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FUTURE FOR WILDERNESS MANAGEMENT RESEARCH PROGRAMS FOR THE USDA FOREST SERVICE¹

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ABSTRACT.--The Forest Service, U.S. Department of Agriculture, has one research unit devoted to wilderness management research. The unit, created in 1967, has conducted research throughout the nation primarily on recreational aspects of wilderness management. Most research over the past 5 years has focused on improved application of the "Limits of Acceptable Change" planning framework and on education of wilderness visitors--both what users should be told and how to communicate with them. Plans call for continued research on the development of indicators and monitoring methods. Research will also evaluate management techniques, investigate factors that influence both the quality of visitor experiences and user impact levels, and attempt to identify trends in visitor behavior and preferences as well as in resource conditions. Several changes that could improve the outlook for wilderness research programs are noted.

INTRODUCTION

The Forest Service has provided leadership to the field of wilderness management research for the past three decades. In the early 1960's, most wilderness research was conducted by the Pacific Northwest Forest and Range Experiment Station and the North Central Experiment Station (then called Lake States) (Lucas 1987a). Since 1967, most research has been conducted by the Intermountain Research Station through the Wilderness Management Research Unit in Missoula, MT. The mission of this unit is to conduct research to promote better management of wilderness and related lands nationwide. Toward that end, this unit has both conducted in-house studies and supported cooperative studies with universities and other institutions. The results of these studies are reported in almost 200 publications.

Financial support for the Wilderness Management Research Unit is greater now than it was two decades ago. The increase has not been steady,

however; it has not kept pace with the tremendous increase in wilderness acreage that has occurred recently, and current budgets are substantially below what they were in the late 1970's in real dollars (fig. 1). The financial outlook for the unit is uncertain. My prediction is that support will change little in the short-term and improve in the long-term, but that merely reflects an optimistic belief that the great need for support that exists will eventually be recognized. This paper will deal primarily with future research directions of the Wilderness Management Research Unit and my ideas about what is needed to improve the outlook for wilderness research both inside and outside of the Forest Service.

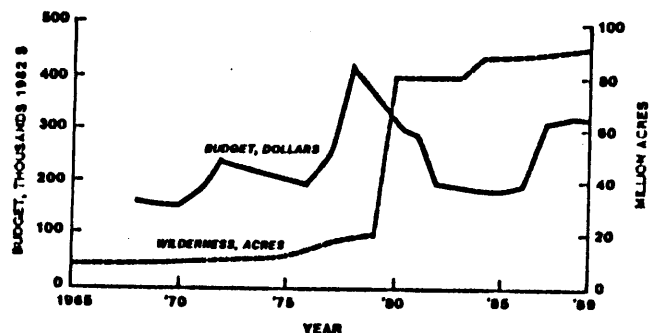


FIGURE 1.--Changes in wilderness acreage and in the Wilderness Management Research Unit's annual budget, adjusted for inflation.

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PAST AND PRESENT RESEARCH

Before turning to the future, I'd like to briefly describe the foundation laid by past wilderness research. Much of the early research of the unit revolved around three general subjects. First was the development of monitoring methodologies--means of measuring amount of use and the condition of campsites and trails (Lucas et al. 1971, Cole 1983). Second was a description of wilderness visitors--their characteristics, attitudes, and preferences, as well as characteristics of the trips that they took and how they distributed themselves in the wilderness (Lucas 1980). A third subject was frequently called "carrying capacity" studies when applied to social research and "impact" studies when applied to ecological research. In each case the aim was to understand the nature of problems and the importance of factors that influence problem severity. In the case of social research, the problem was visitor experiences that were not as satisfactory as possible, and the influential factors most frequently studied were numbers, types, and locations of encounters with other groups (Stankey 1980). A number of ecological impact problems were documented, from campsite, trail, and packstock impacts to problems with human waste disposal. Campsites were the major focus of research, and the most frequently studied factors were amount and location of use (Cole 1982).

During the last 5-year research charter, the research emphasis shifted to focus on wilderness visitor education and implementation of the Limits of Acceptable Change (LAC) planning framework. Social research attempted to understand the audiences for educational messages and to evaluate the effectiveness of established educational programs. The goal of the ecological component of the program was to evaluate and improve the content of low-impact educational messages (Cole 1989). In addition, considerable effort went into taking the concept of LAC, first articulated by Frissell and Stankey (1972), and developing it into a framework for wilderness planning. This effort has consisted of developing a "how-to" manual (Stankey et al. 1985), assisting in its application in the Bob Marshall Wilderness Complex (McCool 1986), and putting on training sessions for managers. The final general area of interest was in identifying trends--in amount of wilderness use (Lucas and McCool 1988), in characteristics and preferences of wilderness visitors (Lucas 1985), and in the condition of wilderness campsites (Cole 1986).

FUTURE RESEARCH EMPHASIS

The research unit is currently adopting a new 5-year charter. The timing for this is fortuitous following Robert C. Lucas' retirement and George H. Stankey's move to academia. Those two had been the core of the unit for most of its existence. In developing new direction we consulted several sources that contained explicit statements of critical research gaps (Frome 1985, Lucas 1987b) and solicited the comments of many

agency personnel and academics. The response was overwhelming in its diversity and in its advice both to continue down the track the unit has established and to break new ground. Our new charter is an attempt to meet these needs, while also recognizing the limitations of a small research unit.

The wording of our mission has been changed slightly. Instead of studying wilderness recreation, the mission will be to study wilderness management issues, with emphasis on recreation use and its impacts. This subtle shift is intended to leave the door open to pursuing important nonrecreational issues. Research is needed on nonrecreational values, the impacts of nonrecreational activities and problems with compromised nonrecreational values. With only two full-time scientists we will still emphasize recreation issues because they remain highly important and because that will allow us to continue to build on the foundation the unit has already built. Where possible, however, we would like to be able to support and encourage wilderness research on issues beyond the scope of recreation. We will continue to work nationwide and to attempt to support wilderness management in agencies other than the Forest Service.

The first of three major research problem areas draws heavily on the tradition of the carrying capacity and ecological impact studies of the 1970's and early 1980's. The problem to be attacked is that information is needed about the factors that influence the quality of both the wilderness resource and recreational experiences and how these qualities are changing over time. Emphasis will be on defining the nature of problems that have not been studied sufficiently, such as conflict between user groups, social impact problems other than too many encounters, the impacts of recreational packstock, and impacts on animal populations. For some of the problems of most importance, research will also attempt to understand how important independent variables, such as amount or type of use, influence problem severity. This should eventually provide managers with the information they need to manipulate these independent variables to exert more control on the quality of both wilderness conditions and experiences. For example, research using experimental trampling and camping should help identify the use levels where either use dispersal or use concentration is appropriate and also contribute to the content of low-impact educational messages.

Related to this research effort will be repeat surveys of visitors and of ecological impact conditions in a few representative wildernesses around the country. This work will add perspective to the nature of problems by indicating how they are changing over time. Wilderness visitor use data indicate that current visitation is lower than it was a decade ago. This has led some to suggest that problems may also be declining and that management could shift away from restriction to focus more on providing quality experiences (Lucas and McCool 1988, Roggenbuck 1988). Better information on trends

will allow us to evaluate the merit of this suggestion. The repeat surveys of visitors--to date there has been only one (Lucas 1985)--will also suggest how users and their wilderness visits are changing. This knowledge is critical to many management efforts, from understanding visitor preferences for management to knowing where and how to contact visitors.

The second problem area is that current knowledge about alternative wilderness management techniques, particularly in places that receive concentrated use, is inadequate. Numerous experiments in wilderness management are constantly being tried; the problem is that their success is seldom rigorously evaluated. Consequently, there are few opportunities to learn from mistakes or to perfect techniques that are moderately successful. This research will attempt to identify management experiments worthy of evaluation and to monitor their success. Use limitation and visitor education programs are examples of the types of programs we would like to evaluate. In some cases we may establish demonstration projects in popular destination areas to try new management approaches and evaluate success. Research will also involve experimenting with a variety of alternative methods to determine which are most successful. For example, we intend to conduct research on the effectiveness of alternative means of revegetating campsites.

The third problem area is that managers lack the scientific basis for identifying appropriate indicators and standards for wilderness conditions and for developing cost-effective monitoring procedures. This research will build on the foundation of earlier work on the LAC concept and the development of monitoring methods. Campsite conditions, amount of recreation use, and the number of encounters between visitor groups have already been identified as important indicators of wilderness condition. Monitoring techniques for each of these indicators exist, but not all problems have been resolved. Further research is needed to alleviate problems and to make techniques as cost-effective as possible.

For the LAC concept to be most useful, managers must be able to identify indicators of the most important conditions in wilderness. Their ability to do that is currently limited by a lack of technical knowledge about appropriate indicators. Indicators of campsite condition and crowding have been developed, largely on the basis of the early carrying capacity and impact research of the Wilderness Management Research Unit. But indicators need to be developed for other conditions, such as animal populations and water quality, and for characteristics--other than number of encounters--that influence experiential quality. Research will also attempt to identify the acceptability of differing conditions to visitors. This will provide useful input for the development of standards.

The Research Unit will also be providing support to a special Congressionally mandated study of the impact of aircraft overflights on visitors and natural and cultural resources in

Forest Service wilderness and selected National Parks. Research will provide insights into the effects of the acoustic environment on wilderness resources and information on wilderness visitor safety.

These, then, are the general directions our research program will go in the next 5 years. Our in-house staff will obviously have to concentrate on just a few of these research topics. It is frustrating to be unable to tackle all the issues that need research. In particular, we regret being unable to take on many of the basic ecological questions that confront wilderness managers. But we will continue to function as a source of seed money so that work can get started on as broad a range of topics as possible.

CONCLUSIONS

While I remain excited and optimistic about Forest Service research on wilderness management, it is clear that the resources currently available for this research are inadequate to meet knowledge needs. A number of potential changes could contribute to a more vigorous and effective wilderness management research program. First, more resources within the Forest Service could be allocated to wilderness management. I am encouraged by the fact that the Southeastern Forest Experiment Station is going to be conducting research in wilderness. Their research emphasis will be on nonrecreational issues, an important addition to the recreation focus of our unit. The Pacific Southwest Forest and Range Experiment Station is also conducting some research on wilderness visitors in an attempt to understand problems inherent to managing recreation at the urban/wildland interface. Second, the other agencies that manage wilderness--the National Park Service, Bureau of Land Management, and Fish and Wildlife Service--could contribute to wilderness research. The National Park Service and Fish and Wildlife Service have established research programs. These could be broadened to provide needed knowledge on the range of issues wilderness managers face.

Beyond the Federal land-managing agencies, the private sector could contribute substantially to research on wilderness management. For example, in recent years I have worked with the National Outdoor Leadership School to produce educational materials on low-impact wilderness use. So far, we have developed a pamphlet and a book (Hampton and Cole 1988) and a video is in the planning stages. The school has allocated funds to create a research department that will devote much of its energies to wilderness management issues. Other private groups, such as the Appalachian Mountain Club and the Wilderness Research Center, also support wilderness research.

Another change that--if it occurred--would promote a stronger research program is the development of a constituency that demands professional wilderness management. Every other resource has such a "watchdog" group. For example, although their definitions of quality and

professionalism differ greatly, both the timber industry and environmental groups demand quality and professional management of timber resources. Wilderness management and research would also benefit from the development of groups that advocate professional management.

Finally, the outlook for wilderness research will probably brighten as more attention is paid to the nonrecreational values of wilderness and the challenges to managing for those values. With time, wilderness will become increasingly valued as the primary place to study unfettered natural processes and the principal source of biodiversity. As these values increase in the eyes of the public, and as challenges to the integrity of wilderness ecosystems increase, support for wilderness management research is likely to increase.

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