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Recreation Opportunity Spectrum With Implications For Wildlife-Oriented Recreation

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Resource planning has undergone transitions over the years from a site to area to regional orientation and from a single function to integrated resource management orientation. Wildlife and recreation resource planning have been part of this evolution, which has been stimulated somewhat by recent land management planning-oriented legislation such as the National Forest Management Act and the Federal Land Policy and Management Act.

During the last couple of years, a system for recreation planning within the context of integrated resource planning has emerged. It is called Recreation Opportunity Spectrum (ROS) planning and arose as an old idea was made operational through new knowledge from recreation behavior research and through the necessity for designing a system that was integrative with other resource planning systems (e.g., Driver and Brown 1978, Clark and Stankey 1979, Brown 1979, Stankey and Brown 1981).

The idea for a recreation opportunity spectrum has been around for a long time. The notion (though not necessarily the label) occurs in the writings of Marshall (1937), J. V. K. Wagar (1951), Burch (1964), Lucas (1964), and J. A. Wagar (1966) among others. The behavioral research that has led to making the idea operational for planning is more recent. For example, in research leading to ROS concepts, Potter et al. (1973) have studied hunters, Driver and Knopf (1976) have studied fishermen, Schreyer and Nielsen (1978) have studied river runners, and Brown and Haas (1980) have studied wilderness backpackers. Based upon the ideas of these and several other authors, the ROS has been made operational for planning. It has been adopted by both the USDA Forest Service and USDI Bureau of Land Management (BLM) and thus is being applied on about 30 percent of the land area of the U.S. (Buist and Hoots 1982).

What is this planning system, how does it work, and how is it related to other resource outputs such as timber and wildlife?

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 (Clark and Stankey 1979). This idea is no different from suggesting that consumers are well served by producers supplying a variety of goods with which consumers can satisfy their desires. Specifically, in recreation it means that we might supply different opportunities for people to engage in specific recreation activities in specific recreation environments (or settings) to realize desired recreation experiences (Driver and Brown 1978). Further, the assumption suggests that these different opportunities can be arrayed along a spectrum of opportunities that are defined using activity, setting, and experience dimensions.

To plan and manage for an array of recreation opportunities, the Forest Service and BLM have divided the spectrum into six major zones, ranging from modern-urban to primitive opportunities. To enable the identification of land areas that can support these opportunities, standards that specify appropriate conditions for each zone have been articulated. 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 (e.g., USDA Forest Service 1981).

This basic approach to identifying recreation opportunities guides all stages of ROS planning. 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., wildlife).
4. Allocating and managing lands and waters consistent with RO decisions in activity three.

This planning system is not logically different from many other planning systems. It deals with the 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 analyses 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, while being refined based on what we are learning during its application, 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.

Since the purposes of planning are to define goals and select means of attaining goals, a major activity of ROS planning must be analysis on the demand side of the planning equation. There are many techniques available for this analysis (King and Davis 1980), but the key to any of them is defining recreation products in ROS terms. Therefore, rather than continuing to define the products of recreation management as activities (e.g., hunting, swimming, etc.), we need to define them as recreation opportunities, fully recognizing their activity, setting, and experience components. This enables the integration of demand information with supply information that is similarly articulated.

The supply analysis portions of the process are the most developed and enable the integration of ROS planning with other resource planning activities (Brown 1979). Identification of three characteristics of supply are of primary concern: type of opportunity, amount of opportunity, and quality of opportunity.

To identify type of opportunity, standards have been developed that specify acceptable conditions for an area's remoteness from sights and sounds of man, man caused modifications of the resource, size of area, human use and social situation, and managerial inputs. The output of this phase of supply analysis is

delineation on maps of areas that supply different types of opportunity along the spectrum. In essence, we identify areas having different recreational habitats as defined by physical, social, and managerial dimensions.

Once type of opportunity (ROS area) is identified, we have an area for which we can estimate amount of opportunity and evaluate the quality of opportunity. In estimating amount, we develop information based upon landscape features, such as vegetation, soils, topography, and water type and location, that enable characterization of capability areas within the ROS areas. Information on facility capacity is brought into the calculus, and estimates are made of the amount of recreation that can be supplied by capability area within ROS areas. Individual capability area amounts are then aggregated to determine ROS area amounts. For specific activities such as hunting, additional information, such as species and population information, would be input to arrive at amount.

Evaluating the quality of the recreation opportunity requires some additional information. Area attributes, such as diversity of landscapes and diversity of recreation opportunities, are important. Examining these kinds of attributes enables determination of the quality of opportunity within a type so that two areas of the same type can be compared.

The information in Table 1 is illustrative of the kind of tabular information produced during ROS supply analysis. This same information can be placed on maps so that one can see the spatial distribution of recreation opportunities and their characteristics.

In this particular instance, we have a 4,000-hectare (9,884-acre) area that contains three ROS zones: 800 hectares (1,977 acres) of rural opportunity, 1,600 hectares (3,954 acres) of roaded natural opportunity, and 1,600 hectares of semi-primitive non-motorized opportunity. Approximately 7,400 persons can be served at one time in the total area, and the quality of opportunity varies from moderate, in the rural and roaded natural zones, to high, in the semi-primitive non-motorized zone.

This brings us to the major focus of ROS planning, integration of recreation with other functional areas of resource management. In bringing recreation demand and supply information together to make land allocations, we need to consider how recreation affects other resource outputs and how management for other outputs affects recreation. This is possible in the ROS system because the land areas providing different recreation opportunities are delineated based upon specific standards for relevant conditions, as noted previously. Because these standards indicate acceptable conditions, the effect of any change in management, for any

Table 1. Recreation opportunity type, amount, and quality of a 4,000 hectare tract of land.

ROS class	Area (hectares)	Amount (paot)	Quality
Rural	800	4,000	Moderate
Roaded natural	1,600	3,200	Moderate
Semi-primitive non-motorized	1,600	160	High
Total	4,000	7,360	

output, on these conditions can be compared to the standards. We can evaluate the effects of recreation, wildlife, timber, or any other kind of management. Alternatively, we can determine what effect maintaining specific conditions for recreation will have on other resource outputs that might require changing the conditions.

For example, we might consider a proposal to harvest timber in the area identified in Table 1 that presently provides semi-primitive non-motorized forms of recreation. Harvesting the timber will require both building a road and manipulating the forest. Two criteria used in specifying the type of recreation opportunity are remoteness from the sights and sounds of man and human caused modifications of the resource, both of which would be affected by the harvesting activity. Therefore, if the road and harvesting sufficiently change the area's character, the recreation opportunity provided will be changed. In our example from Table 1, one harvesting proposal has the effect of reducing the semi-primitive non-motorized opportunity from 1,600 hectares (3,954 acres) to 1,200 hectares (2,965 acres), with a simultaneous increase in roaded natural opportunity of 400 hectares (988 acres). Due to the nature of the change, persons-at-one-time capacity for the entire area increased by about 800 persons. Also, the quality of the remaining semi-primitive opportunity declines to moderate while the quality of the roaded natural opportunity becomes high.

Such trade-offs as these are important to consider in resource planning, and the ROS planning system makes them possible. Although it is not possible to provide common units of measurement for tradeoffs of this sort (e.g., a timber allocation would be measured in terms of money and volume of fiber; recreation would be measured in hectares in ROS classes and number of people served), even non-common unit trade-offs give decision makers a much better notion of the kinds of gains and losses associated with alternative allocation decisions.

After appropriate land allocations are determined, it is necessary to manage the resource to insure desired production. The ROS planning system aids this activity because of the standards that are used to define recreation opportunities. These standards become parameters for management objectives that are articulated in ROS terms. As such, they provide guidance for recreation and other resource management and project planning because acceptable management actions and setting conditions are prescribed by the standards used to define recreation opportunity classes and to delineate each planned recreation opportunity. Once an ROS allocation is selected, management action and project plans are a natural outcome of allocation decisions.

ROS and Wildlife-Oriented Recreation

The ROS planning system gives us another tool for considering wildlife oriented recreation such as hunting, fishing, and birding. It enables specification of the kinds of recreation opportunities in which recreational use of wildlife takes place and provides a means for characterizing demands for recreational use of wildlife.

What it suggests on the demand side of the planning equation is a characterization of the activity, setting, and experience demands of wildlife users. On the supply side it suggests a characterization of what we can provide in the way of activity, setting, and experience opportunities.

To illustrate these points, we can refer to research undertaken in the Steens Mountain area of southeastern Oregon. This research focused on the relationship between deer hunter preferences for settings and experiences and the recreation opportunities provided at Steens Mountain.

The Steens Mountain Recreation Area is managed by the USDI Bureau of Land Management and covers approximately 960 square kilometers (370 square miles) of a very sparsely populated landscape. The nearest community (of 4,000 persons) is about 95 kilometers (59 miles) 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 that are remnants of former glaciation. The mountain rises about 1,500 meters (4,900 feet) above the surrounding desert.

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

Most of the hunting use of Steens Mountain occurs away from its loop access road in zones delineated as providing semi-primitive motorized opportunity. A few hunters hunt along the main loop road and in areas where motorized vehicles are excluded. For most Steens Mountain hunters the experience can be described as one where the environment is essentially natural, where the sights and sounds of man are not pressing users, where there is some opportunity for solitude, but where there are other hunters around, and where the presence of management is infrequent.

In reviewing the specific experience preferences of these hunters, we find that harvesting an animal is important for many of them, though certainly not for all. Additionally, experiencing nostalgia of previous hunts, exercise, learning and relating to nature, being with people in one's hunting group, and being a well-equipped hunter are powerful motivators for many hunters. Among 24 different experiences, only three, escaping family, meeting/observing new people, and risk taking were not important positive experiences desired from deer hunting at Steens Mountain (Lee 1982).

This kind of information about the places where people hunt and some of their desires for hunting experiences tells us many things we might consider as we manage resources and manipulate the supply of recreation opportunities. In the case of Steens Mountain, for instance, we need to be concerned about providing opportunities away from main roads and in essentially natural environments. We also need to be concerned with not eliminating opportunities for people to gain exercise, learn about and commune with nature, and have interaction within their group. On the other hand, we might avoid providing opportunities for people to meet other hunters and to experience environmentally oriented risks. In general, we might conclude that the desired hunting experiences at Steens Mountain fit into the semi-primitive motorized and non-motorized categories based upon the standards that define acceptable conditions for these two classes of opportunity. Also, we can use this information to specify even more definitely the character of the opportunities desired and define appropriate subclasses within the six general classes of recreation opportunity.

Knowing that these hunting opportunities are desired, the manager can see if he

can provide them on his area. Using ROS standards, he can identify the type, amount, and quality of opportunities provided at Steens Mountain and make recommendations to add more of the desired opportunities if necessary. Using the general framework for ROS planning, managers could look within these general opportunities to delineate more specific or sub-opportunities. This would require their specifying appropriate standards for the additional criteria used in subdividing the general classes of opportunity. With these additional standards, subclasses could be mapped and amount and quality of opportunity estimated.

Information about ROS zones in the Steens Mountain area could be used to direct hunters to areas providing desired opportunities. As has been mentioned elsewhere (Brown and Haas 1980), information about recreation opportunities can help users match their preferences with what is actually provided. Finally, because some wildlife management activities in the Steens Mountain area might require manipulating habitat or affecting populations, wildlife management might affect the type, amount, or quality of recreation opportunities. These effects can be judged because recreation opportunities have been determined for the area based on standards specifying specific requirements for each recreation opportunity.

This illustration from Steens Mountain is confined to deer hunting. But information about species preferences, preferences for other recreation activities, preferences for specific attributes of the setting in which hunting takes place, and location of activity also could be useful to managers dealing with wildlife-oriented recreation. The ROS planning framework enables the use of these kinds of information about user desires and behaviors in determining the types of opportunity to provide and in providing guidance for management.

Conclusion

The ROS planning system is a product of managers and researchers working together to develop a better tool for land management planning. The primary research input to it came from studies of users of recreation sites and areas. The ROS planning system has been shown to be applicable to a wide variety of situations and environments. It is still under development as we learn more about natural resources and human behavior, and its basic framework is being extended into related areas such as wilderness and wildlife management. For wildlife management and wildlife-oriented recreation, it enables identification of the kinds of recreation opportunities in which the specific activities fit, it enables determination of the effects of management activities on recreation and of recreation on other resource outputs, and it aids in helping match people and their preferences to the opportunities that actually can be offered.

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