Integration of Social Science into Protected Area Stewardship: Challenges and Opportunities

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Introduction

That the stewardship of protected areas remains a contentious and challenging task is not news to any manager, scientist, or citizen confronting the complex, contentious, and often confusing realities of stewardship today. Protected areas exist within a social and political dynamic that is as difficult to understand and predict as any situation. A variety of threats and relationships that are complex, often obscure, and involve a wide variety of forces at different scales, leading to consequences at later times and other places, challenge even the most competent park steward. Increasing calls for science-based decision-making are centered at least partly on the argument that science can provide meaningful information upon which policy is formulated and decisions are made. Indeed, a number of commissions and reports over at least the last 40 years have recommended increased attention to the sciences by the National Park Service (NPS) in order to better understand the values and processes protected within the National Park System (e.g., the Advisory Board on Wildlife Management chaired by A. Starker Leopold).

The social sciences are one of the scientific legs upon which successful protected area stewardship relies. This stewardship involves decisions that protect, enhance, or restore not only the values for which parks, wilderness, and other types of protected areas are established, but also the degree of care and concern for the people and communities that are inevitably linked to and affected by stewardship decisions. The social sciences help stewardship by creating knowledge concerning the values protected, the decision processes used in stewardship, the beliefs people hold by these values, and recreation opportunities and the connections people and communities hold with parks and other protected areas.

Originally, much of the social science involving protected areas was focused on creating a scientific base for management of visitors. This was critically important, for in the very early 1960s there were cries that the national parks were increasingly crowded and not meeting the expectations held by visitors. Despite NPS attempts to increase the physical capability of the parks to handle more visitors through Mission 66, issues of use density, quality of experiences, and impacts to the natural and cultural heritage from such use demanded considerable and continuing research attention.

From the early focus on recreation, the social sciences have expanded to assist in a broader arena of stewardship issues. And yet, despite the potential for improving the quality of stewardship, substantial barriers to the social sciences remain. In this paper, I wish to discuss the major challenges facing use of social science research. In doing so, I will specifically discuss the criticism that the social sciences are "subjective" and therefore not credible sources of knowledge. I then suggest the potential of the social sciences to address six fundamental areas of protected area stewardship.

The Research Applications System

Social science research, like other forms of science, exists within a complex, interactive and vibrant social and institutional system that involves scientists, managers, and technology transfer specialists working for agencies that have both responsibilities and agendas. This system, represented as shown in Figure 1 and defined in Table 1, provides us with a framework to portray and understand the challenges confronting use of the social sciences in protected area stewardship (Havelock 1972; McCool and Schreyer 1977). The fundamental assumption of this model is that research

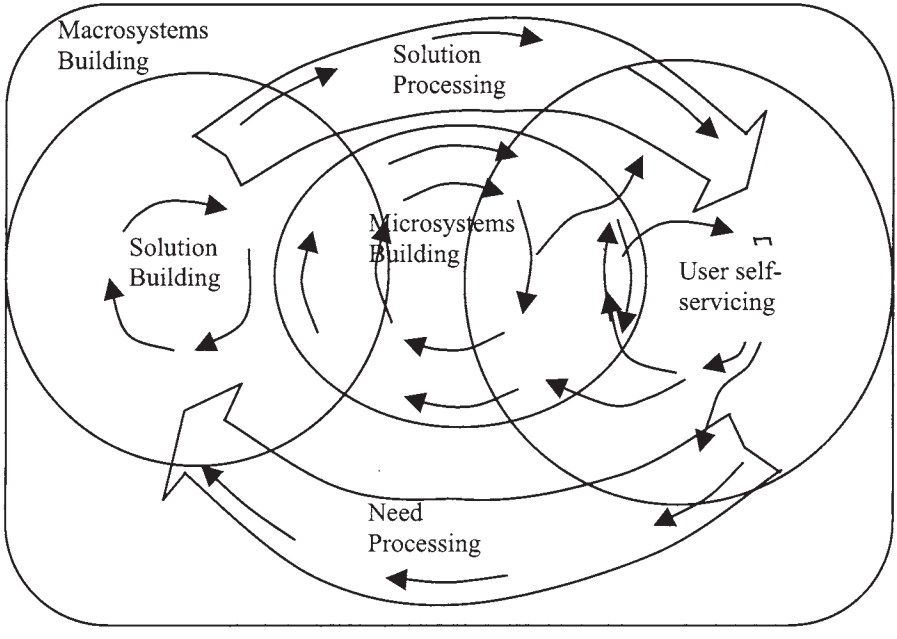

Figure 1. The research applications system (source: Havelock 1972)

exists to improve the human condition—in this case to raise the quality of protected area stewardship so that the values for which they are designated are indeed shielded from various threats and inappropriate uses.

Current Challenges Facing the Social Sciences in Protected Area Stewardship

Figure 1 provides an overall framework for understanding where challenges occur in research and applications; it certainly shows that there are countless potential challenges in every aspect of protected area stewardship involving the use of science. For the purposes of this paper, however, I would like to focus on three particularly thorny challenges that are pervasive, influential, and affect how social sciences are viewed and used. These challenges help frame the criticism that social sciences are subjective and thus there is an issue of their legitimacy in science-based processes.

Institutional and systemic barriers to change. Major macrosystem changes influence what research is conducted, how it is conceptualized, and how it might be used. Several of the more significant and salient changes are depicted in Table 2. Our notions of protected area stewardship derive primarily from 20th-century Progressive Era perceptions of the role of government and experts in policy development and decision-making: planners employed by public agencies were presumed to represent the public interest (McGarity 1990), which at one time appeared to be unified and of one voice. The Progressives sought to instill a political system that utilized scientific management guided by "neutral and objective" experts to serve the public interest; in a sense, the application of science would reveal this interest. Agency decision-making would be both professional and objective to avoid the appearance of bias while relying "upon professionals to set policy based upon a congressional goal and an examination of the facts" (Poisner 1996:76).

Moreover, Progressive Era approaches still dominate natural resource planning today, as demonstrated by natural resource agencies' faith in scientific expertise (e.g., the Forest Service planning rule proposed in fall 2000 to

Table 1. Definitions of terms used in Figure 1 (source: Havelock 1972)

Macrosystem building provides the context for social science and its application. Macrosystems involve the institutional context that provides incentives for social scientists to conduct research and solution processing, and for managers to apply social science information. In addition, the beliefs held by both managers and scientists structure how problems are framed; how problems are framed determines what "answers" are provided.

User self-servicing represents the ability of the manager to address problems and develop solutions to them. While this initially appears to be a totally managerial function, social scientists play at least three significant roles here. First, social scientists help managers identify, define, and frame these issues. Second, through two-way interaction, the scientist helps managers translate a problem into a testable hypothesis and thus provide the framework for adaptive management approaches. Third, scientists help managers become more familiar with existing literature and problem-solving approaches used elsewhere.

Need processing involves communicating the "felt pain" of a problem or issue to the scientist. This inherently means that managers must acknowledge that there are social science dimensions to the problem (most protected area stewardship issues have these dimensions), have an awareness that social science is an appropriate tool, and recognize that there are scientists available that can be utilized. Such need processing requires a substantial investment in translating challenges into testable hypotheses; these investments are needed by both managers and scientists.

Solution building entails scientific activity to develop responses to the problem, usually in the form of data and information and sometimes in the form of knowledge. Solution building is the knowledge acquisition component of the research applications process, and it is here where the charge that social science is subjective is leveled.

Solution processing means that the data collected and analyzed by the scientist must be transformed into information and knowledge useful for the resolution of the problem confronting the protected area manager. In many natural resource situations, such solution processing is done in conjunction with extension agents, who work closely with both scientists and users. However, the protected area management system generally lacks the structural equivalent of extension agents and thus social scientists must often assume that role.

Microsystems building includes small-scale, small-group interactions, generally with researchers and managers collaborating on projects and problems. It is here where the relationships necessary to knowledge utilization are built. The extent to which the participants in such interactions develop common languages, overlapping perspectives, and shared paradigms encourages not only the transfer and application of knowledge but also increases the probability of science developing information useful to managers and managers using such information to resolve problems.

Table 2. Changes influencing the use of science in protected areas

- Era of change in our notions of protected area stewardship—larger spatial, temporal, and social–organizational scales
- Recognition that we cannot continue to treat protected areas as isolated entities in a sea of development
- Broadening expectations of protected area functions, particularly natural ones
- Changes in systems of planning governance, involving primarily increased demand for intimate public engagement in decision-making

increase the role of science in national forest planning) and the reluctance of agency planners to relinquish control and involve the public in a substantive and meaningful way in stewardship decisions. Advocates of synoptic planning continue to encourage divorcing decision-making from politics and to only allow public participation in a manner that

conforms to an expert-based model (i.e., public participation serves primarily as a method of information collection and education).

These foundations remain immensely influential, not only in designing planning processes but also in the realm of science, the views managers hold on science and how science is used. Progressive Era science is viewed as an "objective" endeavor: problems only require the application of more science to be solved, and through science the public interest can be exposed. These fundamental assumptions conflict with the reality of protected area stewardship today: what science is done and how it is conducted often is a result of political pressures; many problems of stewardship are those of conflicting values, problems which science is ill-suited to solve; and the public interest can only be *constructed* through serious, deliberative consideration rather by being *revealed* by science.

Management of parks is a socially problematic challenge; as such its basis is in how values may conflict, collide, and reinforce each other. Struggles about park management are essentially political and value-laden. The extent to which synoptic views of planning and science are held in an increasingly messy and tumultuous world suggests the extent to which we will have failures in identifying and framing problems, conducting relevant research, and resolving the problems and challenges of protected area stewardship.

Methods and approaches to stewardship that marginalize non-quantitative knowledge. Twentieth-century park science could be described as one in which empiricist approaches emphasizing quantitative measurements and analysis dominated. Quantitative methodologies have benefited stewardship greatly, contributing to significant understanding of the processes and places land management agencies have been mandated to protect. And while our understanding has greatly advanced, there has been a tendency to marginalize other approaches to science, specifically approaches in the social sciences that are based on qualitative research. Qualitative approaches are often criticized as being not representative, subjective, and uninformative.

But, as Thomas Kuhn (1970) has noted, paradigms of science change. In the social sciences, there has been an accelerating interest in qualitative approaches to stewardship issues. Qualitative social science has been around for a long time (as has qualitative methodology in biology), but the recent rise in interest results from some dissatisfaction of the quantitative model and an interest in approaches that provide scientists opportunities to explore deeper understandings. Qualitative approaches help map out the dimensions of research questions (e.g., what makes public participation successful, what meanings people attach to landscapes, what were critical events in a stewardship issue) and provide both scientists and managers with important information about how people perceive various issues and challenges.

Discipline-based decision-making. As our knowledge of stewardship has advanced, we have also come to understand that the current dominance of disciplinary-oriented research and management is no longer adequate in resolving the contentious issues confronting park stewards. Rarely is a problem the sole domain of a particular discipline. Managing bison in Yellowstone National Park is an example. Bison populations interact with snowmobiling and other visitor activities, but how is neither clear nor definitively understood. Creating knowledge that will assist park managers requires not only biology, but landscape ecology, sociology, psychology, and management science as well.

Discipline-based decision-making and research results in a reductionistic, fragmented view of protected area issues. Such perspectives, when generated by research, leave managers unable to fully access the consequences of their decisions and result in protected areas continuing to be vulnerable to various threats. Integrated research—across scales, disciplines, and forms of knowledge—shaped by common problem framing, provides decision-makers with a more holistic understanding.

The Issue of Subjectivity in Social Sciences

Social science research is often criticized as being "subjective" and thus does not have the validity of the biophysical sciences. If science is viewed as the acquisition of knowledge, subjectivity must mean that there are distortions in the "reality" portrayed by that knowledge. To be subjective, those distortions would be a function of the individual perspectives and value systems of the scientist. Each of us observes the world, either as a regular guy or as a scientist through the lens of a particular paradigm. Those paradigms definitively determine what we see, what variables are chosen to be observed, and how the resulting data are used to describe the so-called real world.

The distortion of reality would occur in three ways. First, the scientist has used personal judgment in the process of acquiring knowledge rather than relying on some "external" criterion. Yet the personal judgments of any scientist enters into the research process in terms of problem definition, choice of methodologies, selection of variables and how they will be measured, data analysis and interpretation of results. This view of subjectivity in science would apply to the biophysical sciences as well, but in a way that is somewhat different. Thompson (2001:65) notes that "the positivist model simply obscures the values inherent in all science." Thus, measurement of things such as animal populations, tree diameters, coliform colonies, reproductive rates, and soil types gives the appearance of objectivity, when in reality the choices made in the research process are as subjective as in the social sciences. As scientists in any field we tend to use shared paradigms to determine what variables are measured and how. And, indeed, when there are conflicts in paradigms, there is much debate over which variables are measured. The scientific method requires that the choices made by scientists be made public; and it is this very explicitness that is one of the foundations of any scientific enterprise.

Second, subjectivity may occur when the variables being measured are intangible. Intangible variables are those that "are based on observations but that cannot be observed directly or indirectly" (Babbie 2001:121). An example might be attitudes toward use density. These variables are known as *constructs* (Kaplan 1964). And while constructs cannot be measured directly and there may be some questions about them being *real* in the sense of a rock or tree, they can be *useful*. Babbie argues that these types of variables "can work this way because while not real or observable in themselves, they have a definite relationship to things that are real and observable" (2001:122).

I note here that the biophysical sciences also rely on constructs that are not real in the sense of being directly observable and are constructed from measurements of other variables. These include such concepts as biological diversity, forest health, succession, and spatial scale. Thus, in this sense, the charge of subjectivity applies to social and biophysical sciences as well.

Third, subjectivity may connote that the meaning of a concept or variable is highly personal, depending on the perspective of an individual scientist. A concept—crowding, for example—may evoke different images in different scientists. The only way in which we can effectively communicate what we mean when we say the term "crowding" is by explicating the characteristics of this term: large numbers of people, small area, inappropriate behavior, goals and objectives explicit, and so on. By making our conceptions explicit and deliberating on them, we as scientists and managers come to agreement on their meaning, and thus, while the concept may be termed a subjective one, it may enjoy wide agreement on its meaning. So, the concept "crowding" may come to mean a "negative normative evaluation of use density."

In summary then, the criticism of subjectivity may indeed by valid, but it is by no means limited to the social sciences. The biophysical sciences are also equally subject to this charge. More importantly, the challenge for scientists is developing mechanisms to explicate and provide rationales for decisions and apply the test of usefulness to their constructs.

Table 3. Opportunities for social sciences in stewardship of protected areas

- Understanding the values protected
- Developing decision and planning mechanisms
- Framing the question of protected area stewardship
- Providing the knowledge base to ensure that stewardship decisions can be implemented
- Understanding the consequences
- Challenging paradigms of stewardship

Expanding Domains of Social Science Research

At the same time that the social sciences are faced with changes in research paradigms at the macrosystem level, the roles of these sciences are enlarging. The reasons for this expansion are complex, but probably most influenced by changing expectations of the goods and services parks provide, deepening understanding of the purposes of protected areas, realization that protected areas and communities are inevitably and strongly linked, an interest in ensuring that plans that protect these special places can be implemented, and an expanding definition of the stewardship needs of protected areas. These encompass three primary goals: (1) protecting the values for which an area was designated; (2) providing for the quality-of-life needs of citizens; and (3) enhancing economic opportunity.

The potential contributions of the social sciences to accomplishing these three goals involve six areas as shown in Table 3.

Conclusions

Protected area stewardship is at a critical junction. The issues confronting these areas have grown not only increasingly complex but have accelerated in contentiousness. The social sciences can make significant contributions to their resolution, but only if large-scale social and institutional systems encourage deeper manager–researcher interaction, recognize the validity of research, and reward effective use of integrated approaches.

All research is subjective at some point, so this criticism, frequently pointed toward the social sciences, is not limited to them but encompasses other sciences as well. Scientists can attack this criticism by both pointing out its weaknesses, by making research assumptions more explicit, and showing the utility of major constructs in predicting and understanding other variables of interest.

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