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SITE ATTRIBUTES---A KEY TO MANAGING WILDERNESS AND DISPERSED RECREATION

Roger N. Clark and George H. Stankey

ABSTRACT: Knowledge of important recreation sites and their attributes will assist managers in evaluating the consequences of changes as a result of other resource uses on dispersed recreation opportunities both within and outside of wilderness. Such information aids in developing strategies to prevent or mitigate undesirable impacts while taking advantage of positive changes to provide a desired range of public benefits. A case example for identifying important attributes of potential recreation sites in southeast Alaska is described. Suggestions on how to incorporate this information into multiple resource planning and management are discussed.

THE PROBLEM

Knowing the importance forest visitors attach to particular features of recreational settings (called "site attributes") is the foundation of effective recreation management. Without information about these attributes, land managers cannot maintain or enhance desirable qualities, nor can they prevent or mitigate damage to recreational values as a result of other forest uses, such as timber management. There is a need for a better understanding of what attributes users require in recreation settings and how adverse impacts on these attributes can be avoided and positive effects enhanced.

It is generally accepted that recreational opportunity settings consist of three components: the physical-biological setting includes those qualities provided by nature, such as vegetation, topography, and water; the social setting includes those qualities associated with people, such as the type and amount of use in an area; the managerial setting includes those conditions provided by management, such as rules and regulations, developmental activities, roads, and recreational facilities (Clark and Stankey 1979). Collectively, these three components provide the conditions that give places recreational significance.

The above description provides the overall concept of recreational settings but does not identify the needed level of detail about the components and their effect on an area or a site's role in providing recreational opportunities. If, for example, resource extraction is an important part of management, what are the roles of different resource management activities, conducted in different fashions and at different times and scales, on various kinds of wilderness and nonwilderness recreation? This level of detail is necessary for good recreation planning and for evaluating how changes brought about by development will affect recreation.

SITE ATTRIBUTES: WHAT ARE THEY?

Attributes are the characteristics or qualities of a site; for example, trees, water, wildlife, facilities, easy access, solitude, flat ground, and protection. Attributes can be either positive or negative depending on one's point of view: natural vs. modified areas, or few vs. many people. User preferences identify what is acceptable and to whom.

Setting attributes can be defined at three general levels:

1. Locational attributes--This category includes the spatial characteristics of a site relative to the origin of the recreationist. It includes such specific measures as distance and time from home and measures the difficulty of access due to terrain and other physical-biological barriers.

2. Macrosite attributes--This category includes characteristics that describe the surroundings in which a recreation site is found. It includes broad descriptions of the physical, biological, and social surroundings, scenic conditions, and the type, level, and scale of modifications in the landscape. The Recreation Opportunity Spectrum (ROS)(Brown and others 1978; Clark and Stankey 1979; Driver and Brown 1978) as well as the Visual Management System (USDA Forest Service 1977) are most often applied at this level.

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3. Microsite attributes--This category involves site-specific features including most of the elements discussed earlier under the physical, social, and managerial subsettings. These features give sites recreational significance in terms of the experiences provided and affect the nature of activities that are possible. They also help identify which management actions are most likely to affect recreation use in either positive or negative ways.

A wide range of variables underlie this three-tiered attribute framework. Some variables are found in more than one category depending on the level of specificity at which they are measured. For example, broad scenic classifications might be a satisfactory level of measurement at the macrolevel; more detailed measures of scenic quality, such as the view from a campsite, might be required at the site level or microlevel.

Defining attributes contributes to an understanding of the qualities of a location that influence usage and user satisfaction. In addition to the spatial classification described above, attributes also can be classified in terms of how they operate in the recreational choice process; they may be categorized as requisite or supplementary and as facilitating or constraining.

Requisite attributes are those necessary or essential for a certain activity; for example, flat ground is necessary for camping or water is necessary for boating. Supplementary attributes are not required for an activity, but may influence people's choices; for example, scenic beauty is not necessary to engage in most activities, but is desirable for most people.

Some qualities act as facilitators or attractors: their presence allows or attracts use and increases satisfaction. Other qualities act as constrainers or detractors: they make sites difficult to use or undesirable and unlikely to meet visitors' desires. The following listing shows examples of both types.

Facilitators/ attractors	Constrainers/ detractors
Scenery	Litter
Activity opportunities (crabbing, fishing, etc.)	Resource damage
Sheltered anchorage	Noise
Flat spot to camp	Shoals
Accessible beach	Unprotected waters
	Steep ground

Thus, it is possible to organize recreation setting attributes into a variety of categories. Each provides an alternative concept of the function and purpose of attributes and how they are used in the recreationist's decisionmaking process. These different conceptions of attributes are complementary to one another; they are not necessarily mutually exclusive (fig. 1).

WHY IS A KNOWLEDGE OF SITE ATTRIBUTES IMPORTANT?

Attributes constitute the features that define an area or site as a recreational resource. Knowing what these attributes are, their relative importance to recreationists participating in different activities or seeking different experiences, and the sensitivity of the attributes to change is essential input to integrated resource management. Alterations in settings induced by nonrecreational resource uses can change greatly the type of recreational opportunities available. Conversely, maintaining the essential attributes of a particular recreational opportunity setting might represent a significant constraint on other uses. For example, a management objective to maintain semiprimitive or primitive recreation opportunities would limit the nature and extent of timber harvest activities appropriate in the

Figure 1.--Some site attributes act as facilitators or as attractors. For example, adequate flat space to camp in attracts use. Other qualities act as constrainers or detractors; for example, the presence of litter makes sites less likely to meet visitor's desires.

area. Understanding these interdependencies is essential to the integration of different resource allocations and to minimizing conflict (Clark and others 1985).

Many factors are involved in the complex decisionmaking process that recreationists undergo in considering where to go and what to do (Stankey and McCool 1985). Some of these factors are not subject to management influence (for example, the weather) or are not even related to the nature of the place or the activity (Are family or friends available with whom to recreate?). The condition of the attributes, such as those described above, is a factor, however, in the choices that many people make. Management can either directly influence these conditions or can provide recreationists with information regarding them.

Failure to accurately determine which attributes truly affect recreation choices may lead to designation or development of areas unlikely to be used. For example, Lime (1971) found that some campgrounds in Minnesota that were located and designed according to engineering standards failed to attract users; these sites were not defined as attractive by recreationists. Such mismatches can be costly in terms of agency budgets as well as in user satisfactions.

Attributes provide a basis for identifying compatibilities and conflicts with other resource uses. Because they describe setting conditions, they reveal how different uses of a setting, such as log storage and recreation use in bays and coves, produce compatibilities or conflict. Whether the situation is one where the effects of the resource use is an attractor or detractor (or has a neutral effect) depends on user preferences.

Presently, there is no systematic and objective method for identifying attributes that constitute or help define important recreation sites. We are generally unable to predict, in advance of use, what determines key recreation sites. In areas managed for timber production, for example, recreation sites and uses compatible with timber management activities are most often a result of timber management, rather than an intentional objective (Clark and others 1984). Consequently, in most cases, we do not know what may have been missed in recreation opportunities had recreation objectives been considered prior to the design and layout of roads and timber harvesting boundaries.

USE OF SITE ATTRIBUTE INFORMATION

Information about recreation site attributes can be used in all phases of ROS planning as described by Stankey and others (1984). Phase I involves a description of "what is", and such basic inventories depend on identification of the features and qualities to be inventoried. Phase II involves an identification of "what can be", a capability assessment, and provides managers with the range of suitable alternatives they might consider. Attribute data would be essential input to this analysis. In Phase III, selection of a preferred recreation alternative occurs. Attribute data are necessary to help formulate this alternative. In Phase IV, the preferred recreation alternative is incorporated into an integrated resource management program. Depending on other resource values and demands, the preferred recreation alternative might be wholly retained or modified substantially. Finally, in Phase V, the consequences and implications of the adopted integrated management alternative are appraised through a monitoring and evaluation program. This phase allows managers to determine the relationship between intended and actual consequences and to adjust, as necessary, the management actions needed to achieve their objectives (fig. 2).

A knowledge of key sites and attributes--their importance and location--aids evaluation of the magnitude and importance of potential effects of timber management activity at both macrolevels and microlevels. This involves several steps:

1. Step one is to identify actual and potential recreation sites. Onsite inventories and secondary sources such as topographical maps, nautical charts (in marine areas), and vertical and oblique low-altitude color photos are used. Criteria for selection of probable sites are developed (for example, accessibility by water for different types of boats).

2. Step two is a description of the likely impacts associated with the planned timber harvesting activity on the sites defined in step one. Measures of both the intensity and extent of the effects can be developed (Clark and others 1985). Effects include visual and sound changes in the area. A model of sound spread developed

Figure 2.--Current inventories of "what is" indicate that much of southeast Alaska is undeveloped. Future management direction to determine "what will be" will require information on supply of and demand for various forest services, including developed and undeveloped areas for recreation.

earlier (Harrison and others 1980) appears to have applicability here as do computer techniques for visual management. Impacts on sites can also be compared to other information about recreation opportunities such as visual quality and activity opportunities including fishing, hunting, and berry picking.

3. In step three, the anticipated impacts are evaluated for their consequences. A typology of impacts ranging from complete loss of the site, to no impact, to positive effects can be utilized in this process. Evaluation requires managers to examine effects in light of considerations such as: Which recreation experiences will be improved and which will be diminished? Will new and needed opportunities be created in the area? Will users be displaced? Do real choices exist for displaced visitors? What is the relative availability and accessibility of opportunity settings that will be adversely affected? What are the cumulative effects of the changes both in and out of wilderness on a regional/subregional basis? Will the effects lead to changes that exceed those judged as appropriate and acceptable in areas where limits of acceptable change have been identified? (Stankey and others 1985) (for example, will construction of logging roads or logging camps adjacent to wilderness lead to increased use within the area?). Answers to these and similar questions provide recreation managers with input to interdisciplinary teams evaluating proposed timber management plans.

4. The final step involves identifying strategies that enhance positive effects or prevent or mitigate potential adverse effects. In particular, strategies involving alternatives in timing, spacing, and design of cutting units, roads, log dumps, and so forth appear useful in contending with negative effects. In other cases, providing information to users (both area residents and tourists) about the nature of the impacts likely to be encountered will help shape realistic expectations and temper dissatisfaction. Or, alternative opportunities can be identified as a means of compensating users for the loss of favored sites. Public involvement will be necessary to determine the appropriateness of the alternatives suggested by managers.

SOUTHEAST ALASKA: A CASE EXAMPLE

The relationship between dispersed recreation use and timber management activity in southeast Alaska provides an ideal situation for studying many of the above issues. Southeast Alaska is an extensive area of natural or partially altered land. It contains outstanding opportunities for primitive and semiprimitive recreation opportunities both within and outside of designated wilderness, primarily along the thousands of miles of coastline.

Because of the planned changes in southeast Alaska from timber management and other resource management activities, there is a need to identify the nature and location of effects on recreation opportunities, to define the consequences of these impacts, and to help prescribe steps to prevent or mitigate negative effects while enhancing positive effects. There is a fundamental need to identify the location of key or critical recreation sites that presently support or have the potential to support a variety of recreational uses. This is not an easy task. The region is a marine archipelago with over 26,000 miles of tidal shoreline. Roads are generally nonexistent between communities, so boats and planes are the main means of travel outside towns (Clark and Lucas 1978). Because of the marine orientation in the region, most important recreation opportunities are close to the marine fringe. And, many of the attributes that determine desirable recreation settings along the protected shorelines are also desirable for activities associated with timber harvesting, such as log storage and transportation (Faris and Vaughan 1985).

An on-the-ground inventory of potential recreation sites would be a formidable, costly task. However, knowing the extent and location of such sites, particularly those that represent "critical recreation habitat" for regional communities, is important for specifying impacts, for identifying alternative opportunities and possible substitutes, and for developing appropriate management and mitigation strategies when important opportunities will be affected.

Information on the identification of attributes and their importance comes from managers' judgments and from research about user choices, preferences, needs, and expectations. A survey of Alaska residents in 1979-80, the Alaska Public Survey (APS) (Clark and others 1982), revealed the following attributes of favorite sites: remoteness; beaches (and other land characteristics); good boat access and moorage; good saltwater fishing; good beachcombing, hiking, and walking; wildlife and birds; undisturbed natural area; places to get away from others; and scenery.

Based on these user-defined qualities and on field study of some sites residents identified on maps, other attributes can be determined as essential (requisite attributes) for use of certain settings. For example, the need for access to the coastline and protection from winds and waves has lead to the identification of the following requisite attributes in coastal areas:

- Landslope--allows easy upland activities (steep ground does not).
- Tidal area--smaller areas facilitate access to beach and uplands.
- Bathoslope--submarine slopes and characteristics affect anchoring ability.
- Shoal--offshore rocks and reefs impede boat access to the shore.
- Exposure--protection from winds and waves is a fundamental need.

Many other attributes potentially enhance or limit access to and use of the coastal margin. These include forest cover (provides privacy and protection), currents, beach type, and distance from home (fig. 3).

A key feature of the attributes identified above is that they are objective indicators and can be identified and measured from information commonly available in forest management offices. This provides a less expensive and less time consuming alternative than field inventory. By measuring the presence and variation in these attributes on maps and aerial photos, the location of potential key recreation sites can be deteermined. A probable estimate can be developed of the proportion of the region's 26,000 miles of tidal shoreline that represents a usable opportunity for dispersed recreation along coastal areas.

Onsite verification of these indicators will provide a measure of the reliability of estimates derived from maps and aerial photos. It will also refine the measures of access and suitability for recreation use. Onsite inventories also yield measures of actual site usage. How well do the estimates based on state-of-the-art knowledge represent actual user choices and preferences?

The attributes described above were measured and mapped in a pilot test along more than 80 miles of shoreline. Application of the attributes leads to the elimination of most (approximately 80 percent) of the coastline as potential "critical sites" (those with all the necessary requisite attributes for boat access and upland camping). A caution is in order here. The "surviving coastline" (the remaining 20 percent) represents potential sites based on the rationale described earlier; those sites are effective or usable for offshore access, they may or may not actually be used. This is a situation similar to the coincidence (or lack of it) between wildlife habitat and the actual occurrence of animal populations--they may or may not be found in areas of good habitat. In addition, the "eliminated coastline" may have

Figure 3.--The amount of exposed tidal area can restrict or facilitate access to beaches and uplands.

important recreation or scenic values for some types of activities and some users. Even in the worst case, where access by boat is impossible, the scenic value alone may be important for either onshore or offshore visitors to the area. However, identifying and mapping key site attributes helps to sort out the complex interactions among diverse recreation activities and potential recreation settings.

Each of the surviving sites should be considered as particularly important (or key or critical) in that they provide protection and generally unrestricted access from offshore to the uplands with some degree of flat terrain. In essence, these sites illustrate the concept of "effective recreation opportunities;" opportunities that are usable either because of their location vis a vis communities or because of physical conditions at the sites. The surviving sites in the pilot study are effective in terms of physical conditions; further application of the attributes approach in a larger area and analysis is necessary to determine the role of surviving sites in providing options for residents of nearby communities. Additional information about locational, macroarea, and microarea characteristics will help determine the significance of each of the potential sites identified.

A major advantage of the approach described is that standards for each of the attributes can be adjusted as appropriate. For example, if it is felt that too steep a bathoslope, or too small (or large) a tidal area were being considered, that could be adjusted and the section of coastline reevaluated. In this way more or less coastline would survive. Of course, such a change in standards would have to be based on a rationale consistent with user preferences and choices.

Although the preliminary focus of this study has been on the coastal margin, the concepts can be applied to recreational opportunities in upland areas. For example, while bathoslope and tidal area are potential impediments for boat access, they are largely irrelevant for upland access; flat ground and a nice beach may be desirable in either case. Other attributes beyond those described earlier must be determined for upland environments. The data resulting from the process described above then can be used to evaluate the importance of sites whether in upland or coastal areas.

CONCLUSIONS

Our research indicates that enhancing opportunities for recreation, or mitigating the effects of timber management on recreation both within and outside of wilderness, is certainly possible. Outside of areas classified as wilderness, the situation is not necessarily an either-or proposition, but more one of how to harvest while protecting key recreation values, if in fact, recreation is a use for which managers need to provide diverse opportunities. The results from this research will lead to a process

to help identify where critical areas are so that they can be considered as part of ongoing planning and management. The results also will help define what features of timber management activity are particularly important to recreationists.

The results of this research and their use in management may help to depolarize the debate about whether to log or not to log in certain areas. Studies in the Pacific Northwest demonstrate that there are important recreation values in multiple-use forests, and studies in Alaska suggest that the same might be true in some places and for some users. As indicated in a recent publication about recreation in multiple-use forests in Oregon and Washington (Clark and others 1984), "the observations and findings from this research should not be construed as an excuse to log previously unlogged areas. Rather, the results of our work indicate that when a decision is made to harvest timber for commodity values, it may also be possible to provide some quality recreation opportunities in such areas. There may also be situations, however, where silvicultural alternatives should be considered expressly for recreation, rather than production of commodities. Management objectives guide such decisions."

To make such an approach work requires that critical recreation sites be identified and their attributes measured in advance of any on-the-ground activity. In this regard, recreation is little different from fish and wildlife management; knowledge of critical habitat is fundamental in each case. With such information, it will be possible to test alternative timing, spacing, and design options for their ability to protect key recreation opportunities in areas intensively managed for timber production.

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