

University of Montana

## ScholarWorks at University of Montana

---

Forest Management Faculty Publications

Forest Management

---

1-1978

### The Opportunity Spectrum – Concept and Behavioral Information in Outdoor Recreation Resource Supply Inventories: Background and Application

Perry J. Brown

*University of Montana - Missoula*, [perry.brown@umontana.edu](mailto:perry.brown@umontana.edu)

B. L. Driver

*USDA Forest Service, Rocky Mountain Forest and Range Experiment Station*

C. McConnell

*Colorado State University - Fort Collins*

Follow this and additional works at: [https://scholarworks.umt.edu/forest\\_pubs](https://scholarworks.umt.edu/forest_pubs)



Part of the [Forest Management Commons](#)

## Let us know how access to this document benefits you.

---

#### Recommended Citation

Brown, Perry J.; Driver, B. L.; and McConnell, C., "The Opportunity Spectrum – Concept and Behavioral Information in Outdoor Recreation Resource Supply Inventories: Background and Application" (1978).

*Forest Management Faculty Publications*. 31.

[https://scholarworks.umt.edu/forest\\_pubs/31](https://scholarworks.umt.edu/forest_pubs/31)

This Conference Proceeding is brought to you for free and open access by the Forest Management at ScholarWorks at University of Montana. It has been accepted for inclusion in Forest Management Faculty Publications by an authorized administrator of ScholarWorks at University of Montana. For more information, please contact [scholarworks@mso.umt.edu](mailto:scholarworks@mso.umt.edu).

# The Opportunity Spectrum Concept and Behavioral Information in Outdoor Recreation Resource Supply Inventories: Background and Application<sup>1</sup>

P. J. Brown, B. L. Driver, and C. McConnell<sup>2</sup>

---

The paper describes an outdoor recreation resource (ORR) Supply Inventory and Classification (SIC) System that is being developed for multiple use natural resource planning. Four previously developed ORR SIC's on which this system was built are described briefly. A general model for natural resource planning is presented to show how the proposed ORR SIC fits into a larger planning framework.

The proposed SIC System is described and its application for regional and unit planning is explained. Relationships between OR consumers' preferences for specific types of satisfying experiences and their preferences for specific attributes of the physical, social, and managerial settings are translated into specific and objective criteria proposed for inventorying and classifying lands as to their potential for providing particular types of OR opportunities on the spectrum.

---

Recreation resource supply inventories are fundamental to multiple use natural resource planning and management decisions. Therefore, it is important to have a sound system for making these inventories and for classifying the resource base.

Several criteria can be applied to evaluate the soundness of an outdoor recreation resource (ORR) supply inventory and classification (SIC) system. Those guiding the development of the system reported in this paper were:

1. It should have intuitive appeal to managers and give relevant and useful results.
2. It should be adaptable to the land planning and management processes (or models) being used by different agencies.

3. It should give consistent results when replicated in the same area by different people.

4. It should provide objective criteria for evaluating the recreation opportunity potential of different types of resources or landscapes.

5. It should assure that the total range of OR opportunities are covered.

6. It should not be overly complex and expensive to implement.

7. It should be based on tested social and behavioral science theories that are relevant to OR choice. OR opportunities must be defined in human as well as physical resource terms simply because of the nature of the demand for these services.

8. It should build on existing systems, if possible.

---

<sup>1</sup>Paper presented at the National Workshop on Integrated Inventories of Renewable Natural Resources, Tucson, Arizona, Jan. 8-12, 1978.

<sup>2</sup>Associate Professor, Department of Recreation Resources, Colorado State University; Recreation Research Project Leader, Rocky Mountain Forest and Range Experiment Station; and Recreation Staff Officer, Region 2, USDA, respectively.

We feel that each of these criteria is met by the ORR SIC system presented here. A companion paper in these proceedings presents the conceptual scaffold on which this behaviorally based system was built (Driver and Brown.)

In this paper we first describe a general planning framework into which our SIC fits. Then other ORR SIC's being used by resource management agencies are reviewed briefly. Finally, the application of the proposed SIC system is described for two levels of planning, area (or regional) plans and forest/unit plans. The system is useful for guiding site planning efforts too, but space does not permit elaboration of its application at that level.

#### A General Framework for ORR Planning

A general ORR planning process is common to most resource management agencies, though some emphasize different parts of the process. Figure 1 depicts an overview of this process and its integration into multiple use resource planning.

As indicated in box 1 of figure 1, ORR planning begins with a problem identification phase. This phase involves public participation activities, other external pressures for planning, and in-agency study and discussion.

After an expressed and felt need for planning is recognized, analyses of consumer preferences (2a), recreation participation (2b), and demand (3) are made. Consumer and participation analysis are divided into two boxes in the diagram to emphasize the current state of the art. Participation analyses are usually activity oriented and consist of counting the number of participants and time spent recreating during a fixed period of time. These data are usually incorporated into demand analysis through projection of past trends.

Consumer analyses represent a wider range of topics. Studies of user characteristics and preferences which usually focus on the preferred components of a quality experience are involved. The types of satisfaction that are desired are measured as well as attributes of physical, social, and managerial settings perceived by consumers as being important to their satisfaction. These attributes define the total environmental setting in which the OR activity takes place. (Driver and Brown, these proceedings) Consumer analyses of these physical, social, and managerial setting attributes feed directly into capability and suitability analyses (5 and 6).

Demand analysis produces an estimate of the quantity and quality of a specific activity

or experience opportunity demanded.<sup>3</sup> The output is a list of activity and experience opportunities to which subsequent inventory and planning activities are to be responsive. Although demand estimation is linked directly to both capability and suitability analyses, steps should be taken to assure that highly demanded opportunities are not overlooked during the inventory (box 4). Decision rules used to prioritize demands might focus on the largest demands, protection of minority demands, or demands for recreation opportunities which are highly resource dependent.

Box 5 reflects the capability analysis phase. Capability is the inherent potential of a long or water unit to provide specified goods or services according to clearly defined criteria.<sup>4</sup> The criteria are quantities and qualities of specific physical attributes of the land or water base. Since the criteria are specific, capability is measured as capable or not capable. To the extent possible, the criteria should be objective and not require subjective judgements by the person making the inventory.

The physical resource inventory is a component of capability analysis. As such, the resource elements need to be inventoried in terms of their potential for providing specific activity and experience opportunities. This is accomplished by using explicit and clear criteria which are set and defined before the supply inventory is started. By using fixed criteria (which can be changed if they are found inapplicable), an area can be evaluated as capable or not capable of providing an opportunity. The output from the capability analysis is a list of demanded activity and experience opportunities that the land and water base is inherently capable of producing. This list might be expanded or shortened by management activities considered in the suitability analysis.

---

<sup>3</sup>An experience opportunity is defined as that bundle of desired and expected psychological outcomes which are valued the highest by a particular user or user group. See the Driver and Brown paper in these proceedings for a fuller definition.

<sup>4</sup>This definition of capability, and the subsequent definition given for suitability, is consistent with definitions given in the Wildland Planning glossary by Schwarz et al. 1976.

**1. Planning Need Analysis**  
 (Public Participation, Problem Definition)  
 Output: Need to plan and kind of plan needed.

<p><b>2a. Consumer Analyses</b>          (User characteristics and OR-related preferences)          Output: Desires for activity, setting and psychological outcome opportunities.<sup>1</sup></p>	<p><b>2b. Participation Analyses</b>          (Monitoring)          Output: Present Uses and trends.</p>
--	--

**3. Demand Analysis**  
 Output: Quantity and quality of specific experience or activity opportunities demanded.

**4. Priority Demands**  
 (High priority demands, resource dependent, opportunities, etc.)  
 Output: List of opportunities to which inventory must be most responsive

**6. Suitability Analysis**  
 (Manageability of areas to provide experience and activity opportunities; recreation budget and other constraints considered; facility opportunities examined; allocation between recreation opportunities)  
 Output: List of experience and activity opportunities for which an area is managerially suitable. Amounts specified.

**5. Capability Analysis**  
 (Inventory of resource attributes required for experiences and activities; may consider present facilities and uses.)  
 Output: List of experience and activity opportunity potential of and area as inventoried.

**Suitability Analyses (i.e. Boxes 1-6) for Non-Recreational Uses (timber, forage, etc.)**

**7. Determination of Feasible Alternative Mixes of Uses**  
 (Identifying and evaluating alternative allocation scenarios)  
 Output: Specific management objectives for resource production including recreation experience and activity opportunities. Provided for several alternative mixes of uses.

**8. Public Review of Alternative Scenarios**

**9. Resource Allocation Decision**  
 Output: Management Plan with specific management objectives.

**10. Subunit Management Planning, Implementation, Monitoring, Evaluation, and Revision**

<sup>1</sup>See the Driver and Brown paper in these proceedings.

Figure 1. A General Framework for Outdoor Recreation Resource Planning.

Suitability analysis is represented in Box 6. Suitability refers to an estimation of the manageability of an area to provide specified activity and experience opportunities. Well defined criteria defining the quantities and qualities of the physical, social and managerial attributes necessary to manage the land effectively to provide desired recreation opportunities are necessary. Since the criteria are specific, suitability is indicated as suitable or not suitable.

In addition to classifying areas as suitable or not suitable for specific recreation opportunities, a capacity estimate is made for those areas classified as suitable. This capacity estimate enables the planner to indicate specific output associated with an allocation decision.

The suitability analysis is conducted in the same way as the capability analysis, but considers more items. Available management tools, budgets, personnel, technology, public acceptance, the presence of unique-rare features, and policy constraints are all important items. The effect of each of these items on whether or not it is managerially feasible to realize the inherent capability, or to modify it, must be weighed by the planner. The output from this process is a list of demanded activity and experience opportunities and the quantity of each opportunity that is managerially feasible to provide. This list might be carried to the next stage, identifying alternative mixes of uses (7), or it might be subjected to a compatibility analysis and recreation resource allocation. Because of competing uses for the resources, it is most likely that a decision will be made at this point to reduce the number of suitable recreation opportunities to move forward to the next stage.

Suitability analysis producing a list of the types and quantities of recreation opportunities which can be provided, represents the end of the recreation inventory and planning system (boxes 1-6 in figure 1). The output from the suitability analysis is then meshed with the outputs from similar systems for other goods and services (7) to produce alternative multiple use resource allocation plans. Here, recreation must compete with demands for other goods and services that the land base can provide. The output of box 7 is alternative allocation proposals that the public can review (8). A resource allocation decision is made from among these plans as they are modified by public review (9). This plan will contain specific management objectives relating to recreation uses. These objectives should be described in terms of specific physical, social,

and managerial setting attributes which make the activity and experience opportunities possible.

The specific recreation management objectives are the basis for developing more specific recreation plans below the forest plan level, for implementation of the unit plan, and for recreation system evaluation and revision (10).

The SIC system we have developed is first used in box 5 for capability analyses. Because it is a land classification as well as an inventory system, the logic of the system can be carried throughout the entire planning framework.

#### Reviews of Selected SIC Systems

Several ORR SIC systems have been developed over the past few years. Each has some strong points in theory, logic, simplicity, or comprehensiveness; but, each also has some serious limitations for use in ORR inventory and assessment. The systems used as a foundation for the system we propose are briefly described.

#### BOR Area Classification Plan

The purpose of the Bureau of Outdoor Recreation Area Classification Plan (ACP) is to provide a common framework for classifying recreation resources. The approach of ACP is cited as recreation zoning based upon relationships between physical resource characteristics and public recreation needs. The system attempts to encompass the full range of physical resources needed for all kinds of outdoor recreation activity and specify the types of management required for optimum recreation uses of each area. While the classification is based primarily on physical features, economic and social variables are important in classifying an area with the ACP.

The ACP is designed for applicability to large geographical areas regardless of land ownership. All land with a potential for recreation is divided into the following classes: Class I, high density recreation areas; Class II, general outdoor recreation areas; Class III, natural environment areas; Class IV, outstanding natural areas; Class V, primitive areas; Class VI, historic and cultural sites. The area classification is based on a general description, the types of activities which take place, the degree of development, and agency responsibility and management recommendations. The classification system does not represent a continuum based on a combination of these variables.

Quite broadly, Classes I, II, and III are separated primarily in terms of their proximity to an urban setting and degree of development. Class IV is chiefly a measure of the uniqueness of the natural setting, and Class VI is distinguished as having historic value. Class V is the designation given to congressionally and administratively designated wilderness and primitive areas.

The method of assigning an area its class code is largely subjective. In addition to classifying an area in terms of the guidelines mentioned above, the ACP recommends that the classification process also give attention to economic and social considerations, public needs for different kinds of recreation opportunity, uses of other natural resources, and objectives of the land owner. The ACP also suggests that when the physical features and location of an area permits it to be classified in more than one class, it should be placed in the class which will produce optimum recreation values in the long run.

The most serious shortcoming of the BOR Area Classification Plan is that its criteria for classifying areas are too general and require too much subjective judgment on the part of the planner. In addition, it is unclear if the system represents an inventory classification based on the inherent recreational potential of the area or, instead, a suitability classification based on what the agency feels the area should offer. There is a lack of distinction between identification of the inherent capability of an area and recommendations based on management philosophy and policy without sufficient attention given to separate and systematic capability and suitability analyses.

#### Recreation Opportunity Inventory and Evaluation

The Recreation Opportunity Inventory and Evaluation (ROIE), developed in Region 1 of the USDA Forest Service, attempts to identify potential recreation opportunities as well as potential recreation uses. Activity preferences serve as the base for inventory and evaluation. These preferences have been grouped into preference types: active-appreciative, active-extractive, passive-appreciative, sociable-learning, and active-expressive. Elements of the environment relating to each of these preference types are inventoried first. Then, the land is classified according to its capability to provide opportunities for one or more types. These two processes result in a measurement of recreation opportunity by preference type for each unit of land. The land units delineated are called Recreation Experience Units (REU's).

Once lands have been classified to show the opportunities available for each preference type, social visitation capacities are estimated. Several kinds of quantitative data are combined to provide these estimates.

The ROIE has several factors which make it a good recreation inventory and planning system. First, it focuses on inventorying opportunities to meet recreationists' preferences. Second, it attempts to relate environmental attributes to the preference types. And, third, it enables capacity estimation.

One limitation of the method is its limited foundation in empirical research. Both the lists of preference types and environmental attributes were judgmentally produced, and the relationships between these two lists are inferred. Other limitations relate to the cost and complexity of the system caused by using unnecessary mathematical synthesis of the data, the frequent use of subjective ratings, and criteria which limit the method's applicability to mountainous terrain.

#### Recreation Inventory Instructions

The Recreation Inventory Instructions (RII)<sup>5</sup> attempt to specify and describe the attributes of forestland in terms of kind, quality, and amount of recreation use which it is capable of supporting without unacceptable depreciation. There is an implied behavioral base to this method since recreation is defined as the response of people to certain basic needs or motives.

Measurements of quality and quantity are made for three phases of the recreation resource:

1. Dispersed Phase--a description of lands and waters with characteristics for activities which occur in dispersed forms.
  2. Intensive Phase--a description of lands and water with the characteristics for development to support recreation activities which occur in relatively concentrated or mass form.
  3. Visual Phase--a description of selected individual features, objects, or conditions of prominence which contribute to scenery as viewed by people.
- For each of these phases, qualitative criteria are evaluated and summary indexes are produced. The higher the summary index for each phase,

---

<sup>5</sup>Developed by Gordon Sanford and included in Forest Service Manual Section Nos. 2303.1 and 2331.11c, as of November 1977.

the higher the land quality for providing those recreation activity opportunities described for that phase.

Capacity estimates are generated for the classified lands using either comparative analyses or using generalized RII guidelines. Where appropriate, the RII relies on RIM procedures for estimating capacity.<sup>6</sup>

The structure of RII is a solid approach to the inventory process. It assumes a behavioral orientation although the theoretical basis for this is not explicit. It attempts to relate land area attributes to recreation experience classes. It provides a procedure for estimating capacity. And, it attempts to mesh with other recreation planning and management procedures, like those in the Forest Service's RIM system.

The RII is limited by not being founded upon an empirical research base. Additionally, some of the psychological notions underlying the method appear to be erroneous. A further complication with RII is its specification of experience levels which implicitly puts a premium on primitive and natural environment types of recreation. Finally, the system is not easy to implement in its entirety.

#### Canadian Land Inventory

The Canadian Land Inventory (CLI) is a straightforward way to arrive at estimates of recreational capability. The method provides an overview of the quality, quantity, and distribution of natural recreation resources. The basic inventory unit is the land form or land unit which is delineated by the relative homogeneity of physical features within that unit.

Based upon a set of resource attributes related to activity subclasses, the capability of the land to provide opportunity for each activity subclass is measured. Subjective judgments are then used to produce class rankings for each land unit. These rankings range from very high capability to very low capability.

The CLI provides a basic organizing framework for recreational inventory that is simple and easy to implement. It also makes the relationship of inventory to the planning process explicit by inventorying to produce estimates of capability.

---

<sup>6</sup>RIM designates the Recreation Information Management System of the USDA Forest Service which is used to collect and store recreation participation data.

This system has not taken advantage of the results of recreation behavioral research. However, it can easily incorporate research data or attribute-activity relationships as they become available. Another shortcoming is that it uses only activity classes and subclasses without any recognition of the specific experience opportunities demanded, or to be supplied. The method also does not incorporate suitability analyses or lead to estimation of capacity—both of which are necessary for ORR planning.

#### Summary of Review of Other SIC Systems

The ACP system has limited applicability to ORR supply inventory needs of most resource management agencies. Several good ideas, however, are embodied in the ROIE, RII, and CLI systems, and can be used in development of a better SIC system. A better system could derive its framework from the CLI and specify a relationship between experience opportunities and attributes of the physical, social, and managerial settings in which preferred experiences take place. Like the CLI, the improved system should involve an identification of inherent capability based upon inventory and evaluation of the physical attributes of the land and water base. It should go beyond the CLI and deal with suitability analysis as well. Like the ROIE, the system should be behaviorally based and acknowledge the importance of user preferences. And, like the ROIE and the RII, the system should deal with experience opportunities and with generating quantitative estimates of opportunity (capacities). Our proposed SIC system has built on the strong points of each approach.

#### Proposed ORR SIC System

Outdoor recreation resource planning takes place at several levels: (1) national planning; (2) area or regional planning; (3) subarea planning (e.g., forest); (4) unit planning; and (5) site planning within management units. The SIC discussed in this paper has been developed for regional, forest, and unit level planning. It is applicable to other levels as well, but that has not been our focus.

#### Regional ORR Supply Inventories

The regional ORR SIC system we propose is being developed in Region 2 of the USDA Forest Service. In structure, it builds upon the foundations provided by the ROIE, RII, and CLI systems previously discussed. It is a system which recognizes the need to specify both experience opportunities and settings (physical, social, and managerial) in which the opportunities can be provided. It also recognizes the state of the art which presently can be applied

to regional recreation planning efforts and, in most cases, can be applied to unit and sub-regional planning as well.

As explained in detail in the Driver and Brown paper in these proceedings, the SIC we are developing is based on the concept of a recreation opportunity spectrum (Wager 1966; Lloyd and Fisher 1972; Stankey 1977; Driver and Brown, these proceedings) with the spectrum defined in terms of experience opportunities. We have labeled it the Recreation Opportunity Resource and Classification System, or RORCS for short. The experience opportunity classes defined by the spectrum and their associated physical, social, and managerial settings are shown in table 1. That table was modified from Gordon Sanford's Experience Levels, which are a part of the RII approach reviewed previously. (See Forest Service Manual Section Nos. 2303.1 and 2331.11c, as of November 1977.) For simplicity, the experience opportunity classes are labeled primitive, semi-primitive non-motorized, semi-primitive motorized, rustic, concentrated, and modern urbanized. Specific activity opportunities can be associated with each point on the spectrum.

To identify lands capable of producing different opportunities at the different points on the spectrum, a set of specific criteria is necessary. Table 2 contains sample criteria, a lengthy list was narrowed to the four shown in order to keep the system simple. Also, we believe that too many criteria are: (1) size of area; (2) remoteness; (3) irreversible evidence of man; and (4) renewable resource modification. Specific standards for each criterion and each recreation opportunity class are also given in Table 2. Those standards are objective but they allow the planner to use his professional judgment. Also, they are being modified as the system is being applied.

Using Table 2 to identify capability follows a sequential process. First, remoteness is assessed by drawing lines on a map at the intervals from roads, with the intervals shown in the table. Once these lines are drawn, the area inside connecting lines can be calculated. Then, based upon inventories of permanent evidences of man and renewable resource alteration, one can describe the amount of area affected.

To apply the standards to determine recreation opportunity classes on the spectrum, the planner need only match the mapped or calculated data to the values given in each row of the table. For instance, if an area of 10,000 acres was located more than three miles from any constructed road, contained less than one

percent of its area in an irreversibly modified state, and had been grazed by cattle over 20 percent of its area, (a nonpermanent alteration) it would be capable of producing all six types of opportunity. If cattle grazing had taken place over 45 percent of the area, then the applicable recreation opportunity classes would exclude primitive. An indication that multiple opportunities can be provided recognizes that developments and changes in the resource base preclude less development-oriented recreation, but that more development-oriented opportunities are not restricted by the resource base. Development-oriented opportunities depend primarily upon investment levels.

After the recreation opportunity capability class on the spectrum has been identified, coefficients can be applied to indicate the capacity, or possible production output, for each classified area. Sample maximum supply coefficients are shown in Table 3. These could be adjusted for season of use, total area, or to persons at one time with very little effort.

Application of the RORCS at the regional level actually combines capability and suitability analyses into one step. This seems reasonable to us at the regional level because the recreation opportunities examined are general, and regional plans usually have a policy-guidance focus, rather than a specific on-the-ground action focus. If a recreation planner needed to know which specific recreation opportunities to supply, more specific physical resource, social, and management setting information would be required and the planning process could be divided into more discrete steps like capability and suitability analyses.

While use of this system was successfully demonstrated on the Pike National Forest, it is still being developed. Two major limitations of the system are the limited research base for setting criterion standards and for deriving capacity coefficients.

#### Unit ORR Supply Inventory

Within each of the outdoor recreation opportunity classes identified by using the RORCS at the regional level, there are many activity and specific experience opportunities. For each appropriate activity within one of the regional recreation opportunities, there is a specific experience opportunity made up of the bundle of most preferred psychological outcomes. For each specific experience opportunity there are many physical, social, and managerial attributes of the recreation setting which help users have high quality experiences.



Table 1. The Recreation Opportunity and Resource Classification Spectrum, with the associated experience opportunity classes and their associated physical, social, and managerial settings requirements.

Opportunity Class	Experience Opportunity	Physical, Social, and Managerial Setting
Primitive (P)	Opportunity for isolation (from the sights and sounds of man), to feel a part of the natural environment, to have a high degree of challenge and risk, and to use outdoor skills.	Area is characterized by essentially unmodified natural environment of fairly large size. Concentration of users is very low and evidence of other area users is minimal. The area is managed to be essentially free from evidence of man-induced restrictions and controls. Only essential facilities for resource protection are used and are constructed of on-site materials. No facilities for comfort or convenience of the user are provided. Spacing of groups is informal and dispersed to minimize contacts with other groups or individuals. Motorized use within the area is not permitted.
Semi-primitive non-motorized (SPNM)	Some opportunity for isolation from the sight and sounds of man, but not as important as for primitive opportunities. Opportunity to have a high degree of interaction with the natural environment, to have moderate challenge and risk, and to use outdoor skills.	Area is characterized by a predominantly unmodified natural environment of moderate to large size. Concentration of users is low, but there is often evidence of other area users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but are subtle. Facilities are primarily provided for the protection of resource values and safety of users. On-site materials are used where possible. Spacing of groups may be formalized to disperse use and provide low-to-moderate contacts with other groups or individuals. Motorized use is not permitted.
Semi-primitive motorized (SPM)	Some opportunity for isolation from the sights and sounds of man, but not as important as for primitive opportunities. Opportunity to have a high degree of interaction with the natural environment, to have moderate challenge and risk, and to use outdoor skills. Explicit opportunity to use motorized equipment while in the area.	Area is characterized by a predominantly unmodified natural environment of moderate to large size. Concentration of users is low, but there is often evidence of other area users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but are subtle. Facilities are primarily provided for the protection of resource values and safety of users. On-site materials are used where possible. Spacing of groups may be formalized to disperse use and provide low-to-moderate contacts with other groups or individuals. Motorized use is permitted.

Table 1. (Continued)

Opportunity Class	Experience Opportunity	Physical, Social, and Managerial Setting
Rustic (R)	<p>About equal opportunities for affiliation with user groups and opportunities for isolation from sights and sounds of man. Opportunity to have a high degree of interaction with the natural environment. Challenge and risk opportunities are not very important. Practice and testing of outdoor skills may be important. Opportunities for both motorized and non-motorized forms of recreation are possible.</p>	<p>Area is characterized by predominantly natural environment with moderate evidences of the sights and sounds of man. Such evidences usually harmonize with the natural environment. Concentration of users may be low to moderate with facilities sometimes provided for group activity. Evidence of other users is prevalent. Controls and regimentation offer a sense of security and are on-site. Rustic facilities are provided for convenience of the user as well as for safety and resource protection. Moderate densities of groups is provided for in developed sites and on roads and trails. Low to moderate densities prevail away from developed sites and facilities. Renewable resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is provided for in construction standards and design of facilities.</p>
Concentrated (C)	<p>Opportunities to experience affiliation with individuals and groups are prevalent as is the convenience of sites and opportunities. These factors are generally more important than the setting of the physical environment. Opportunities for wildland challenges, risk taking, and testing of outdoor skills are unimportant, except for those activities like downhill skiing for which challenge and risk taking are important.</p>	<p>Area is characterized by substantially modified natural environment. Renewable resource modification and utilization practices are primarily to enhance specific recreation activities and to maintain vegetative cover and soil. Sights and sounds of man are readily evident, and the concentration of users is often moderate to high. A considerable number of facilities are designed for use by a large number of people. Facilities are often provided for special activities. Moderate to high densities of groups and individuals are provided for in developed sites, on roads and trails, and water surfaces. Moderate densities are provided for away from developed sites. Facilities for intensified motorized use and parking are available.</p>

Table 1. (Continued)

Opportunity Class	Experience Opportunity	Physical, Social, and Managerial Setting
Modern urbanized (MU)	Opportunities to experience affiliation with individuals and groups are prevalent as is the convenience of sites and opportunities. These factors are more important than the setting of the physical environment. Opportunities for wildland challenges, risk taking, and testing outdoor skills are unimportant.	Area is characterized by a substantially urbanized environment, although the background may have natural elements. Renewable resource modification and utilization practices are to enhance specific recreation activities. Vegetative cover is often exotic and manicured. Soil protection usually accomplished with hand surfacing and terracing. Sights and sounds of man, on-site, are predominant. Large numbers of users can be expected both on-site and in nearby areas. A considerable number of facilities are designed for the use and convenience of large numbers of people and include electrical hookups and contemporary sanitation services. Controls and regimentation are obvious and numerous. Facilities are provided for special activities. Facilities are highly intensified motor use and parking are available with forms of mass transit often available to carry people throughout the site.

At the forest and unit levels, additional information is needed which enables identification of capability and suitability to produce opportunities for specific psychological outcomes. It is necessary to estimate capacity along with identification.

The state of the art generally does not allow the degree of specification needed. Most preferred psychological outcomes for most activities are not yet fully defined, though research is beginning to provide needed answers (Driver 1976a & b; Driver and Knopf 1977; Brown et al. 1977; Hautalouma and Brown 1977; Driver and Cooksey 1978). Also, far too little is known about the situational attributes which facilitate satisfying recreational experiences.

To meet these informational needs we have begun research to identify relationships between specific experience opportunities and physical resource attributes. Initial studies looked at the two components separately while our current work attempts to integrate them. Most of that current work focuses on primitive and semi-primitive non-motorized opportunities and environments.

We have identified several of the psychological outcomes desired by users of the

Rawah Wilderness and have identified groups of users desiring similar sets of outcomes.<sup>7</sup> In the Rawah, five user groups were identified. These groups have different preferences with the two most different desiring: (1) only opportunities to experience nature and a change from home and work environments, and (2) opportunities to experience nature, a change from home and work environments, challenge, freedom of time and movement, self-realization, and risk-taking.

In the Indian Peaks backcountry, located south of Rocky Mountain National Park in Colorado's Front Range, we began our examination of physical resource attributes identified by recreationists as contributing to or detracting from their recreational satisfaction.<sup>8</sup> In that study, nine dimensions of the resource base were identified which either added to or detracted from the user's recreation experience.

<sup>7</sup>This study was supported by the McIntire Stennis Forestry Research Program at Colorado State University, project No. 5358.

<sup>8</sup>This study was supported by the RPA Research and Development project of the Rocky Mountain Forest and Range Experiment Station, cooperative agreement 16-681-CA.

Table 2. Recreation opportunity capability criteria.

Criterion name	Required standard by opportunity class					
	P	SPNM	SPM	R	C	MU
<u>Size of area</u> (acres)	≥ 5000	≥ 2500	≥ 5000	≥ 1	≥ 1	≥ 1
<u>Remoteness</u> (sights and sounds of man) (miles or equivalent screening)	≥ 3 miles from any constructed road	> 1/4 mile from any constructed road	≥ 1/4 mile from any constructed road	≥ 1/4 mile from any primary road	≥ 1/4 mile from any primary road	≥ 0 miles from any road
<u>Irreversible evidence of man</u> (mines, reservoirs, roads, etc. which cannot be feasibly obliterated)  (% of total area)	0-1% of area	0-5% of area	0-5% of area	0-25% of area	0-100% of area	0-100% of area
<u>Renewable resource modification</u> (Nonpermanent alteration natural environment)  (% of total area)	0-30% of area	0-70% of area	0-70% of area	0-70% of area	0-100% of area	0-100% of area

These nine attribute dimensions are listed in Table 4 along with a description which indicates how much each adds to or detracts from the perceived level of satisfaction. Most of the attribute dimensions have positive values and are perceived as adding to satisfaction with the meadow-forest and water related dimensions being the most positive. Intrusions are perceived as detracting from positive recreational experiences.

The next step in this research is to integrate the two kinds of information. Our first study designed for this purpose is of users of the Flat Tops Wilderness in western Colorado.<sup>9</sup> The same psychological outcome

<sup>9</sup>This study has been supported by the McIntire-Stennis Forestry Research program at Colorado State University, project 5348 and the Rocky Mountain Forest and Range Experiment Station, cooperative agreement 16-646-CA.

measurement scales used in the Rawah and the same resource attribute scales used in the Indian Peaks were employed in the Flat Tops study. Analysis is currently underway, and it appears that it is possible to relate specific resource attributes to specific sets of psychological outcomes (or experiences) preferred by Flat Tops users.

The ability to relate resource attributes to sets of psychological outcomes fits precisely the needs of our proposed application of the RORCS at the forest and planning unit level. To accomplish an experience opportunity capability analysis, it is necessary to know which resource attributes are necessary for each experience opportunity and which detract from each opportunity.

While the relationships between experience opportunities and physical resource attributes are being determined, three other components of the ORR SIC process need to be studied.

Table 3. Hypothetical recreation day coefficients to determine maximum supply.

Opportunity Class	Coefficients
Primitive (P)	8 Recreation days/acre/year
Semi-primitive non-motorized (SPNM)	20 Recreation days/acre/year
Semi-primitive motorized (SPM)	20 Recreation days/acre/year
Rustic (R)	1,800 Recreation days/acre/year
Concentrated (C)	7,300 Recreation days/acre/year
Modern urbanized (MU)	36,500 Recreation days/acre/year

Table 4. Effect of the nine resource attribute dimensions identified in the Indian Peaks study on perceived level of satisfaction.

Dimension	Effect on user's perceived level of satisfaction
Meadow-forest	Adds strongly
Water related	Adds strongly
Wildlife	Adds moderately to strongly
Dense vegetation	Adds moderately
Rugged topography	Adds moderately
Rare or unique natural features	Adds moderately
Fish related	Adds moderately
Nuisances	Neither adds nor detracts
Intrusions	Slightly detracts

First, there is a need to develop measurement techniques for the physical resource attributes. Second, there is a need to identify and measure preferred social and management attributes of the recreational setting. Third, there is a need to determine maximum (and in some cases, minimum) capacity levels for different experience opportunities.

#### Citations

- Brown, P. J., J. E. Hautaluoma, and S. M. McPhail 1977. Colorado deer hunting experiences. Paper presented at 42nd North Am. Nat. Wildl. and Nat. Resour. Conf., Atlanta, Ga.
- Driver, B. L. 1976a. Toward a better understanding of the social benefits of outdoor recreations participation. p. 163-189. *In* Proceedings of the Southern states recreation research applications workshop. USDA For. Ser. Gen. Tech. Rep. SE-9, Southeastern For. Exp. Stn., Asheville, N.C.
- Driver, B. L. 1976b. Quantification of outdoor recreationists' preferences. *In* Research camping and environmental education, Betty van der Swissen, editor. Penn. State Ser. 11, 508 p., Univ. Park, Penn.
- Driver, B. L., and R. C. Knopf 1977. Personality outdoor recreation, and expected consequences. *Environ. and Behav.* 9(2):169-193.
- Driver, B. L., and R. W. Cooksey. [In press.] Types of psychological outcomes desired from fishing. Proceedings of nat. sport fishing symp., Humboldt State Univ. Arcata, Calif.
- Hautaluoma, J. E., and P. J. Brown. [In press.] Attributes of the deer hunting experience: A cluster analytic study. *J. Leisure Res.*
- Lloyd, R. D., and V. L. Fisher. 1972. Dispersed versus concentrated recreation as forest policy. Seventh World Fr. Congress Proc., 196(E) Buenos Aires, Argent.
- Schwarz, C. F., E. C. Thor, and G. H. Elsner. 1976. Wildland planning glossary. USDA For. Serv. Gen. Tech. Rep. PSW-13, Pac. Southwest For. and Range Exp. Stn. Berkeley, Calif.
- Stankey, G. H. 1977. Some social concepts for outdoor recreation planning. *In* Outdoor recreation: Advances in application of economics. p. 154-161. USDA For. Serv. Gen. Tech. Rep. W002, Washington, D. C.
- Wagar, J. A. 1966. Quality in outdoor recreation. *Trends in Parks and Rec.* 3(3):9-12.