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# RENEWABLE RESOURCE INVENTORIES FOR MONITORING CHANGES AND TRENDS

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# MONITORING AND EVALUATING CHANGES AND TRENDS IN RECREATION OPPORTUNITY SUPPLY

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ABSTRACT--The recreation opportunity spectrum (ROS) offers a framework for monitoring changes in recreation opportunity supply. It uses measurable criteria and standards to define recreation opportunity settings. The ROS is mainly used as an inventory tool; its use for monitoring has not been fully developed. Monitoring of trends, however, is fundamental to effective planning and management. A useful monitoring system requires clear definition of variables, systematic collection, replicable and cost-effective procedures, and sensitivity to changes. Monitoring provides feedback on conditions, changes in conditions, management effectiveness, and the effects of allocation decisions. Monitoring demonstrates how decisions regarding recreation and other resources alter the type and amount of recreation opportunity supply.

KEYWORDS--Recreation planning, recreation management, integrated resource management.

## INTRODUCTION

Because of the risk and uncertainty characterizing natural resource decisions, and growing concerns regarding effective and efficient performance, increased attention has been devoted to monitoring and evaluation. Monitoring, as defined by Webster, is "to watch, observe or check especially for a special purpose." Evaluation, on the other hand, involves "an examination and judging concerning the worth, quality, significance, amount, degree or condition of something" (Schwarz et al. 1976).

Recreation has always posed problems to managers and planners. Demand and supply are difficult to measure (Driver and Rosenthal 1982). Although most agree that the output of recreation management are the recreational opportunities used by participants, past measurement has not recognized this. Consequently, much attention has focused on other factors. Demand, for example, is commonly estimated by participation levels. Although important, such figures do have shortcomings. First, they are influenced by existing and known opportunities. Second, they yield limited information on clientele changes and shifts in benefit recipients. Third, they reveal little regarding the quality of the experiences participants gain. Finally, they do not identify the variability in the style in which different activities can be pursued (e.g., the various types of fishing). Failure to describe this variation limits the value of such data for estimating supply needs, given the differing resource requirements of the styles.

Similarly, our ability to define and measure recreation opportunities is poor. Subtle shifts in recreation settings can go undetected (Clark and Stankey 1979). Such shifts are driven by management actions (or inactions), changes in users, alterations in adjacent land uses, etc. In sum, the nature and distribution of recreation opportunity settings is altered, without recognition or appreciation of its significance. The experience outputs also change. As the nature of the settings change, clientele also shift. New participants are attracted to the altered setting and former participants are repelled. This sociological equivalent of "succession-and-displacement" has been identified as a concern for recreation managers (Clark et al. 1971).

These problems have implications for those concerned with recreation management. Without a clear idea of what defines recreational opportunity settings, subtle, incremental changes can occur, distorting the desired mix of settings. This can lead to disenfranchised clientele, irreversible loss of opportunities, and increased inefficiency in service delivery. The inability to define recreation opportunity settings rigorously hampers the capacity to follow and evaluate the magnitude and importance of changes.

The Recreation Opportunity Spectrum (ROS) offers a framework for dealing with many of these problems (Brown et al. 1978; Clark and Stankey 1979; Buist and Hoots 1982). Basic to this concept is the recreation opportunity setting, defined as "the combination of physical, biological, social, and managerial conditions that give value to a place" (Clark and Stankey 1979).

The ROS system focuses on the setting, yet it recognizes that the setting is only a medium through which human experiences are produced. The linkage between the settings offered, the activities in which people engage, and the experiences produced is probabilistic. By varying the combination of physical-biological, social, and managerial conditions, managers can offer different types and styles of recreational activities to achieve different experiences. By establishing measurable criteria for different settings, the ROS enables decisionmakers to measure and identify changes in supply.

## PHASES OF ROS PLANNING

In using the ROS for monitoring and evaluation, five phases can be described (Brown 1979; Stankey and Brown 1981). Each phase produces essential information for understanding the nature and distribution of recreation opportunities and the relationship between recreation and other land uses.

### Phase I

Phase I is concerned with definition and description of settings and with an accurate measure of current supply and demand. A map of existing recreational opportunity settings is produced, and information regarding existing and potential use is collected. Phase I produces an estimate of what is happening at present.

### Phase II

Phase II identifies what can be. Given resource capability, organizational constraints, demand data, etc., suitable alternatives are defined. Depending upon considerations such as managerial and financial constraints, what can be might be similar to, or differ markedly from, what is.

### Phase III

Phase III involves selection of the preferred recreation alternative, or what should be. This is an allocative decision regarding the appropriate mix of recreation opportunity settings as well as a decision regarding the prescriptions to guide management of these opportunities. It reflects an analysis of public values and needs, supply and demand data, etc. This phase involves a maximization of the recreation outputs from the area.

### Phase IV

In Phase IV, the selected recreation alternative is analyzed along with other resource management alternatives to produce an optimum, integrated management program. Depending upon other resource values and trade-offs, the recommended recreation alternative identified in Phase III might be retained wholly or partially. Phase IV decides what will be; i.e., integrated management objectives. From these objectives, criteria and standards for all resource management actions can be derived. The criteria and standards guide subsequent monitoring and evaluation.

### Phase V

Phase V calls for a monitoring and evaluation program to evaluate the attainment of management objectives. Information collected in Phase V concerns what is happening, why, and what, if anything, should be done.

Phase V contains two components: monitoring—the orderly collection of data, and evaluation—the analysis and interpretation of the data, comparing actual effects with hypothesized or intended effects. When actual effects differ from those desired, action is called for, ranging from implementation of different management actions to revision of management objectives.

## RECREATION MONITORING

Monitoring involves observation of phenomena and systematic collection of data for the purpose of evaluating attainment of area management objectives. The three key elements of this definition are the notions of "observation . . . and systematic collection," "purpose," and "evaluating." Systematic means that the data are collected according to a predefined and replicable process. Purpose means there is a predetermined objective for the data. Monitoring is not to be pursued in an intuitive and convenient fashion. To do so greatly limits objective evaluation of plan performance, the third element.

The functions of monitoring include:

1. Provides feedback on conditions—Monitoring provides an updated inventory allowing managers to assess the current situation at any time.

2. Identifies changes in conditions—Monitoring alerts managers to biophysical or social changes differing from those sought in the management plan.

3. Provides feedback on management effectiveness—Typically, management prescriptions will be instituted under conditions where their effects are not fully known. Monitoring provides feedback on the actual effects of decisions, permitting modifications or the implementation of new actions.

4. Provides feedback on effect of allocation decisions—The effects of different allocation decisions on recreation, and vice versa, are often poorly understood. Monitoring clarifies the relationship and effects of such decisions, and helps identify possible alternative allocations and/or management actions.

To achieve these functions, the following are important:

1. Clear variable definition—Variables for which data are collected must be unambiguously defined, and must include specific units of analysis.

2. Systematic collection procedure—Monitoring must be systematic. The procedures and rules for both what and when data are collected must be explicit, particularly when judgments are called for.

3. Replicable procedures—The process used to collect data must be subject to independent replication.

4. Cost efficient—The monitoring system should collect only data whose benefits exceed costs. Costs are usually easy to express in monetary terms. Benefits are less easily identified and measured; however, even though difficult, such judgments need to be made.

5. Cost effective—The monitoring must be relevant to the decisions facing managers. A guideline here is: if the data were available, how would they be used in evaluating progress toward area management objectives?

6. Sensitive to changes in the resource system that affect recreation opportunities—Major influences on recreation opportunity settings often stem from changes in adjacent areas managed for nonrecreation values (Clark 1982). Alterations in access or shifts in land use can have profound effects on recreation. The monitoring system must be sensitive to these changes and their effects on recreation.

## MONITORING AND EVALUATION

Monitoring is a necessary but insufficient activity for performance assessment. An evaluative framework in which to interpret data must also be developed.

Monitoring provides feedback on three matters of concern: (1) the performance of the basic allocation decision (macro-scale performance); (2) the performance of management prescriptions (micro-scale performance); and (3) the consequences of unanticipated events, including those within as well as outside management control. In this latter case, examples might be land use changes or introduction of new technology.

To evaluate data collected during monitoring, a framework using criteria and standards can be developed. Issues a framework should address include relative availability, substitutability, or manageability (Stankey 1977).

These concerns, along with others managers might pose, aid evaluating data on changes identified during monitoring. Through analysis, the costs and benefits of actual or anticipated changes can be identified and effective responses proposed.

## THE ROS AND MONITORING

The ROS establishes measurable criteria for different opportunities and outlines appropriate recreational activities and management actions for different opportunities. It facilitates the analysis of changes by providing a standard against which change can be evaluated.

Use of the ROS to monitor changes would involve the following:

1. The definition of what constitutes appropriate and acceptable conditions for the physical-biological, social, and managerial settings is expressed specifically.

2. Monitoring is conducted to provide managers with information on the trends and changes in these specific conditions (for example, access to the area or the levels of contact among recreationists).

3. The monitored conditions are compared to those in the standards. The relationship between the two provides the basis for managers to evaluate the situation and to recommend changes in prescription needed to achieve objectives.

The standards for each ROS class provide a basis for identifying if current trends jeopardize the desired pattern of recreational opportunities. Monitoring might reveal that shifts in adjacent land uses and access have led to increased recreation use. When compared to the conditions appropriate for the recreation opportunity setting, managers conclude that these changes threaten the desired mix of recreational opportunities.

## CONCLUSIONS

Mandates to conduct monitoring and evaluation in the National Environmental Policy Act and the National Forest Management Act Regulations, coupled with the need to be more effective and efficient, necessitate an orderly approach. To date, monitoring and evaluation has received more rhetoric than it has substantive discussion; consequently, the record of performance is spotty.

Monitoring provides management with the data needed to rationally evaluate program performance. Without a framework to guide this assessment, personal opinion and bias can dominate. While the ROS provides such a framework, its use requires clear statements of the assumptions and rationale behind the process (Clark 1982). Data from a monitoring process linked to the ROS will clarify understanding of the complex relationships between recreation and other resource uses.

## REFERENCES CITED

Brown, P. J. 1979. The opportunity spectrum: techniques and implications for resource planning and coordination. Pages 82-87 in Dispersed recreation and natural resource management (J. Shaw, ed.). College of Natural Resources, Utah State University, Logan.

Brown, P. J., B. L. Driver, and C. McConnell. 1978. The opportunity spectrum concept and resource supply inventories: background and application. Pages 73-84 in Integrated inventories of renewable natural resources: proceedings of the workshop. U.S. Forest Service, Fort Collins, Colorado. General Technical Report RM-55.

Buist, L. J., and T. A. Hoots. 1982. Recreation opportunity spectrum approach to resource planning. Journal of Forestry 80:84-86.

Clark, R. N. 1982. Promises and pitfalls of the ROS in resource management. Australian Parks and Recreation, May: 9-13.

Clark, R. N., J. C. Hendee, and F. L. Campbell. 1971. Values, behavior, and conflict in modern camping culture. Journal of Leisure Research 3:143-159.

Clark, R. N., and G. H. Stankey. 1979. The recreation opportunity spectrum: a framework for planning, management, and research. U.S. Forest Service, Portland, Oregon. General Technical Report PNW-98. 32 p.

Driver, B. L., and P. J. Brown. 1978. The opportunity spectrum concept and behavior information in outdoor recreation resource supply inventories: a rationale. Pages 24-31 in Integrated inventories of renewable natural resources: proceedings of the workshop. U.S. Forest Service, Fort Collins, Colorado. General Technical Report RM-55.

Driver, B. L., and D. H. Rosenthal. 1982. Measuring and improving effectiveness of public outdoor recreation programs. George Washington University, Washington, DC. 40 p.

Schwarz, C. F., E. C. Thor, and G. H. Elsner. 1976. Wildland planning glossary. U.S. Forest Service, Berkeley, California. General Technical Report PSW-13.

Stankey, G. H. 1977. Some social concepts for outdoor recreation planning. Pages 154-161 in Outdoor recreation: advances in application of economics. U.S. Forest Service, Washington, D.C. General Technical Report WO-2.

Stankey, G. H., and P. J. Brown. 1981. A technique for recreation planning and management in tomorrow's forests. Pages 63-73 in Proceedings, Division Six, XVII IUFRO World Congress, Kyoto, Japan.