RECREATIONAL GEOGRAPHY:

Its Evolution And Application To

Problems of Wilderness Management

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Recreational Geography: Its Evolution and Application to Problems of Wilderness Management

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As one reviews the various themes of geography's rich history, concern with the relationship of people to their environment is central. Historically, the study of mankind as related to environment has dominated the discipline, and geographers from Ratzel to Sauer to Tuan have focused their attention on this relationship (Hewitt and Hare 1973, p. 1). The result has been a diversity of alternative, often conflicting perspectives yet one joined by a common interest in how society perceives, behaves within, and utilizes its surroundings. It is somewhat ironic, then, that at a time when the holistic perspective required for the study of society and environment was most crucial, geography, in its anxiousness to cast off the disreputable theories of environmental determinism, nearly rejected the continued study of environmental influences on human behavior.

Today we seem to be regaining a more balanced perspective about the relationship between society and environment. Simple notions of causation have been replaced by more realistic theories of complex interaction and influence between human behavior and the physical environment. In particular, we see an increasing emphasis on understanding how and why people perceive the environment as they do and how these perceptions, whether grounded in reality or myth, alter the pattern of occupance and use of that environment. For example, the substantive body of knowledge concerning the perception of natural hazards is replete with cases of how the image of landscapes, as modified by the cognitive processes within the beholder, influences human settlement.

Within the broad domain of man-environment studies there has been increasing interest in the study of landscape as a setting for man's leisure-time behavior. Geographic interest in this sphere of human activity is probably a result of many things, but it is almost certainly related to the magnitude of impact associated with leisure and, more specifically, outdoor recreation activity. Whether considered as a land use, economic activity, or component of human behavior, outdoor recreation has grown substantially in the past three decades. Increases in mobility, education level, discretionary income, and leisure time have all been cited as factors influencing the rise in outdoor recreation participation (Clawson

and Knetsch 1966). There has also been a heightened appreciation of the environment as a source of recreation, scenic, and amenity values (for example, see Ullman 1954). As a result of these and other factors, outdoor recreation has taken on the accoutrements of many other activities that merit the attention of geographers: governmental institutions that promote its development (Bureau of Outdoor Recreation); formal funding programs (Land and Water Conservation Fund); university and special educational programs to train experts; specialized literature *(Journal of Leisure Research);* and a host of citizen and professional groups to promote special interests within the outdoor recreation sphere (National Recreation and Park Association, Sierra Club). In a very real sense, outdoor recreation has acquired an aura of legitimacy. Of particular interest with regard to the focus of this paper, outdoor recreation has become an increasingly significant focus for geographers. But this has not always been the case, and it is perhaps instructive to review briefly the origins of recreational geography and the evolution to its present status.

RECREATIONAL GEOGRAPHY: A REVIEW

Systematic investigations of recreation as a phenomena for geographic study largely originated in the 1930s. The work was descriptive and often concerned with the economic significance of recreation. For example, Brown's (1935) review of recreational geography primarily addressed the issue of tourism and called for increased attention by geographers to the economic consequence of tourism development. Studies by McMurry (1930), Prophet (1936), Greeley (1942), and Deasy (1949) were important contributions to our increased understanding of the recreational character of various settings. The nature of the research on recreation retained its economic orientation throughout the 1940s and 50s, with the exception of such work as Booth's (1948) analyzing the characteristics of recreational resources in eastern Washington and Wolfe's (1951) study investigating the origins of second-home owners. But the general flavor of recreational geography prior to the 1960s was an economic one, and this is clearly reflected in the description of the status of recreational geography as outlined in *American Geography: Inventory and Prospect* (1954), in which it was positioned as a subcomponent of economic geography. Empirically it was a justifiable placement, both because most of the literature dealt with the economic dimensions of recreation and, as Murphy (1963, p. 33) noted, because recreation was one of the major economic activity sectors in many states and countries.

The relatively narrow focus of recreational geography, particularly the traditional emphasis on the economic dimensions of recreation, was criticized in a comprehensive review of the field by Wolfe in 1964. Wolfe also took exception to what he saw as the generally inadequate amount of scholarly attention given recreation. The burgeoning growth of recreation and its consequent impact on communities, resources, and people necessitated an increasingly sophisticated

level of attention from geographers. Wolfe strongly supported Murphy's (1963, pp. 33-34) earlier call for an accelerated program of research, both in the universities and in the various governmental bodies with responsibilities for the management of recreation resources.

It is not easy to determine the extent to which geography has responded to the need for research on outdoor recreation. For example, an examination of professional geographic literature shows that studies of outdoor recreation comprise a very small proportion of the total articles published. In Table 1, the number of articles dealing specifically with recreation between 1965 and 1976 from the *Annals, Professional Geographer, Geographical Review,* and *Canadian Geographer* are presented.

Clearly, the topic of outdoor recreation has been limited in the professional geographic literature. At the same time, it would be incorrect to conclude that a lack of interest or participation exists on the part of geographers in the outdoor recreation field. This conclusion is supported by the following.

First, Table 1 shows only those articles specifically focused on outdoor recreation or tourism. There are many other articles in which outdoor recreation is discussed. For instance, Steiner's (1966) analysis of available public land in southern California has direct implications for the recreation geographer as do Lowenthal's (1968) fascinating discussion of landscape quality in the United States and Pryde's (1976) analysis of landscape conservation zones around residential areas.

Table 1—NUMBER OF RECREATION-RELATED ARTICLES IN SELECTED GEOGRAPHICAL JOURNALS, 1965-1976

Annals	Professional Geographer	Geographical Review	Canadian Geographer
3	5	5	6

Source: Based on listings from table of contents.
*Covers issues only from 1966 to 1976.

Second, a number of useful literature reviews dealing with man-environment relationships have been published in the past decade. Many of these cite important work on outdoor recreation, either done by other geographers or of direct interest to geographers. Significant reviews that merit attention are those by Chappelle and Andress (1967), Tuan (1972) and Svart (1976).

Third, outdoor recreation continues to be a major research focus for some faculty and graduate students. Early assessments of geographical interest in outdoor recreation noted the relatively high level of investigation given outdoor recreation by graduate students (Briere 1962 and Wolfe 1964), and this situation appears still to be the case. A recent bibliography of theses and dissertations on recreational geography by Travis (1972) lists more than 200 entries from

American and Canadian universities. A review of theses and dissertations listed in the annual compilation published in *The Professional Geographer* includes 145 titles, about 3 percent of the total. As noted above, however, many other theses and dissertations probably contain discussions of recreational geography that are not reflected in their titles.

It is also apparent from a review of theses and dissertations that recreation geography has been substantially "liberated from the thralldom of economic geography" that Wolfe called for in 1964. As Table 2 indicates, a diverse range of subjects now command attention from recreational geographers, with economic orientations relegated to a minor role.

Table 2—MAJOR THEMES IN THESES AND DISSERTATIONS IN RECREATIONAL GEOGRAPHY, 1971-1976.

Subject	Number of Theses and Dissertations (%)
Development of recreation resource inventory systems	22 (15%)
Perception of recreation landscapes	21 (15%)
Analysis of recreationists' spatial behavior	44 (31%)
Investigations of physical-biological impact	10 (7%)
Economic impact of recreation	8 (6%)
Tourism	14 (10%)
Other miscellaneous topics	23 (16%)

Source: Annual lists of theses and dissertations, *Professional Geographer*, 1971-1976.

Geographers also have played an important role in helping identify recreation as a significant research area for scientific investigation. Several specific research areas for geographic investigation are identified in the National Academy of Sciences report *A Program for Outdoor Recreation Research* (1969), largely because of input from such people as Edward Ackerman and Roy Wolfe.

Many geographers claim recreation as a major research interest. The editorial board of the *Journal of Leisure Research* and the newly published *Leisure Sciences* both include geographers, commonly more than one. In the 1974 Directory of AAG Members, more than 300 members listed recreational geography as one of their three specialty areas. Interest in the field is sufficient to warrant publication of a newsletter, *Recreation, Tourism and Sport.*

Finally, we must recognize that much of the contribution of geographers to recreation management, planning, and research is not evident in the professional geographic literature. The reasons for this would seem to relate closely to the general focus of this volume; that is, much of the geographer's involvement in outdoor recreation has an applied aspect to it that has been reported in literature other than the professional geographic outlets, if published at all. For example,

the *Journal of Leisure Research* has provided a professional forum for the study of leisure behavior that many geographers have utilized. Since publication began in 1969, slightly over 10 percent of the articles have been authored or coauthored by geographers, a significant figure given the number of disciplines involved in recreation research. Other outlets, such as agricultural experiment station reports, government publications, reports to contracting agencies, and unpublished reports must be searched in order accurately to assess geographic involvement in outdoor recreation management, planning, and research.

The growing involvement of geographers in outdoor recreation is further reflected by the recent publication of two books on the geography of recreation: Cosgrove and Jackson's *The Geography of Recreation and Leisure* (1972) and Lavery's *Recreational Geography* (1974). Although both draw heavily from research and management experience in the United Kingdom, North American examples are given and further illustrate the breadth of geographic involvement in recreation. Recreational geography has enjoyed an important role in Europe (Wolfe 1964, p. 226) as well as Canada, more so, it seems to me, than in the United States.

Geographers have established themselves in the outdoor recreation management and research field in a number of ways. University research reflects only part of the total level of involvement by geographers. The application of geographic theories, methods, and concepts in recreation management, planning, and research is probably used most frequently by individuals holding baccalaureate or master's degrees in geography and employed at federal, state, or local governmental levels. The generally depressed nature of the job market over the past five years has probably limited the geographer's role. But important work on applied recreational geography has been done. For example, geographers played a major part in the preparation of portions of the landmark Outdoor Recreation Resource Review Commission reports. Geographers continue to make significant contributions in organizations such as the Bureau of Outdoor Recreation, National Park Service, state park and recreation departments, and local government recreation offices. While a complete inventory of work by geographers is not possible to compile at this time, a few selected examples will illustrate some of their important contributions.

The inventory and classification of recreation resources is an issue that a number of geographers have examined. Knowledge about the amount, characteristic, and potential of resource systems for alternative uses, including recreation, is a major need for decision makers today. It is often one of the major information deficiencies, however. In Minnesota an impressive series of studies prepared under the direction of geographers has provided state authorities with a comprehensive quantitative profile of the state's recreation potential. For example, an analysis of developable land in northern Minnesota identified the existence of more than 300,000 acres of privately owned land near the newly created Voyageur's National Park and provided an assessment of potential impacts on

these lands stemming from park development (Rusch, Borchert, and Orning 1972).

The spatial behavior of recreationists and their use patterns at recreational sites are other subjects geographers have examined. The former has drawn considerable sophisticated analysis. In Canada Wolfe (1967) developed a theoretical framework to predict and describe recreational traffic behavior along rural highways. Analyses of recreational demand in Michigan, using various travel models, have also drawn the attention of geographers (Milstein and Reid 1966). At the micro-scale, Lime (1971, 1972) investigaged how recreationists' perceptions influenced their choices of campgrounds in the Superior National Forest. Campground occupancy rates varied from in excess of 100 percent to 12 percent on a seasonal basis, and the basic question addressed concerned the reasons for the extraordinarily skewed use distributions. Factors such as available opportunities, knowledge of alternatives, level of use, and campground size affected the decisions of users. Perhaps the fact that visitors perceived recreational environments quite differently than did recreation managers is of major significance. Desirable locations, as defined by managers, were quite different from sites judged high in quality by managers. This finding coincides closely with studies by Lucas (1964) concerning visitor perceptions of wilderness and with user assessments of desirable campground characteristics contrasted with managerial judgments (Lucas 1970). For instance, Lucas (1970, p. 9-10) found that two-thirds of the visitors rated beach quality and overall site quality higher than did managers, while two-thirds rated fishing quality as lower than did managers. The implication seems clear that the differential perception of resource quality makes quasi-objective quality ratings of doubtful utility. Measures founded on objective, straightforward accounts of resource conditions (yards of beach, acres of tree cover, and so forth) seem much more useful (Orning and Maki 1972, p. 57).

Applications of physical geography to problems of recreation management can also be cited. It is the composition and diversity of physical-biological elements that give most areas their recreation potential; and, in turn, resulting patterns, densities, and styles of recreation use alter those physical resources in ways that are of interest and concern to geographers as well as resource managers. Studies by Dykema (1971) of the spatial patterns of ecological impact resulting from camping in the southern Sierra Nevada revealed several important relationships between use and impact. For example, she found important variations in the nature and level of observed impacts between the various life zones in the southern Sierra. Also, the varying sensitivity of life zones to camper impact apparently accounted for the lack of association between impact and accessibility, with those life zones most accessible to use also the most resistant to impact. She also documented that impact was highly variable within individual camps, with certain features such as attractions, camp entrances, and restrooms receiving most of the impact. The implications of such a finding for campground design seem clear.

The potential contribution of geographic perspectives and techniques to recreation problems is great. To focus more specifically on some examples of application, the remainder of this paper will describe some of the geographic analyses done on the recreation use of wilderness and other dispersed recreation settings.

GEOGRAPHIC ANALYSES OF WILDERNESS RECREATION USE

The U.S. Forest Service supports a program of recreation research across the country. Currently it is staffed by about eighteen scientists, five of whom are geographers. The program is organized on a topical basis, with each of the nine units responsible for a particular problem area. For example, the unit at Missoula, Montana, staffed by Bob Lucas (a University of Minnesota Ph.D. in geography) and myself, has the responsibility for research on recreation use of wilderness and other undeveloped lands. This mission is nationwide, and not restricted to lands administered only by the U.S. Forest Service.

"Wilderness" is a term with many meanings (Nash 1973), but since 1964, when the Wilderness Act (PL 88-577) passed, it has acquired a relatively precise legal definition. Such lands are to be undeveloped, representative examples of pristine ecosystems, lands where, as the poetic phrasing of the Act notes, "the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain." The National Wilderness Preservation System created by the Wilderness Act contains land administered by the U.S. Forest Service, National Park Service, and Fish and Wildlife Service; and as a result of legislation passed in 1976, it will soon contain lands of the Bureau of Land Management. Currently 14.4 million acres are in the System, but only about 12 percent of this acreage is located east of the 100th meridian.

Our program of wilderness research centers on three general problem areas, each with a definite geographic thrust. First, we are concerned with developing an accurate picture of use: how much, what kinds, its distribution within and among areas, and how it is changing. Second, we are studying how variations in resource and use conditions affect the quality of experiences people derive from visiting wilderness. Here, there is interest in how such things as use levels affect perceived satisfaction and travel patterns. Third, and a much more specific issue, we have initiated studies on how use distributions can be modified. The role of external access, interior trail systems, and management actions (for example, providing visitors with information) are involved in this research.

The research programs also have dealt with other studies (for example, economic analyses of the opportunity costs of wilderness designation, citizen participation in decision making, water-quality studies), but the three categories described previously represent the major components of our program. A number of specific studies have been conducted within these broad problem areas.

Problems of Use Measurement

One of the major problems affecting recreation studies has been the lack of accurate data about the recreation phenomenon (Wolfe 1964). Even though a substantial amount of work has been done on the issue, it still remains a major handicap. This is particularly true in wilderness where use is widely dispersed, of low intensity, and highly mobile. Information about use typically has been obtained through such techniques as trail registers, but they have not been particularly successful. At best, they might obtain 60-70 percent registration, but studies (Lucas 1975) indicate that these rates can drop below 30 percent. Moreover, there are systematic differences in the rates at which different kinds of users register (hikers versus horseback groups, day use versus overnight) (Lucas, Schroeder, and James 1971). Thus, the baseline data fundamental to many management decisions and research questions are simply lacking.

Understanding use distributions is, as one might expect from the above discussion, extremely difficult. But some relatively clear facts are emerging. For instance, use distributions, at access points, within areas, and between areas are highly skewed. For example, in the Boundary Waters Canoe Area in northern Minnesota, 10 percent of the area's access points receive 70 percent of the use. This pattern has been found in all areas studied to date.

Internal distributions are also highly skewed. For example, we have developed a measure of use concentration to reflect the relative share of use that a given proportion of trail mileage carries. What we find is that small percentages of trail mileage receive the preponderant share of use. In the Spanish Peaks Primitive Area in Montana, only 10 percent of the trail system accounts for 52 percent of all use; in many other areas, the percentage of use is even higher (Lucas 1974, p. 11). In the Boundary Waters Canoe Area visitors to some lakes encountered more than forty times as many groups during the same time period as did visitors to other areas only a portage or two away (Stankey, Lucas, and Lime 1976, p. 40).

At the macro-scale, the same uneven distribution can be found. For the National Wilderness Preservation System as a whole, use intensities vary enormously, from more than four visitor-days per acre to only .01 visitor-days per acre (a visitor-day is an aggregate stay of twelve hours by an individual).

This uneven distribution leads to a number of important management questions. Problems of congestion are increased, resource impacts are often accentuated, and the kinds of objectives set forth for wilderness are seriously threatened. However, simply knowing the pattern of these distributions is a basic first step to implementing management programs and research activities that might eventually alleviate such problems.

Measuring Wilderness Use Capacity

The issue of recreational carrying capacity has been of interest to geographers for some time (for example, see Chubb 1964; Lucas 1964; and Tivy 1972). The

subject has two relatively distinct components: (1) physical-biological capacity and (2) social-psychological capacity. The latter emphasis is a sub-issue of the broader geographic concern with understanding how perception alters the use of the environment, and most of our work has dealt with this aspect of capacity as opposed to studies of physical-biological capacity, although other geographers are examining this aspect of carrying capacity (Cole 1977).

Our studies have revealed a number of important aspects of the capacity question. Visitor responses suggest a preference for relatively low contact levels and the existence of significant conflicts based on differing travel methods, party sizes, and behavior perceived as inappropriate. There are significant variations in the extent to which contact with other groups cause a loss in satisfaction, however, depending on where the contacts occur. For example, most visitors perceive that the wilderness is composed of at least two macro-zones—a peripheral zone where contact levels are to be anticipated and an interior zone, where use intensities should be low. In the peripheral zone, visitor anticipation of higher interparty contact results in a degree of tolerance to conditions that are perceived as crowded in the interior zone (Stankey 1973).

There is also a micro-scale spatial component to the capacity problem. In areas of overnight camping (for example, along lake shores) visitor desires for some degree of isolation and solitude result in an expressed preference for camping out of sight and sound of others. Thus, density levels that are low enough generally to allow visitors to find campsites apart from others seem important to maintain. We have also found that visitor reaction to encounter varies within the interior depending on whether the contacts occur along trails or at campsites.

Problems of Modifying Use Distributions

Our third problem area concerns developing techniques and methods whereby current use distributions might be altered so as to achieve more even distributions. As discussed above, virtually all areas studied have been characterized by intense concentrations of use in a relatively few areas. As a result, problems of congestion and crowding are intensified as are problems of resource degradation. When considered in the context of an area where the management objectives call for maintenance of qualities such as solitude and naturalness, these problems become particularly severe. While it would be possible to gain some control over these problems through such techniques as rationing (as has been done in a few locations) or direct control of users (prescribing where to go, when to camp, how long to stay), we believe less regimenting measures might be instituted that could achieve the same results. Certainly one possible action is achieving more even use distributions. But how?

One apparent solution lies in providing visitors with more accurate information about the wilderness—about travel conditions, attractions, use levels, and alternative opportunities. For example, in one study currently being completed, we

provided visitors with a brochure describing one portion of the Selway-Bitterroot Wilderness in Montana. The brochure contains a map of the area with information on how to reach alternative trailheads (a particular problem here because of private land along the wilderness boundary), areas of forage for recreational livestock, trail conditions, and so forth. In addition, based on information about the previous year's use, we prepared a bar graph showing the relative proportion of users entering the area through the various trailheads. Thus, people concerned with solitude have an opportunity to select an entry point where use might be lower. Although this study has not yet been completed, tentative analysis suggests some positive effects on visitor behavior. One important finding already discovered is that information must reach people early in the planning stages to affect their decision of where to go.

The use distribution problem may be analyzed by computer simulation. Cooperative work between ourselves, Resources for the Future, Inc., and IBM has resulted in development of an operational wilderness travel simulation model. The model allows for quite realistic simulation of actual wilderness travel behavior. For example, it permits simulating variation in use level, route of travel, party size, method of travel, entry point, and several other aspects of travel behavior. It records encounter levels on a fairly site-specific basis and allows managers and researchers to review the consequences of alternative management actions prior to implementation of a policy. Because information on use distributions and amount and type of use is given, potential physical-biological impacts can also be anticipated and reviewed concerning their acceptability.

Data for development of the model was acquired largely from map-diaries provided visitors in the Desolation Wilderness in California. These provided information on where people went, length of time required to travel certain trail segments, places people stopped to view attractions or campsites, and so forth. These data were in turn field checked. Simulation runs of the "base case" or the period for which data were collected revealed a fairly high level of similarity between simulated conditions and self-report measures in such things as level of use contacted. Discussions of the general properties of the model can be found in Lucas and Shecter (1976); the theoretical aspects of the model are described in Smith and Krutilla (1976); and the computer program and program directions are in Shecter (1975).

CONCLUSION

It seems clear that geography is relevant to the fields of outdoor recreation management, planning, and research. The movement of people over space in search of recreation; their perception and use of recreational resources; and the various physical, biological, economic, and social impacts associated with use of resources all represent problem areas to which geographer can apply their skills.

It has been our experience that recreation administrators, managers, and planners are interested in what geography has to offer. Although it is often diffi-

cult to trace the impacts of research on policy formulation, it is clear that studies by ourselves and others have gradually affected various outdoor recreation policies and programs. For example, the wilderness travel simulation was used to test a series of potential management alternatives in the Desolation Wilderness, and decisions regarding trail development and appropriate use levels were founded on the results. As another example, the documented impact of large party size on both resources and experiences established in studies of how visitors perceive the wilderness resource has led to a general limiting of party size by resource managers and private organizations.

In applied geography a major focus ought to be on the development of information of direct policy relevance. Research should involve problems that are important to decision makers. It should be recognized that the analysis of policy variables and the investigation of priority problems within realistic frameworks are most useful to those people in our society charged with decision-making authority (Morrison 1966). Geography, with its regional perspective; its interest in social, economic, and physical phenomena in space; and its integrating style of analysis seems particularly well suited to providing this type of assistance.

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add to 42

ERRATA

Page viii: line 3 should read "...Emily Palmer..."
line 5 should read "to all who read galley proofs..."

Page 10, paragraph 3: line 2 should be deleted; first sentence in paragraph should read "As a result of the regional development trends, more and more high value-added and capital intensive firms will decide in the future to locate plants in the South."

Page 18, last paragraph: line 6 should read "...available within a city..."

Page 24: entry 12 in references should read "Cox, K. R. and R. Golledge..."

Page 31, last paragraph: line 5 should read "...may have been created..."

Page 36: 8th line from end of page should read "recorder of deeds or Lusk's..."

Page 56, paragraph 3: line 5 should read "journal entitled *Landscape...*"

Page 80, paragraph 2: line 7 should read "...Lime (1971, 1972) investigated..."

Page 84, paragraph 4: line 5 should read "...areas to which geographers can..."

Page 90, paragraph 2: line 11 should read "resulted in the Tennessee Valley landscape alterations and plans. Another..."

Page 110: entry 16 in references should read "Penman, H. L. *Vegetation and Hydrology...*"

Page 127, section on "Urbanization": line 6 should read "population of the United States and is greater than the total population of Japan. China alone..."

Page 129: line 1 should read "...exists today in the economic"

Page 142: entry 5 in references should read "Marble, Duane F. *Some Computer Programs for Geographic Research...*"

Page 147, paragraph 2: line 12 should read "classes each. Map 6 of the..."

Page 158: caption on figure should read "Figure 2"

Page 159: caption on figure should read "Figure 1"

Page 161, note 2, paragraph 2 should read: Along similar lines...term model "has become very fashionable.... As Brodbeck [1959, 373] has pointed out, model-building has a kind of 'halo effect' upon the research worker since 'Models are Good Things'.... The general confusion...geographic research...."