

Commentary on the special issue

Managing the natural soundscape: The National Park Service as a learning organization

By Wayne Freimund and N. S. Nicholas

INCREASED PUBLIC ACCESS TO NATIONAL PARKS IS AN important artifact of the last century's technological development. The expansion of aircraft flight-seeing, snowmobile use, and motorcycle touring are examples of technologic advancements that now commonly impact national park soundscapes (see Barber et al., pages 23, 24, and 26, and Park et al., page 59, this volume). To adequately manage these impacts, the National Park Service (NPS) must see them as part of an evolution toward a noisier society rather than as isolated, situation-specific events. The natural soundscape also needs to be perceived across society as an elemental and foundational feature of a protected area. This special issue of *Park Science* illustrates some of the ways the National Park Service is building capacity to maintain the resilience of the natural soundscape (Walker and Salt 2006) in this context. Planning, management, and research are all under way to better understand the roles and functions of natural sound in the ecologic and human values of protected areas. But key questions remain: How do changes in the natural soundscape alter the other components of a protected area to which the soundscape is fundamental? At what point will the broader system change to an entirely different state from which it may never return?

Intensified demands for soundscape management

This special issue illustrates that complex social and natural systems converge within our national parks. While each park is part of a definable yet dynamic ecological system, it is also embedded in social systems that also are evolving. Within this context the National Park Service has been challenged to expand its management scope to accommodate broadening societal demands. The accommodation of those expectations, primarily for public access, results in the natural soundscape becoming an increasingly threatened resource, nonetheless one that the National Park Service is entrusted to protect.

Peter Senge (2006) suggests that the only way an organization can continue to thrive in a complex environment (characterized by uncertainty and dynamism) is to instill a culture of learning and adaptation into the organization. Donella Meadows (1999) adds that managers should look for leverage points within the system

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where the greatest desired return can be gained for the effort. By adopting this approach, organizations are more likely to see their connections to (and therefore ability to influence) issues rather than to view them as threats from “outside forces.”

Large governmental bureaucracies such as the National Park Service are not often described as nimble and adaptive. Early organizational reactions to “threats” to soundscape resources included legislation, reports to Congress, and development of policies (NPS 2006) and related director's orders (NPS 2000) for planning. For example, the Grand Canyon Enlargement Act of 1975 first explicitly identified “natural quiet as a value or resource to be protected from significant adverse effect” (NPS 1995). However, when the Natural Sounds Program was established in 2000, the National Park Service took an important step in building the organizational learning needed to understand and manage natural soundscapes in the longer term. The Natural Sounds Program “addresses sound-related matters raised by Congress, *NPS Management Policies*, and NPS director's orders. The general mission of the Sounds Program is to “protect, maintain, or restore acoustic environments throughout the National Park System by working in partnership with parks and others to increase scientific understanding and public appreciation of the value of soundscapes” (see Marin and Selleck, page 9, this volume).

Exploring soundscape issues

The Natural Sounds Program provides technical acoustic expertise and assistance. It also is building a critical mass of scientists,

planners, and managers to grapple with natural soundscape issues within and external to the National Park Service. Within this broad array of expertise is the potential for examining the social and ecological system in which soundscape issues related to national parks persist. While issues often emanate from changes in society, they also must be negotiated through the complex relationships between the National Park Service and society. The traditions and structure of the National Park Service, which are dynamic but slow to change, also need to be negotiated to develop meaningful support to the various actors in the system. Finally, relative to many important issues (e.g., endangered species, air quality, wildfire), there is limited factual information about the relationships of the soundscape to either the ecologic or social values that policy formulation is based on.

The Natural Sounds Program is building a learning system that integrates the relationships among all components of the social-ecological system related to soundscape issues. This special issue documents considerable progress in bringing a wide variety of professionals together to better understand natural soundscape management issues. They have engaged in dialogue and encouraged programmatic learning. We see a merging of technical acoustics research with ecological and social sciences and their

application to planning. The Natural Sounds Program serves as the catalyst for numerous forums on soundscape management, including special sessions at conferences, workshops dedicated to developing a research agenda, and numerous informal forms of communication. Considerable learning has occurred through this dialogue and from research and programs for framing future questions, which are emerging (see Manning et al., page 54, this volume).

Becoming a true learning organization

Though the challenges are great, the National Park Service is off to an exciting start with the Natural Sounds Program. This program should expand the ways in which knowledge about functions and values of natural soundscapes are developed, processed, and used. Science, dialogue with visitors and the public, and professional judgment will all be sources for that knowledge. We offer a conceptualization of four primary dimensions for the natural soundscape management that include societal, institutional, ecological, and social/experiential (fig. 1) dimensions. This conceptualization provides one way to consider which kinds of understanding need to be built over time.

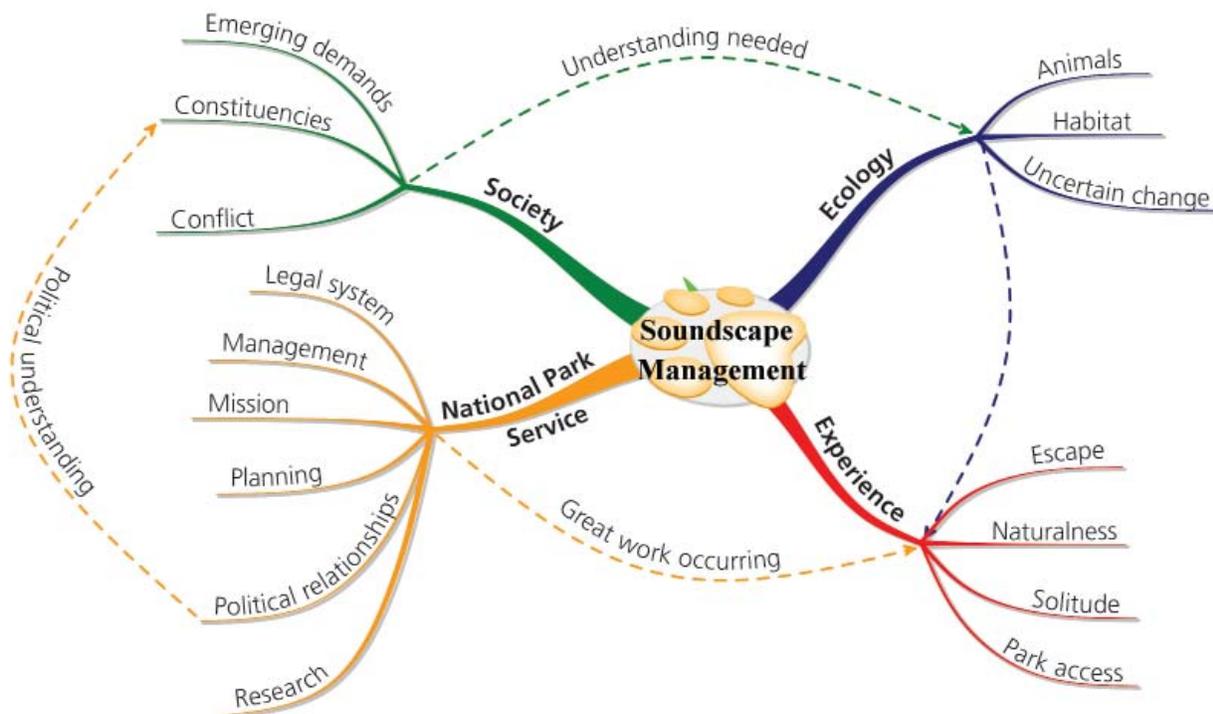


Figure 1. The complexity of natural soundscape management is illustrated by the connections among society, the National Park Service, park ecology, and the visitor experience.

The articles in this special issue illustrate that there is more progress in some of these dimensions than others. For example, Park et al. (page 59, this volume) demonstrate an experiential relationship through the limited opportunity for visitors to experience parks without interference from human sounds. Similarly, Barber et al. (page 23, this volume) illustrate cumulative impacts of noise on wildlife. These kinds of studies are valuable and illustrate fundamental relationships between soundscapes and other park values. Continuing with this type of work will reap benefits as we see patterns continue to emerge across varied social and ecological contexts. However, in our opinion, we also need studies of the National Park Service as an institution to see how innovations can be integrated into broader management and other functions as efficiently as possible. The roles and importance of natural soundscapes in society also need to be better understood and articulated, a process that is under way, as this issue of *Park Science* demonstrates.

The conceptualization further illustrates the need to bridge the dimensions of our understanding. For example, while we have studies of ecologic or social impacts related to sound, we have done little empirically to understand these issues in an integrated way. For example, do visitors have a primarily biocentric or anthropocentric orientation to the natural soundscape? How did they develop these perceptions? Does this make a difference in which types of management interventions they may support? Do park visitors reflect a broader population within society? If so, what implications does that have for soundscape or visitor management?

We can also see the need to better understand what mediates the relationships between the National Park Service as an institution and society as a whole. For example, the authors have often heard from park employees and activist group members that the Service lacks the political will to implement the stringent constraints on visitor access that would be necessary to protect natural soundscapes. We need a better scientific understanding of topics like “political will” and “political support” generally. When and how can political will be developed within an agency? How can the demands emerging from society be better anticipated and addressed before they become a political crisis? In essence, how can the National Park Service, or any other land management agency, become more proactive, less reactionary? The literature on natural soundscapes lacks critical contributions by the kinds of political (or other social) scientists who study these kinds of questions.

This special issue represents a good beginning on a long process that will be best served if the complexity of soundscape management continues to be engaged. Purposeful dialogue on soundscape issues among the managers, planners, scientists, and

public needs to be encouraged and continued. The National Park Service has the opportunity for true national leadership on this issue and must continue to clarify where the natural soundscape fits into its priorities for protection. It must also continue to build the institutional capacity to execute protection of this resource for the long term.

Each of us tends to see our own crises as in need of the most attention. While we are addressing emerging crises, we also need to look for the patterns and structures within the events to be sure we are dealing with causes rather than symptoms and that we are learning all we can in the process. From that learning, we will ask the kinds of questions that will help us conceptualize our national parks as places where societal relationships are strong and natural soundscapes thrive. That is our collective challenge.

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