview questions, plus follow-up questions, designed to evaluate interviewees’ experience with outdoor recreation management, the trade-offs they view between conservation and outdoor recreation, the broader challenges they face in managing protected areas, and their notions of best management practices pertaining to outdoor recreation.

We conducted a qualitative content analysis of the responses to identify common themes and trends.

1. When was [X] protected area founded? For what purpose?
2. [If applicable] How does it manage for multiple uses?
3. What is the process for developing management plans?
4. Do you perceive a conflict between outdoor recreation and conservation? If so, how? In what circumstances?
5. How does [X] protected area try to manage this conflict, if at all?

6. Does [X] protected area conduct ecological monitoring? In your opinion, does it adequately assess ecological impacts from outdoor recreation activities?

7. Do you think the public perceives a conflict between outdoor recreation and the conservation of natural resources? If so, in what ways? If not, why not?

8. Do you encounter conflicts between different types of recreation users?

9. What do you see as the emerging trends in managing protected areas used for outdoor recreation?

10. What do you see as the major challenges in managing protected areas for recreation?

11. How do you think the challenges you face compare with those of managers of other protected areas?

12. What protected areas are managing these challenges well?

13. What do you see as best practices in managing protected areas for outdoor recreation?

14. What other land managers at protected areas do you recommend I speak with?

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