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Amitrajeet A. Batabyal

Utah State University

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by

AMITRAJEET A. BATABYAL

Department of Economics
Utah State University
3530 Old Main Hill
Logan, UT 84322-3530

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Amitrajeet A. Batabyal, Associate Professor

Department of Economics
Utah State University
3530 Old Main Hill
Logan, UT 84322-3530

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ABSTRACT

This paper discusses three important resource issues in the American West. These issues relate to (i) land use over time, in the face of potential irreversibilities and new information acquisition by land managers; (ii) mechanisms for appropriately addressing questions of wilderness designation and habitat preservation; and (iii) the design of apposite management institutions.
I. Introduction

The systematic use of natural resources has been a part of life in the western part of the United States for well over two hundred years. Grazing, mining, and ranching have all been important parts of the economies of the states in this region. With use has come federal and state involvement; this involvement has been primarily regulatory in nature. Further, the nature of this regulatory relationship between the regulating and the regulated party has changed considerably over time. Increased public expertise of resource management issues, dissatisfaction with governmental resource management policies, and new attitudes toward conservation have all combined dramatically to alter the character of this regulatory relationship (Cawley 1993).

In the American West, the most visible manifestation of this altered relationship has been conflict. There is conflict over federal management of public lands (Davis 1997), there is conflict over the extent of wilderness designation and habitat preservation (Allin 1997), there is conflict over the desirability of saving endangered species (Mortensen 1994), and there is conflict over the need for multiple-use management of public forest lands (Blumm 1994). Although this fractious environment has stirred the passions of many of the participants in western environmental economic affairs, the same environment has provided a number of interesting research questions for natural resource and environmental economists.

1Dr. Batabyal’s research interests include environmental economics, natural resource economics, development economics, and the interface of economics with ecology, philosophy, and political science. He has published over 130 books, book chapters, journal articles, and book reviews in these areas. His e-mail address is <batabyal@b202.usu.edu> and his home page is located at <http://cc.USU.EDU/~batabyal/index.html>.
Three of the most important resource issues in the American West concern (i) land use over time, in the face of potential irreversibilities and new information acquisition by land managers, (ii) mechanisms for appropriately addressing questions of wilderness designation and habitat preservation, and (iii) the design of apposite resource management institutions.

The purpose of this paper is to discuss these three issues and to suggest some ways in which the questions raised by these issues might be studied. Wilderness management problems in the Wasatch Mountain range (White 1994; Pope and Jones 1990), habitat preservation issues in the Pacific Northwest (Johnston and Krupin 1991), and the "sagebrush rebellion" (Cawley 1993) remind us that a thorough understanding of the questions raised by these three issues is vital to the optimal and, presumably, less fractious use and management of natural resources in the American West.

II. Three Resource Issues in the American West

New analyses of the first issue are needed to shed light on what Marion Clawson (1983, p. 2) has called the major policy issues in federal land management. Specific questions that deserve further research attention include the extent and the nature of development on federal lands, the terms on which federal land should be made available to the states and to other interested parties, and the implications of alternate intertemporal land-use policies.

In particular, when studying land use over time and under uncertainty, it is important to recognize that certain kinds of land uses may be irreversible. To see this, consider the decision problem faced by a land management agency, such as the United States Bureau of Land Management (BLM). The BLM's decision problem is to determine whether a particular unit of land should be developed for mining or preserved. If we think of mining as an irreversible kind of land use, then
it follows that there is an asymmetry associated with the decision to develop land. A decision to develop now means that the decision to develop later has been forsaken. As contrasted to this, a decision to preserve now has a flexibility premium associated with it because the BLM can always develop the land later.

The second issue concerns wilderness designation and habitat preservation. In the past, this issue has generally been viewed in black and white terms. On the one hand, there are those who have “used wilderness as the unifying theme for a new conservation agenda . . .” (Cawley 1993, p. 43), whereas on the other hand there are those who have viewed wilderness as an “all-purpose tool for stopping economic activity” (Tucker 1982, p. 131). As a result, a considerable amount of research is needed to study this issue comprehensively. In this context, game theoretic approaches to wilderness issues are particularly relevant. A key goal of these approaches should be to characterize and study the properties of equilibrium strategies that are pursued by the relevant parties, under alternate assumptions about the information that is available to these parties.

The third issue involves the design of optimal resource management institutions. As Clawson (1983, p. 3) has noted, in the West, the “relationship . . . between the federal, state, and local governments in the management of [natural resources] . . .” has been a matter of continuing interest. Consequently, research in this area is needed to better our understanding of the complexities of decision making between the various governmental entities, particularly the efficacy of parallel versus hierarchical organizational structures. In this context, it should be noted that the parallel versus hierarchical distinction is useful not only from the perspective of regulatory agencies, but from the point of view of interest groups as well. As Cawley (1993, p. 22) has noted, hierarchical governing structures have been used by western stock growers to promote their interests.
The methods and techniques of game and stochastic control theory can be used to formally model and thereby rigorously study these three issues. The application of these methods and techniques to study the issues of this paper is still in its infancy. Consequently, research that uses these methods will accomplish at least two objectives and thereby contribute substantially to the natural resource and environmental economics literature. First, the results of this research can be used to better understand the complex use and management issues relating to public lands, wilderness designation and habitat preservation, and alternate regulatory regimes. Second, the general methods and the research results can be used to improve our understanding of natural resource use and management issues in developing countries. Because sustainable development policies are, in a large part, a function of sustainable natural resource use policies—see Batabyal (1995), Lele (1991), and Pezzey (1989)—it is important to apply and, when necessary, modify insights gleaned from a systematic study of resource use and management in the United States.

Having said this, I should note that the research methods whose use I have advocated do have their limitations. *Inter alia,* this is because of the difficulties associated with the modeling of several sources of uncertainty. Moreover, analyses of the issues of this paper are complicated by the fact that (i) the objectives of the various players are often not known by all the players, and (ii) the presence of multiple regulatory agencies. For instance, in the United States Interior Department alone there are five agencies with substantial mining responsibilities. These include the BLM, the Bureau of Mines, the Minerals Management Service, the Office of Surface Mining and Reclamation, and the U.S. Geological Service. Given this state of affairs, it is difficult for any one modeling technique to successfully account for all the tradeoffs that arise in the interactions between multiple regulatory and regulated parties.
III. Conclusions

The issues that I have discussed in this paper are central to the optimal use and management of natural resources in the American West. Given the increased national concern about sustainable use of the West’s natural resources and the legislative battles over the appropriate use of such resources, it is now more important than ever before to understand and manage the American West’s natural resources effectively. Such action will ensure that an important part of the national economy continues to remain healthy now and in the foreseeable future.
Endnotes

For a more detailed discussion of the issues of this paper, the reader should consult “On Land Use, Wilderness Designation, and Resource Regulation in the American West” by A. A. Batabyal. This paper is forthcoming in Resources Policy. Copies of this paper can be obtained by contacting the Economics Department at Utah State University, Logan, UT 84322-3530 USA (telephone: 435.797.2310), and asking for Economic Research Institute Study Paper #95-21. The author acknowledges financial support from the Faculty Research Grant program at Utah State University, and from the Utah Agricultural Experiment Station, Utah State University, Logan, UT 84322-4810, USA. The usual disclaimer applies.
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