RECREATION OPPORTUNITY SPECTRUM PLANNING
An Arid Land Case

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During the last 15 years recreational use of arid lands has increased tremendously in the western United States. Use ranges from primitive and unconfined forms usually associated with the American Wilderness to more modern and urbanized forms of recreation at resorts and tourist centers. One result has been greater attention to recreation planning and management by arid land resource managers. And, like their counterparts who manage forest land, they have sought techniques that enable better assessment and evaluation of recreation resource capabilities, integration of recreation with other resource uses and management of the resources for recreation.

Arising from this need for better tools for planning and management, and from some advances in recreation research, has been development of a system for recreation resource planning, based on the idea of a recreation opportunity spectrum (3,4). Through task force efforts of the two U. S. agencies managing the most public land, Bureau of Land Management (BLM) and Forest Service (USFS), a system for improving recreation planning has emerged (2). This system, Recreation Opportunity Spectrum (ROS) Planning, is now the standard system used on about 30 percent of the land area of the U. S. (all land managed by the two agencies).

Recreation Opportunity Spectrum Planning

Underlying Recreation Opportunity Spectrum Planning is the idea that quality recreation experiences are best assured by providing a diverse set of recreation opportunities (3). Specifically, it means we might supply different opportunities for people to engage in specific recreation activities in specific recreation environments (or settings) to realize desired recreation experiences (4). Further, the assumption suggests that these different opportunities can be arrayed along a spectrum of opportunities that are defined by using activity, setting, and experience dimensions.

U. S. land management agencies have divided the spectrum into six major sections, each reflecting a different type of opportunity (8). Each type of opportunity is unique according to the activities, settings and experiences that define it.

To enable identification of areas capable of supporting these opportunities, standards that specify appropriate conditions for each ROS class have been developed. For resource management, which primarily deals with manipulation of environmental settings, standards for the physical, social and managerial attributes of the setting are particularly important.

This basic approach to defining recreation opportunities guides implementation of all stages of the ROS planning process. The major activities in the process are:

1. Conducting a demand analysis for Recreation Opportunities (ROs) defined along the ROS.

2. Conducting a supply analysis, which consists of (a) estimating the capability of the planning area to provide for different ROs, and (b) identifying which ROs are currently provided on the planning area.

3. Determining where and how different ROs should be provided in integration with other planning area outputs (e.g., timber).

4. Allocating and managing lands and waters consistent with RO decisions in activity three.

This planning system is not logically different from many others. It deals with integration of supply and demand information to arrive at resource allocations and specifies a consistent set of guidelines for management. Its contributions are that it: (1) requires supply and demand analysis to focus on the same products, recreation opportunities; (2) enables delineation on maps of areas providing different opportunities; (3) provides guidelines for management so that actions can be judged for consistency with opportunities to be provided; and (4) recognizes the multidimensional nature of recreation opportunities. The system has gone through testing in many different environments and has proven applicable under a wide range of conditions. It appears to be suitable for forest, grassland, and desert landscapes and fits all topographic and land ownership conditions.

Implementing the System: An Arid Lands Case of Supply Analysis

Most advancement of the ROS planning system has been made in the area of supply analysis. In this section we present a supply analysis and discuss two technologies available for implementing this phase of ROS planning: hand drawn and computer assisted mapping techniques. We implemented both methods at Steens Mountain Recreation Area, located in southeastern Oregon...a state of contrasts. Western Oregon is a land of dense forests, large trees, and rich agricultural valleys. Eastern Oregon, in contrast, is open grass and desert land in the rain shadow of the Cascade Mountains. Southeastern Oregon is the northern section of the high desert basin and range province which extends south and east through Nevada, Utah, and southern Idaho...a land interspersed with arid mountain ranges and valleys.

The Steens Mountain Recreation Area is managed by the BLM and covers approximately 500 km^2 of very sparsely populated landscape. The nearest community (less than 4000 persons) is about 95 km away. The mountain itself is a fault block characterized by slowly rising terrain on its western slope and an abrupt escarpment on its eastern slope. Its western slope is cut by several large U-shaped valleys, remnants of former glaciation. The moun-

tain rises about 1500 m above the surrounding desert (fig. 1).

With its spectacular scenery, good fishing in streams and lakes, and abundant game and non-game wildlife, Steens Mountain has become a popular recreation area. Major recreational activities are fishing, hiking, camping, off-road vehicle use and hunting.

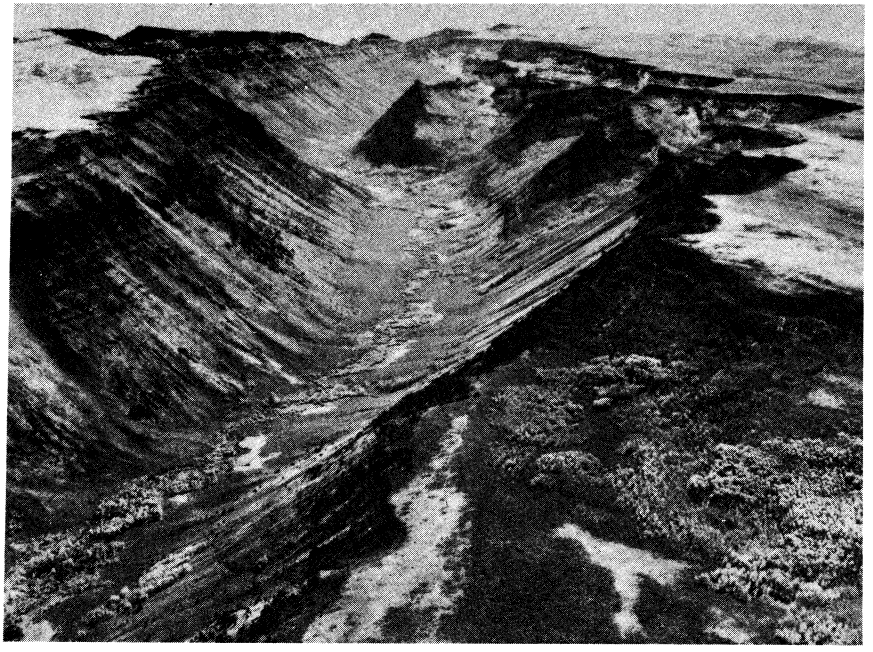

Figure 1. *Looking south up Kiger Gorge in the Steens Mountain Recreation Area, Oregon.*

Identifying Types of Opportunity

Using BLM standards for remoteness from sights and sounds of man, size of area, renewable resource modifications, and social and managerial conditions, the Steens Mountain Recreation Area was zoned to show the types of recreation opportunities which it presently provides (fig. 2). Only three of the standard six types of opportunity are provided on Steens Mountain. The rugged east face of the mountain and some of the western canyons provide semi-primitive non-motorized opportunities (SPNM). Many of the plateaus separating the west side of canyons provide semi-primitive motorized opportunities (SPM), and the area along the loop road on the

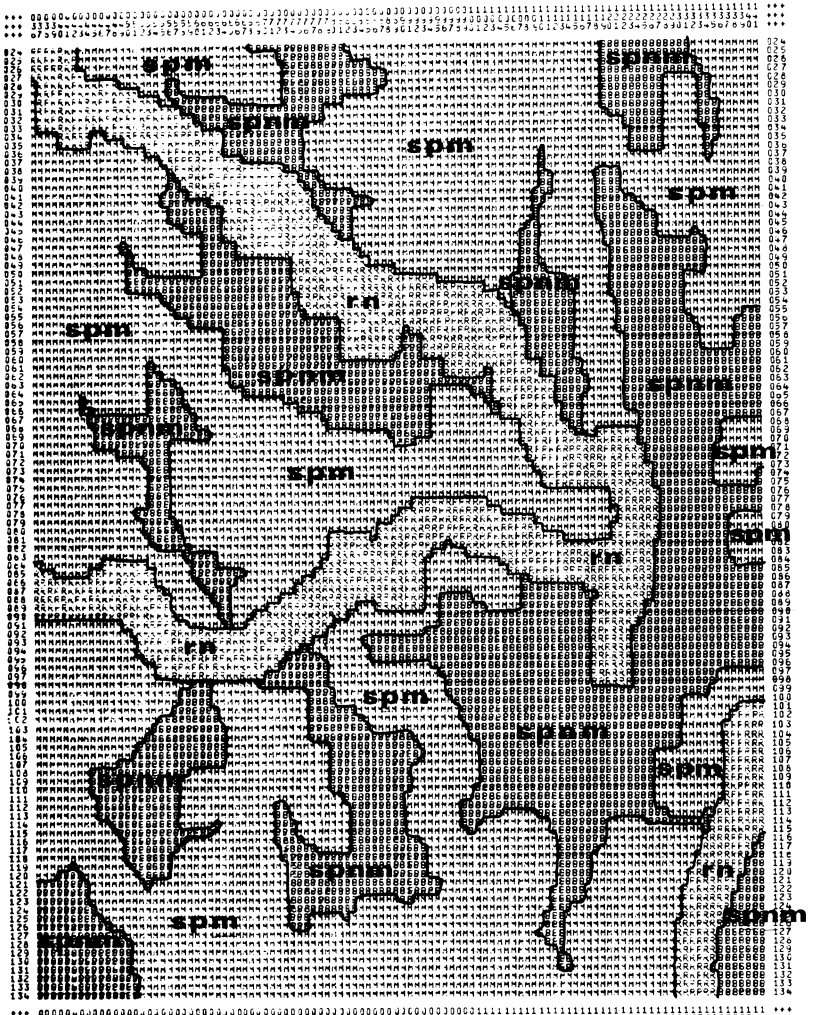

Figure 2. *Semi-primitive non-motorized (SPNM), Semi-primitive motorized (SPM), and Roaded Natural (RN) ROS zones for the Steens Mountain Recreation Area.*

western slope provides a roaded natural opportunity. This last zone contains all of the developed recreation facilities on the mountain.

The recreation opportunity zones shown in figure 2 correspond well to the way managers have treated the area and to the kinds of experiences recreationists indicate they realize from it. The one

exception is that a few canyon areas seem to provide a more primitive opportunity than shown. Because of terrain these areas offer greater solitude from sights and sounds of human activity than is necessary for semi-primitive opportunities. The ROS planning system allows managers flexibility to adjust boundaries between types of opportunity based on their knowledge of what is appropriate.

Hand Drawn and Computer Mapping Comparison

The computer map shown in figure 2 also was drawn by hand, giving us an opportunity to compare the two methods (7). The two methods produced maps of similar area by ROS class as shown in table 1. What is not shown is that significant errors in classification were made in hand drawn mapping. For instance, the semi-primitive non-motorized opportunity adjacent to and north of the roaded natural opportunity shown in figure 2 was completely missed during hand drawn mapping. Such an error could not occur in computer mapping if base data are properly encoded as they were in this comparison exercise. This advantage of computer mapping, however, should be weighed against the problem illustrated in figure 2, namely the difficulty in making judgmental adjustments in classification due to terrain or other variables which are outside of the numerical standards used in computer mapping.

Table 1. *Areas in recreation opportunity types for computer and hand drawn Steens Mountain recreation opportunity maps.*

Type of Opportunity	Hand Drawn Technique		Computer Technique	
	Hectares	Percent	Hectares	Percent
Semi-Primitive Non-Motorized	36,345	34.1	33,285	31.4
Semi-Primitive Motorized	55,577	52.2	56,049	52.8
Roaded Natural	14,528	13.7	16,827	15.8
	106,450	100.	106,161	100.

In comparing hand drawn and computer mapping techniques we also examined time and monetary costs expended on both methods. Our base data had not been digitized, so that was a necessity for computer mapping. We spent approximately six more hours producing the hand drawn map and measuring the area in each ROS class (26 to 20 hours). In contrast, we spent about $130 (US) more on computer mapping ($300 to $170). If our base data had been digitized, computer mapping would have been the superior alterna-

tive. In that case we would have spent about 12 fewer hours and 20 fewer dollars on computer mapping.

Evaluating Management Alternatives

Simply inventorying the current ROs is only one activity in ROS planning. Another activity is to simulate the effects of management activities on recreation opportunities so that we can decide upon the appropriate allocation and management direction for the area. A variety of management actions could be simulated for the Steens Mountain Recreation Area; a look at only one of them will illustrate what is possible. In response to policies requiring off-road vehicle area designations to protect natural resources, BLM proposed closing several primitive roads and travel ways on Steens Mountain. The effect of these road adjustments on recreation opportunities can be seen in figure 3. In most cases, areas formerly in the semi-primitive motorized class are now in the semi-primitive non-motorized class. In two cases some land was reclassified into the roaded natural opportunity class because the distance from main roads standard for the SPNM class was more restrictive than for the semi-primitive motorized class, and in eliminating the semi-primitive motorized opportunity the border areas were joined with the adjacent roaded natural opportunity. The actual changes were an addition of 6500 ha to semi-primitive non-motorized and 1000 ha to roaded natural and a loss of 7500 ha from semi-primitive motorized.

Other road closure scenarios could be simulated and their effect on recreation opportunities judged. Also, other management actions that are responsive to demand could be simulated. For instance, one could determine the effect of new mining activity, changes in cattle grazing, winter snowmobiling, and other resource use activities on recreation opportunities. Conversely, if we wanted to maintain a particular set of recreation opportunities we would be able to know what other resource use opportunities we would be giving up, if they were in conflict with the desired recreation opportunities.

Research

From our experience at Steens Mountain we learned that the fundamental aspects of ROS planning are applicable to arid lands It results in identification of recreation opportunities currently provided and it enables simulation of the effects of possible management actions.These activities are critical to recreation planning, especially where recreation needs to be integrated with other resource uses.

To be able to fully use ROS planning, however, we also need demand information in ROS terms. For most areas, demand information does not exist, or only exists by recreation activities. There are several demand estimation methodologies (5) and recently there

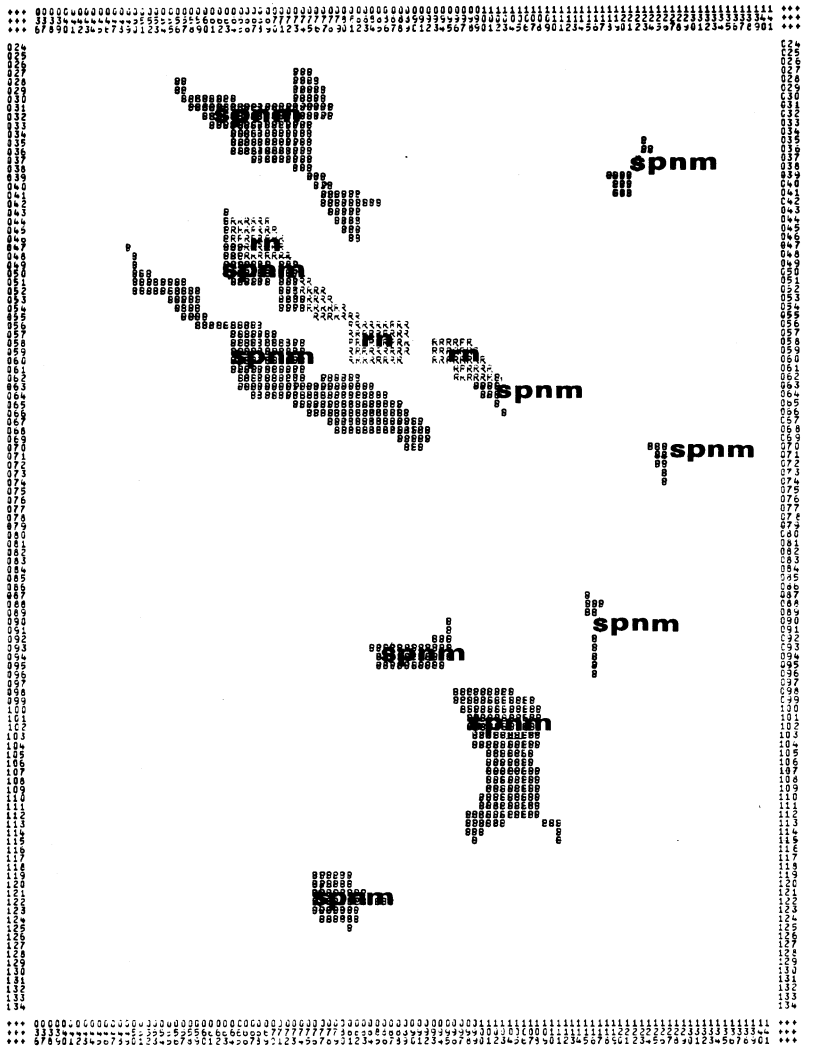

Figure 3. *Areas of modified ROS zones due to road closures for the Steens Mountain Recreation Area.*

has been interest in using these with a focus on recreation opportunities and experiences (6, 9). A study by White (9) was done in the Steens Mountain Recreation Area and shows that measures of value can be generated for recreation opportunities using the various methods noted by King and Davis (5), even though different methodologies produce different magnitudes of value.

Another area of concern in implementing ROS planning is the standards used to map recreation opportunities. It has been suggested that the standards used in arid landscapes might need to be different from those used in forested landscapes (1). This is especially true for the distance from the sights and sounds of man (remoteness) criterion used in delineating ROS types. In view of this concern we have been studying how users of the Steens Mountain Recreation Area perceive the recreation opportunities it provides. Our initial review of their perceptions indicates that the criteria used in arid and forested environments are quite similar. However, we also note that the topography of Steens Mountain is varied and that this variation might provide the same types of screening afforded in forested landscapes. If Steens Mountain were a flat grass or desert land other standards might be appropriate.

Management

The worth of any recreation planning system is whether or not planning decisions are carried out and sound management is obtained. While our work in the Steens Mountain Recreation Area has not progressed to the point where it has met this test of worth, the ROS planning system does contain the ingredients for success. Since it uses standards which indicate the resource, social, and managerial conditions to be achieved by management, it provides the guidance necessary for directing management. Using ROS guidelines, once decision makers select which recreation opportunities are to be provided at each location in the planning area, they can decide on appropriate management tools that will allow management consistent with the chosen objectives. In the case of Steens Mountain, for example, they can choose which roads should be closed to achieve the amount of semi-primitive non-motorized opportunity needed. Additionally, they will have guidelines against which to judge management proposals for water, forage, minerals, wildlife, and recreation outputs. Finally, over time these guidelines can be used to judge the implications of other changes in resource, social, or managerial conditions within the recreation area.

REFERENCES:

(1) Brown, P. J., B. L. Driver and J. K. Berry. 1980. Use of the Recreation Opportunity Planning System to Inventory Recreation Opportunities of Arid Lands. pp 123-128 in Arid Land Resource Inventories: Developing Cost Efficient Methods. USDA Forest Service General Technical Report WO-28. 620 pp.

(2) Buist, L. J. and T. A. Hoots. 1982. Recreation Opportunity Spectrum Approach to Resource Planning. Journal of Forestry 80(2):84-86.

(3) Clark, R. N. and G. H. Stankey. 1979. The Recreation Opportunity Spectrum: A Framework for Planning, Management, and Research. USDA Forest Service General Technical Report PNW-98. 32 pp.

(4) Driver, B. L. and P. J. Brown. 1978. The Opportunity Spectrum Concept and Behavioral Information in Outdoor Recreation Resource Supply Inventories: A Rationale. pp 24-31

in Integrated Inventories of Renewable Natural Resources.USDA Forest Service General Technical Report RM-55. 482pp.

(5) King, D. A. and L. S. Davis. 1980. Recreation Benefits Estimation: A Discussion Summary. Journal of Forestry 78(1):27-28.

(6) King, D. A. and A. W. Walka. 1980. A Market Analysis of Trout Fishing on the Fort Apache Indian Reservation. School of Renewable Natural Resources, The University of Arizona, Tucson, Arizona. 86pp.

(7) Manfredo, M. J. and P. J. Brown. 1980. Use of Recreation Opportunity Planning to Inventory Arid Lands in Eastern Oregon—A Demonstration. pp. 331-337 in Arid Land Resource Inventories: Developing Cost Efficient Methods. USDA Forest Service General Technical Report WO-28. 620pp.

(8) USDA Forest Service. 1981. Recreation Input to Land and Resource Management Planning. FSH1909.12, Land and Resource Management Planning Handbook for National Forests, ch. 500. Washington, DC. 45pp.

(9) White, W. B. 1982. Valuation of Recreation Resources: A Methodological Comparison as Applied to Steens Mountain, Oregon. Unpubl. Doctoral Dissertation, Oregon State University. 133pp.

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