

# **Social Science and Protected Area Management: The Principles of Partnership**

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## **INTRODUCTION**

The management of protected areas is necessarily the management of people, for kin, community, class, and culture are fundamental units in the use, conservation, and preservation of natural resources. In the past decade, there has been a growing realization within the conservation movement that biophysical and social systems are inextricably intertwined. Hence, the social sciences have emerged as a potential partner to conservation in general, and protected area management in particular. As the theme of the Fourth World Congress is enhancing the role of protected areas in sustaining society, the social sciences and protected area management seem poised for important cooperation. The purpose of this paper is to describe this partnership and make recommendations for improvement.

Several questions guide the analysis: What do protected area managers need that social science might provide? What exactly have the social sciences contributed that is "usable knowledge" for protected area managers? What contributions can be expected in the future? What is required to enable the social sciences to become an integral part of the protected area movement?

The answers attempted here are personal and subjective; other social scientists would likely provide different views and opinions. While the scope is international, the limits of language result in a general reliance on my experience with the English-language scientific literature. An overview and synthesis is intended, rather than a review of research results. The recommendations are, it is hoped, significant and amenable to action.

What is meant by "social science?" While definitions vary (and often confuse rather than clarify), the key characteristic of social science is the application of the scientific method to understanding social behavior. Those academic disciplines that include significant amounts of social science are anthropology, economics, geography, psychology, political science, and sociology. The distinctions between "real science" and social science, or between the "hard" and "soft" sciences, are largely intellectual marking of territory and of little importance: there is really only the scientific method, poorly or well-applied. Nor is any one social science necessarily preeminent; all have the potential to contribute to conservation. While there are organizational differences between basic research (pursuing knowledge for its own sake) and applied research (pursuing knowledge for a specific purpose), the scientific method remains essential for both. There are differences in the practice of social science from one country to another (sociology is practiced differently in Canada than in Cuba); I stress the similarities.

The paper is organized as follows. First, I suggest two central principles for partnership between protected area management and the social sciences: *the social sciences must provide "usable knowledge" to managers, and managers must integrate this knowledge into decision-making.* Since the scale

of management is so crucial (what is usable knowledge for a local park superintendent may be of little value to a national park director), the concept of "scale-dependent management" is applied to protected area management, and several critical issues facing managers at each site are described. These issues represent the information needs that the social sciences should be able to help satisfy. Next, I critically evaluate the contributions of the social sciences, comparatively examining each discipline for its central focus and potential. Since the results are frustrating to both social scientist and protected area manager, a set of recommendations for invigorating the partnership between scientist and manager are presented.

#### **USABLE KNOWLEDGE AND THE PRINCIPLES OF PARTNERSHIP**

Protected area managers are faced with an often bewildering and complex set of decisions, most of which must be made relatively quickly, simultaneously, without complete information or understanding, and with feedback effects that then must also be dealt with by additional decision-making. A majority of these decisions have a socio-economic or socio-political component: actions to be taken will likely have important impacts upon the wider social system. Hence there is an almost continual opportunity for social science to assist in making such decisions, if it can provide "usable knowledge." The criteria for usable knowledge related to protected area decision-making are specific:

- The information must be provided at the proper point in the decision-making process. Timeliness is critical.
- The information must directly address the manager's needs and at a level of detail appropriate to the decision.

■ The manager must understand the limitations of the data, the degree to which it can be applied, the certainty (or lack thereof) of successful application, and the authoritativeness of the authors.

Hence, a research project completed too late, dealing with issues of only tangential relevance to a manager's decision-making needs, presented without limits or explanation, and by scientists of unknown credibility will not likely result in usable knowledge. Note that such research could be excellent, even brilliant, science; it would still remain outside the boundaries of usable knowledge. A first principle for organizing an effective partnership can thus be stated: *The social sciences must provide usable knowledge to protected area managers.*

While the decision-making activities of protected area managers are often undertaken within a complex socio-political context, the use of scientific information in such decision-making is, in reality, quite limited. Information from the biophysical sciences is more likely to be employed than the social sciences; a water quality assessment or game population estimate is more likely to enter into a resource management decision than an employee survey is into an administrative one. Protected area managers often use common sense, folk knowledge, field experience, and ideological views to make decisions, and usable knowledge from the social sciences is frequently ignored or avoided.

In many cases, managers may not be aware of or understand the potential advantage of using social science information. Often, protected area managers are uncomfortable integrating scientific information into their decision-making. Scientific advice often limits the range of decision alternatives available to the

manager, by identifying unacceptable consequences, prioritizing choices along scientific rather than political criteria, and creating the need for managers to defend their rationale for not following such delivered advice. For all these reasons, what occurs is *ad hoc* and fragmented use of social science information. Its potential is not being fully exploited. A second organizing principle for a full, effective partnership can thus be stated: *Protected area managers must integrate the usable knowledge of social science into decision-making.* How such integration might realistically occur, and to what degree protected area managers might profit from using social science, is discussed shortly.

### THE CRITICAL IMPORTANCE OF SCALE

Protected area management takes place at significantly different scales, and the issue of scale is central to the partnership of science (social and biological) and conservation. Table 1 illustrates the major scales of protected area management. For each, there are key organizational units to be considered in decision-making. At the *protected area* level, key units of organization include visitor groups, resident populations, park staff, and within-park enterprises. At the *region* level, the park is seen as imbedded in a wider ecological and social system, with boundaries conceptually defined rather than gazetted. Regional units of concern include local communities, states and provinces, regional offices of park and other natural resource agencies, regional markets, and service economies.

At the *national* level, key units are the national legislatures, central administrations, large non-governmental organizations (NGOs), the media, and other national agencies managing resources. At the *realm* level, international organizations and other nations' park agencies are central.

**Table 1. Scales of protected area management and key organizational units**

Scale of Protected Area System	Key Organizational Units
<i>Protected Area</i>	visitor groups resident populations park staff concessions
<i>Region</i>	local communities states and provinces regional offices regional service economies
<i>National Protected Area System</i>	national legislatures central park administrations national NGOs national travel industries bilateral NGOs
<i>Realm</i>	international NGOs international treaty organizations
<i>Global System</i>	national NGOs international travel industry United Nations

At the emerging *global* level, international NGOs, treaty organizations, and world markets become significant organizational units.

At each scale, the decision-making process of protected area managers will vary, as different organizational units and political contexts interact. That is, the management of protected areas is *scale-dependent*. In addition, each level of management is significantly influenced by the adjacent levels, and are in actuality parts of a nested system of protected area management. Information needs of protected area managers will differ at each scale, though contributing to an overall set of needs. Hence, what will be considered usable knowledge at one scale may be irrelevant or of little use at another.

Table 2 illustrates this idea of scale dependency. At each scale, a

set of primary ecosystem and institutional issues are suggested. Each are linked to management issues at other scales; for example, habitat change and population loss at the protected area level can contribute to habitat fragmentation and species loss at the regional level; policy formation is a major institutional issue at the national level, and a significant component of strategic planning and international cooperation at the global level. Since these scales largely determine the social science information needs of protected area managers, we discuss each level in turn.

**Protected Area** Three organizational units predominate at the park level: visitor groups, resident populations, and employees. Managers at the protected area level need to document the social ecology of visi-

**Table 2. Key issues by scale of management**

Scale of Protected Area System	Key Ecosystem Issues	Key Institutional Issues
<i>Protected Area</i>	population loss habitat conversion exotic introductions ecosystem effects	visitor services resource management sustainability local populations
<i>Region</i>	habitat fragmentation species loss ecosystem stress	training monitoring coordination policy implementation
<i>National Protected Area System</i>	reduced biodiversity species loss	policy formation funding acquisition development strategies
<i>Realm</i>	reduced biodiversity species diversity	international cooperation
<i>Global System</i>	reduced biodiversity  climate change	international cooperation and assistance strategic planning

tors, i.e., the relationship of visitors to the park environment. Their distribution, abundance, demographic composition, behaviors, and resource demands are all important variables in determining ecosystem impacts and viable resource management strategies. Visitor wants, needs, opinions, and expenditure patterns are valuable in policy and marketing decisions. To be useful, such information must be contemporary, area-specific, and, where visitation varies by season, season-specific. In addition, managers need ways to predict changes in visitor use, effectively manage visitor services, design efficient facilities, and readily communicate protected area values to visitors.

Resident populations present managers at this level with a different set of information needs. The numbers, distribution and demo-

graphic composition of resident populations are of course important. In addition, there is the need to understand sustenance and cultural requirements of such peoples, and their impact upon park resources. Information must be area-specific, accurate, and sensitive to cultural differences. Managers need strategies for coordinating decision-making with resident political structures, and for setting sustainable levels of resident economic activity while protecting park values.

Employees are also a crucial organizational unit, and at the protected area level several information needs emerge. Employee job satisfaction, morale, and concerns should be monitored as a feedback mechanism for improved administration. The information must be area-specific, accurate, and timely. Managers

need effective supervision, training, and staff development techniques.

**Region** While protected areas are largely defined by their legal or political boundaries, or both, protected area regions include the protected area and adjacent, related ecosystems and human communities. Biosphere reserves are an exception, being (in the ideal) institutionalized protected area regions. Several organizational units are crucial to the management of such regions, and present managers at the regional level with a unique set of concerns. Local communities are an example. These communities, particularly those at or near gateways to protected areas, produce several information needs. These include an understanding of population trends and economic activity levels, a grasp of critical cultural values, political structures, and leadership processes, and the dependency of such communities upon park and regional resources. Assessment of sustainable development levels, prediction of social and economic impacts of policy decisions, and strategies for effective public involvement are all valuable management tools.

Other examples are institutions, particularly regional and provincial governments. Here, managers need an understanding of regional political processes (both ideal and real), power-sharing arrangements (both formal and informal), and agency decision-making. As protected areas are increasingly used as tools for economic development, knowledge of regional economic trends (including labor and capital flows) is both valuable and necessary. Strategies for evaluating the social and economic impacts of regional development projects, and for interagency coordination of governmental activities, are needed.

**Nation** Managers at the national level are faced with yet another set of organizational units. National

legislatures, central agency administrations, national NGOs, media, and industrial sectors (such as the tourism industry) are examples. Information needs vary dramatically from previous levels. For example, while area managers need specific, seasonal descriptive information about park visitors, national managers do not; they need accurate statistics on total visitation levels, including trends, future projections, and, to a lesser extent, regional distributions. Data on the economic impact of protected areas are politically valuable, as are techniques for predicting future trends in visitor use, and principles for design of standardized facilities and services.

Administration is a central concern at this level, and information required for effective administration includes staffing requirements (both current and projected), inventory of human and financial resources, and evaluation of subordinate managers. Techniques for allocating scarce resources, monitoring the status of individual protected areas and regions, and training and supervision of employees are all required at this level. National policy initiatives, head-of-state decisions, and media influence are crucial elements in decision-making, and the ability to conduct policy analysis, respond to executive information requests, and monitor public opinion is both valued and necessary.

**Realm** Managing protected areas at the realm level is an example of emerging scale, and fewer kinds of organizational units have evolved than at the other levels so far described. International NGOs, bilateral cooperative ventures (through treaty, contract or agreement) and nascent realm organizations (such as that within IUCN) are examples. Management largely involves strategic planning, monitoring, training, the administration of international aid programs and technical assistance. Information needs include

assessment of research and development applications, monitoring of critical problems (both general and endemic to the realm) either at the national or area level, and assessment of technical assistance needs. Strategies for improving the efficacy of technical assistance programs, enhancing the adoption and diffusion of innovations, increasing communication between national level managers and networking among NGOs are significant needs.

**Global System** Like realm management, global system management is an emerging scale in conservation, and particularly in protected area management. Organizational units include the United Nations (and its subsidiary institutions), IUCN (and its subsidiary commissions), the globally operating NGOs (such as World Wildlife Fund), and national NGOs with international agendas. Also included are the developed nations' donor agencies, and world trade associations related to travel, tourism, and natural resource production. Management tasks revolve around strategic planning, allocation of resources, and technical assistance. Hence information needs of these managers tend to be monitoring of global trends (often using national-level data) and policy analysis. The ability to provide documentation and support for global initiatives, as well as assess the viability of conservation strategies within different social, political, and economic systems, are paramount needs of managers at this level.

The scale dependency of protected area management creates a wide range of information needs that can be addressed by the social sciences. However, it is not realistic to expect all of the social sciences to contribute equally to usable knowledge at each management scale. The social sciences diverge according to their key units of analysis, central concerns, and experience in protected area management issues.

I now turn to a brief description of the various disciplines and their contribution to protected area management.

### THE SOCIAL SCIENCES DESCRIBED

A history and description of the social sciences is neither possible nor necessary here; brief remarks as to the scope of the social sciences may be useful. Orthodox approaches place six disciplines in the social sciences: anthropology, economics, geography (human rather than physical), psychology, political science, and sociology. History is marginally excluded. Contrary to conventional wisdom, the social sciences are not a particularly young; economics for example, long precedes the development of modern chemistry and most of the social sciences precede ecology.

These sciences have much in common: research techniques such as social surveys and experiments are used by each and all. Boundaries between the sciences are nebulous and prone to arcane distinctions; subfields such as social psychology and economic sociology flourish in academe. New specializations emerge yearly, tracking the growth of knowledge (some of it usable knowledge) and the search for "relevance," funding, or both. Attend a meeting of modern geographers: there are papers being presented about *everything*.

For the protected area manager, what may be useful is a comparison of each discipline's special focus, i.e., where the discipline has traditionally concentrated intellect and effort. A "map" of the social sciences can be described in preliminary terms. Table 3 provides a basic outline, organizing the sciences around their key units of analysis (the scale of things they study) and the central "engine" of change (the driving forces considered most important).

**Table 3. A basic outline of the social sciences**

Discipline	Key Units of Analysis	Engine of Change (Driving Forces)
<i>Anthropology</i>	communities subcultures cultures	tradition & culture
<i>Economics</i>	markets industries	economic value
<i>Geography</i>	regions landscapes	spatial distribution
<i>Psychology</i>	individuals	communication
<i>Political Science</i>	institutions states	power
<i>Sociology</i>	social groups organizations communities	conflict & cohesion

*Anthropology* focuses primarily upon social groupings that are intensely cultural: communities, sub-cultural groups, and even entire cultures themselves. The driving forces are primarily cultural change, with the role of tradition being a critical interest. *Economics* (which could be split into macro- and micro-economics) treats markets, industries, and economies as key units of study; the driving force of change is economic value (broadly defined). *Geography* (specifically human geography) treats regions, landscapes, and other spatial units (governmental, environmental, and so forth) as critical, and the spatial distribution of people, resources, and culture is seen as a significant driving force. *Psychology*'s key unit is the individual, and communication of meaning (within and between individuals) is a central driving force. *Political science* focuses upon the institutions of state (at many levels); the central engine

of change to many political scientists is power and its use. *Sociology* treats social groups, organizations, and communities as key units of analysis, with conflict and cohesion as central forces driving change.

Several patterns emerge. The social sciences overlap considerably as to their units of analysis: a protected area manager interested in learning about a local community's culture could reasonably employ an anthropologist, political scientist, or sociologist. The sciences reflect the complexity of human social behavior: tradition, value, power, and space are all considered critical to understanding the human condition. To the extent that protected area management must also deal with the human condition (a central theme of this Congress), the social sciences have the *potential* to be relevant and useful. What has been their contribution?



## THE CONTRIBUTIONS OF SOCIAL SCIENCE TO PROTECTED AREA MANAGEMENT

The social sciences have, since the early 1970s, made considerable progress in their understanding of issues related to conservation generally, and park management specifically. An example is in economics, where concepts such as maximum sustained yield and marginal opportunity cost have been employed to better grasp the causes and consequences of natural resource production. A review of the literature is impractical: literally hundreds of articles, essays, research reports, and books are published worldwide each month.

The contributions of *usable knowledge* are, however more modest. Numerous social scientists are working on specific projects that have or will produce useful results; their work is admirable and indicative of the social sciences' potential. If, however, we move from individuals to more widespread contributions, i.e., search for a pattern of sustained usable knowledge, then the results are meager and frustrating. Some examples, organized by the scale of protected area management, are described below.

At the protected area level, most usable knowledge has been the result of applying social science research techniques rather than their theoretical understanding or prediction. Visitor surveys have become common, though they are irregularly taken, often poorly designed and administered, and seldom archived for future use as baseline data. Protected area managers have used survey results to "better understand" their visitors, establish the economic impact of tourism, and evaluate visitor services. Their use in decision-making has been largely limited to influencing minor policy changes and facility design. Geography's melding of simple map over-

lays and modern computing has resulted in an increasing use of geographic information systems (GIS). Most digitized data have been biological rather than social, and the maps produced have been largely used as inventories. Several techniques for limiting or centrally planning visitor use have been adopted by protected area management agencies, derived from an amalgam of social science theory (primarily psychology) and field studies. Examples are the visitor impact management and limits of acceptable change techniques developed in the United States.

At the regional level, several of the social sciences (particularly anthropology and sociology) have provided protected area managers with usable knowledge regarding local populations and communities. The results, usually detailed cultural descriptions, have increasingly been integrated into decision-making by donor agencies and technical assistance programs, and, to a lesser extent, into protected area planning. Economic analyses have in recent years begun to provide input into the strategic planning of sustainable development; since "sustainability" takes years to assess, the value of such inputs remains to be seen. At the national level, the contributions of usable knowledge are especially sparse. Some basic data collection is continuous at this level, but it is of relatively chaotic quality and most often used by the media and in budget justifications. Economic measurement of protected area economic activity has been visible, yet its integration into decision-making is primarily through the political system, as leadership groups vie for dominance over resources on marginal, public, or communal lands.

At the realm and global levels, social science has provided a minor but growing contribution. Monitoring of global trends (primarily bio-

logical, but including social indicators such as per capita income, population growth, and so forth) has become popular, though its actual use in decision-making is unclear. GIS technology is now being applied at realm and global scales, and has been useful in the allocation of resources (particularly during emergencies such as drought). In a limited way, it is the work of anthropologists, geographers, economists, sociologists, and others that documented the need to link protected area management and the sustainability of local peoples, leading to a new paradigm of protected area management and directly contributing to the theme of this Congress.

### THE POTENTIAL OF PARTNERSHIP

While my assessment of the current partnership of protected area management and social science has been somewhat harsh, the potential contributions of usable knowledge give cause for enthusiasm. The social sciences can provide usable knowledge, if properly focused and organized. Protected area managers can integrate such information into their decision-making, if properly prepared. And such a partnership can enhance the role of protected areas in sustaining society.

From a systems perspective, the most valuable contribution of the social sciences may be classified as *feedback* and *prediction*. The major uses of these by protected area managers in decision-making are for *assessment* and *mitigation*. Feedback, prediction, assessment, and mitigation form the core of partnership across the scales of protected area management.

At all scales, the social sciences can and should focus on developing feedback mechanisms for managers. Visitor surveys, monitoring of resident population resource needs, and reporting of socio-economic trends are examples of important feedback activity. The requirements of usable

knowledge demand that such feedback be timely, deal with trends important to managers, and have clear and scientific integrity. Social scientists must therefore focus on adapting all aspects of their research techniques to the practical needs of managers, from study design to the final reporting of results.

The role and importance of prediction in science cannot be overstated. Prediction is the essence of the scientific method, and hence good science must attempt and provide prediction. Social scientists working on protected area issues have for too long avoided prediction for the safer realm of description—describing in social science terms what managers often see for themselves. The storehouse of theory and prediction available from the social sciences needs to be opened up to protected area managers. Social scientists need to apply their theories and make specific predictions—about sustainable activities, biodiversity loss, visitor satisfaction, cost and benefit, and a host of other managerial concerns. These predictions should be based on tested theory rather than favored ideologies, and the level of certainty assigned to each prediction must clearly be described. Some predictions will undoubtedly turn out to be in error; such results can be used to improve future predictions. When a protected area manager asks, “What might happen?”, the social sciences must attempt an answer.

If the social sciences provide usable knowledge in the form of feedback and prediction, then protected area managers have a real opportunity to integrate such knowledge into their decision-making. One important arena is assessment. However informal, most protected area managers attempt an assessment of conditions before making decisions, from the siting of new tourist facilities to the regulation of sustenance use. Managers need to build into

their assessments a role for social science information. The more formal their assessment process (which will vary by scale, importance of decision, and other factors) the more formal a role for social science is required. For example, protected area planning should include a significant level of social science information on visitor, resident, and nearby population resource needs, and the planning process should be designed to make this possible.

In addition to using social science in assessment, protected area managers will benefit by employing such expertise in the mitigation of impacts. Protected area management decisions have consequences intended and unintended; a new visitor road opens up an area for poaching, a new regulation leads to conflict between locals and tourists. Armed with the predictions of its partner social science, the protected area manager at all scales can better mitigate effects. Social science can provide, if managers are willing, useful strategies for dealing with the consequences of decisions. Examples include the use of economic incentives, communication techniques, and conflict resolution.

These functions—feedback, prediction, assessment and mitigation—form the core of a successful partnership between social science and protected area management. What institutional change is required to achieve such cooperation?

## CONCLUSION:

### RECOMMENDATIONS FOR AN INVIGORATED PARTNERSHIP

Institutional arrangements have a great influence on how social science and protected area management can and will cooperate. While there are significant differences in the level of partnership throughout the world, and at the different scales of park management, some general

actions can be proposed for Congress participants to consider.

*At each scale of protected area management, monitoring programs should be established.* Some programs exist: many protected areas keep track of the number of visitors, and the World Conservation Monitoring Centre's Protected Areas Data Unit represents an important effort at the global level. Yet systematic monitoring of socio-economic trends is currently not available. Social scientists should develop these programs, and managers should be involved in determining what data are collected. Feedback to managers should be continuous and in easy-to-use form. Data collected at one level should, as much as is possible, be aggregated at the next. For example, national-level data can be combined to form indicators of realm-wide conditions. A major global assessment of key socio-economic trends should be produced prior to each World Congress, beginning in 2001.

*An international network of Cooperative Protected Area Studies Units (CPASUs) should be established.* These research stations should be located (whenever possible) at universities and funded by protected area agencies, and employ a mix of university and agency scientists. Such units are a viable and efficient way of producing usable knowledge in both the social and biological sciences. First institutionalized in the Pacific Northwest Region of the U.S. National Park Service, CPASUs can and should be adapted to the particular needs of each region, country, and realm. To staff such units, a generation of young, home-country social scientists must be nurtured and encouraged to apply their skills to protected area management. A network of such research stations can play a major role in the monitoring described above.

*Social science research programs must be integrated into natural science research programs.* One of the barriers

to the full use of social science by protected area managers has been that social science has most often been treated separately from the biological sciences in funding, staffing, and organizational structures. Since the problems faced by protected area managers are interdisciplinary, this artificial separation has led to a host of problems: lack of cooperation between biological and social scientists, inadequate and undependable funding for social science, excessive administration, lower standards of scientific rigor, and, most importantly, reduced usable knowledge for managers. While integration of the sciences will not solve all these problems, it is a necessary precursor to significant improvement. The U.S. National Park Service research program could lead by example, and merge its social and natural science programs into a coherent, cost-effective, and interdisciplinary effort.

*The existing bureaucracy must be creatively used to encourage the production and use of usable knowledge.* In many cases, existing regulations and policies have the potential to encourage and increase the amount of usable knowledge produced and used. For example, much of current social science is conducted under contracts or formal agreements between researchers and the protected area agency or organization. Such contracts can, if carefully prepared, increase usable knowledge by requir-

ing manager involvement in study design, stipulating the need and format for usable results, and including as necessary products training workshops for managers on how to use the research in decision-making. Likewise, current supervisory systems can be revised to create incentives for managers to integrate social science into their decision-making, either by requiring formal assessments, evaluating managers on their use of social science in relevant decision-making, or significantly increasing relevant training.

Other recommendations are certainly appropriate, and these can be improved upon. Finally, note that I have *not* made the generic and expected recommendation that funding for social science be dramatically increased; a long-term strategy for partnership suggests that increased efficiency and clear demonstration of the ability to produce usable knowledge are the first steps toward that worthy goal. If the social sciences can meet their obligations toward this partnership, I believe that protected area managers, from local district ranger to park superintendent to national chief to the IUCN leadership, will do likewise. For these managers, represented by the participants at this Congress, well understand that the management of protected areas in the 21st century, now so close, is necessarily the management of people.