Biocentricity in Wilderness Management

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INTRODUCTION

With the passage of the Wilderness Act in 1964, Congress established a means whereby certain areas could be preserved in their natural condition to provide "the benefits of an enduring resource of wilderness" (P.L. 88-577). The Act provides relatively clear guidelines for wilderness classification (primarily a political decision) but deals with the critical issue of wilderness management in only a general, often implicit fashion. Only broad guidelines are provided; many fundamental issues, such as control of wildfire, are left unresolved.

To date, much of the attention of managing agencies and conservationists has focused on wilderness classification. We are concerned, however, that wilderness *classification* has been treated too often as an end in itself, without proper attention to wilderness *management*. Criteria are needed to guide the management of wilderness so that preservation objectives of the Wilderness Act can be met.

A variety of management issues confront wilderness administrators. In some areas, even limited recreational use has resulted in severe impacts on sensitive alpine meadows (Arno 1971). Water quality in remote backcountry areas is increasingly subjected to pollution from human and stock wastes (Barton 1969). Because of five decades of efficient fire protection, vegetational patterns in wilderness have been altered and the goal of naturalness compromised (Heinselman 1970). Concurrent with these changes in the biological realm are similar impacts on the recreational experience provided users. Use continues to grow between 10 and 25 percent a year (Frissell and Stankey 1972). In some southern California wildernesses, literally hundreds of parties can be counted along the trail. Many lakes are ringed by campsites that make opportunities for solitude impossible. The way these problems are dealt with will reflect the philosophy that explicitly or implicitly underlies the policies of different managing agencies. In this paper we identify two contrasting philosophies—anthropocentric versus biocentric—and discuss some of their theoretical, empirical, and practical implications. The following paper is both an evaluation of the contrasting philosophies and a supporting rationale for the biocentric approach to wilderness management.

The first of the contrasting philosophies about wilderness management we label "anthropocentric"; i.e., man's use of wilderness is the primary objective. The goal of maintaining the integrity of the natural environment, although important, is secondary to enhancing and providing opportunities for recreational and other human uses in a primitive setting. Management would seek to enhance those aspects of wilderness that are pleasing to man, with sociological and cultural definitions taking precedence over biological concepts (Spurr 1966, Cowan 1968). Under an anthropocentric philosophy, the overriding effect would be an adaptation to and facilitation of increasing recreational and other human use of wilderness. Examples include proposals for "wilderness enclaves"[1] and a variety of management actions such as campsite developments, stock control devices, high standard trails, and elevated board walks across meadows, designed to increase recreational carrying capacities of a wilderness as an alternative to rationing use (Snyder 1966).

Conversely, the "biocentric" philosophy would emphasize natural integrity of wilderness ecosystems at the expense of recreational and other human use, if necessary. However, the biocentric philosophy we propose does not pursue preservation for its own sake. Rather, it seeks to maintain, to the maximum extent possible, the natural processes of environmental change and posits that because of the values (recreational, scientific, vicarious) placed on the preservation of these processes, certain important benefits will accrue to society. Thus, the term "biocentric" is somewhat misleading, for the focus of this philosophy, like that of the anthropocentric, is on man; the difference lies in the degree to which the benefits of wilderness are viewed as being dependent on maintaining the natural integrity of wilderness ecosystems.

Conflict between these two philosophies is emerging as different agencies attempt to formulate policy reconciling the fairly wide range of interpretations surrounding the preservation and use objectives of the Wilderness Act. The anthropocentric-biocentric dichotomy becomes especially apparent when talking with any group of wilderness managers or in reviewing their proposed management plans for different wildernesses.

THE CONCEPT OF BIOCENTRISM

The goal of biocentrism is to maintain at least approximately natural energy flows within a wilderness ecosystem (Houston 1971). Human influence should not be allowed to alter significantly this flow, either through introduced energy (such as from excessive recreational use) or by restricting energy flows (such as has occurred from efficient fire prevention and suppression). Thus, the biocentric criteria for manage-

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[1] For example, wilderness proposals for Yellowstone National Park and the North Cascades National Park recommended excluding parcels of land to permit the retention of certain management, research, and resource protection-related structures. See Wilderness Study—Yellowstone National Park, 1971, and Wilderness Proposal—North Cascades National Park, 1970.

ment intervention would be the presence of an energy imbalance leading to unacceptable change within the wilderness ecosystem[2] (as opposed to the human preference criteria of the anthropocentric approach). Ecosystems vary in their ability to resist change under given energy imbalances. Alpine meadows, for instance, have little resistance to energy inputs compared with dense coniferous forests. This difference in resistance, then, provides latitude in the amount and type of management intervention that might be required within or among wildernesses.

OBJECTIONS TO BIOCENTRISM

The biocentric approach to wilderness management generally appears to characterize the position to which the U.S. Forest Service has evolved. A recent review of Forest Service wilderness policy concluded that purposive manipulation of the natural ecology to enhance human use was unacceptable and thus in contradiction of the long-term goals of the Wilderness Act.[3] However, this management posture, often labeled as the "pure approach" to management, has generated several criticisms. One of the most important is the charge that purity is a form of "passive aggressive" resistance by Federal agencies to discourage wilderness use and the classification of additional areas (Church 1972). Moreover, some conservationists charge that because neither the letter nor the intent of the Wilderness Act calls for the complete exclusion of facilities such as patrol cabins, helispots, or primitive shelters, agency resistance to such facilities is only an excuse to minimize the number of areas to be considered for wilderness classification (Church 1972).

These charges clearly reflect distrust by some conservationists for Federal Agency motives. However, we feel a biocentric philosophy can be applied to future wilderness management without necessarily precluding the classification of areas possessing limited evidence of past human activity. Moreover, many of the conservationist's preservation motives might be met through a formal program of protection for undeveloped backcountry recreation areas that did not satisfy wilderness classification standards.

Other arguments against a biocentric approach to wilderness management have been offered. The Comptroller General of the United States criticized the current pure approach of the U.S. Forest Service as inefficient and recommended that Congress modify the Wilderness Act to allow cost cutting modifications such as the use of power saws and motorized trail building equipment (General Accounting Office 1970). Some administrators, faced with heavy workloads and inadequate financing, understandably want to use labor-saving technology to carry out their wilderness management responsibilities (Snyder 1966). Wildernesses in which the natural integrity has been depreciated by overuse are offered as examples of the futility of a pure approach to their management (Fradkin 1971). Finally, a biocentric approach that would emphasize environmental preservation at the expense of use might be thought by some to have elitist overtones in that it would provide access to a privileged few at the expense of the majority (Hardin 1969, Julber 1972). However, this accusation of elitism will be true only if we fail to provide an adequate spectrum of alternative opportunities to meet the burgeoning demand for primitive (but non-wilderness) recreational use.

SUPPORT FOR BIOCENTRISM

In the foregoing, we defined alternative philosophies of wilderness management—anthropocentric versus biocentric—and reviewed some objections to the latter. Following, some evidence is reviewed in support of biocentrism.

Wilderness User Perspectives and Alternative Opportunities

Personal preferences for environmental experiences range from those tied intimately to pure wilderness to those satisfied in other outdoor environments. Over a wide range of study areas, study objectives, and research methodologies, researchers have consistently described a continuum of wilderness users, ranging from "purists" to those who are strongly convenience-oriented.

Wilderness users have been classified on the basis of prior camping experience (Burch and Wenger 1967), prior wilderness use (Outdoor Recreation Resources Review Commission 1962), method of travel (Lucas 1964), extent of travel into wilderness on a given trip (Merriam and Ammons 1967), and attitude scales (Hendee et al. 1968, Stankey 1971b). In particular, attitude studies indicate that, in contrast to convenience-oriented recreationists, "purists" have a more positive affinity for the pristine environment, a greater willingness to adapt themselves to primitive conditions, and an aversion to conveniences and obtrusive environmental manipulations. Such studies also indicate a considerable proportion of current wilderness users hold convenience-oriented preferences that can only be met by an anthropocentric approach to wilderness management.

Under an anthropocentric approach to wilderness management, increasing use pressures would be accommodated at the expense of environmental integrity. However, because some wilderness users' experience is inextricably tied to pristine, unaltered environments, an anthropocentric philosophy would eventually disenfranchise them as the stock of pure wilderness is eroded by decisions to accommodate increasing numbers of convenience-oriented recreationists. This would be particularly unfortunate because users seeking undiluted contact with truly pristine environments have the fewest alternatives available where they can enjoy such an opportunity. On the other hand, the less primitive a recreationist's preferences are, the more alternatives he has available (Harry, Hendee, and Stein 1972). Recreationists seeking only to hike or ride on a good trail, camp in a pleasant setting, or go on a group encampment with friends have, or should have, alternative locations available to them outside of wilderness. Recreationists seeking primitive challenge, adventure, or even perilous thrills from interacting with uncompromised nature would have no place to go if all pristine wilderness is modified to meet the needs of more convenience-oriented users.

Progressive Development of Primitive Recreation Preferences

The supply of wilderness is finite, yet recent increases in use suggest an almost infinite supply of potential users (Lucas

[2] For discussion of necessary levels of change before management intervention would occur, see Frissell and Stankey 1972.

[3] William A. Worf, C. Glen Jorgenson, and Robert C. Lucas. 1972. National Forest Wilderness—a Policy Review. Unpubl. report, USDA Forest Service, Washington, D.C. 56 p.

1966, 1971). Certainly, the availability of modern camping equipment that is light, durable, and of reasonable cost accounts for some of the increase. However, there is speculation, and some evidence, suggesting some outdoor recreationists, as they gain outdoor experience, develop increasingly primitive recreation preferences. For example, initiating more of the public to such forms of outdoor recreation as car camping might induce future demand for primitive opportunities (Krutilla 1967a). This speculation is supported by evidence that progressively more primitive camping styles are related to amount of childhood camping experience (Burch and Wenger 1967). Thus, some campers now visiting developed campground might ultimately seek more challenging experiences. If this is true, then the increase in demand for wilderness recreation can be expected to increase; both from users whose preferences shift on the developed-to-primitive recreation continuum, and from current wilderness users who, as a result of increased congestion, seek new settings where they can find their desired experiences.

These trends suggest serious problems ahead. Part of the solution will be found in preserving a diversity of opportunities to accommodate increasing preferences for primitive recreation as well as tastes for semi-wilderness.

Progressively Diluted Wilderness Conditions

Unfortunately, management efforts to contend with the growing recreational use problems described above can lead to unanticipated, progressive changes in the type of experience available. Traditionally, resource managers have responded to recreational use pressures with protective developments such as roads, trails, toilets, and traffic barriers to control use and preserve the environment. Thus, in locations once popular primarily because of natural environmental appeal, we now find highly developed campgrounds. Paradoxically, although development often seeks to protect natural environmental qualities, it often attracts a new clientele whose objectives are met, not by nature, but by the facilities, sociability, and other modifications of the setting (Hendee and Campbell 1969; Clark, Hendee, and Campbell 1971; Hendee and Harris 1970). The original "environmental" visitor might then find little left to attract him due to the invasion and succession of a new kind of use. Thus, management response to increasing use can change the character of experience available in settings once appealing for purely environmental reasons. The potential for this in wilderness is on the drawing boards–in some cases in plans for campsite improvements, upgraded and expanded trail systems, and the like. On more than one occasion, we have heard from responsible managers such comments as "We've seen signs of increasing use at Smith Lake and Jones Ridge. I guess we should build a better trail up there to take care of these users." Such response ignores the possibility that users sought out these areas precisely because of the minimum contact with people, trails, and other improvements they offered. Our point is that a biocentric philosophy would not artificially stimulate a change in the available character of wilderness experience.

Biocentrism Preserves Options

Wilderness is a finite resource. Although precise estimates of the amount of the resource available are impossible, the total potential wilderness is probably less than 3 percent of the contiguous United States (Stankey 1971a). Increasing problems of congestion in such areas as the Boundary Waters Canoe Area in Minnesota and some of the southern California wildernesses suggest there are no substitutes for these unique natural environments (Krutilla 1967b). For all practical purposes, the wilderness resource is an irreproducible "end good" because its benefits are nonsubstitutable (Reiner 1966).

However, while the supply sector is characterized by irreproducibility and nonsubstitutability, the demand sector shows steady increase and the potential for considerable further growth. A very possible outcome of these pressures might be a tendency for agencies to adopt management policies that satisfy the many rather than the few. Such decisions, *made one at a time* (Kahn 1966), could accumulate in a series of irreversible decisions. These would: (1) narrow the spectrum of available environmental opportunities by eliminating the kinds of areas (wilderness) already most deficient in supply; and (2) eliminate management options for these areas in the future.

Recent developments in economic theory recognize the value of maintaining options and define "option demand" as a willingness to pay for retaining the option to use an area or facility that would be difficult or impossible to replace and for which no close substitute is available (Cicchetti and Freeman 1971, Krutilla 1967b). Pristine wilderness is an irreproducible, relatively scarce resource without substitutes in terms of either the biological richness of these areas or their unique capability to provide special recreational experiences. Thus, such environments represent assets of appreciating value. Compromises in the purity of wilderness management tend to depreciate their value.

Moreover, as suggested earlier, management actions to accommodate less demanding wilderness tastes and preferences will only result in additional opportunities for users who already have the broadest range of alternatives from which to choose (Harry, Hendee, and Stein 1972). It is also important to recognize that the existence of unmodified pristine areas represents a significant "real income" or gain for many people. This includes not only wilderness visitors, but also those vicarious users for whom the knowledge that such areas exist is a source of personal satisfaction.

Purity in wilderness management also best serves the concept of "bequest motives" (Krutilla 1967b) – the desire of persons to leave estates, either in private or public goods. The dedication of private property for future use as public parks is one example of the bequest motive. To wilderness buffs, the assurance that future generations will have pristine environments to experience, either as visitors or only vicariously, is an important legacy best assured through a wilderness management philosophy that acknowledges the increasing value and future utility of such locations.

Biocentrism Facilitates a Uniform and Practical Policy

As outlined above, much theoretical and empriical evidence can be cited in support of a biocentric approach to

wilderness management. A final justification for this philosophy is its practicality (Costley 1972). The evolution of the biocentric approach to wilderness management by the U.S. Forest Service rests, in part, on experienced administrators' findings that the most consistent and defensible approach to wilderness management has been a pure one. Compromises, such as those involving the use of helicopters, chain saws, trail building machines, and shelters, although perhaps insignificant and easily rationalized in individual instances, would defeat the development of a consistent and defensible policy. For example, inspections against established criteria would be impossible, and decisions would be dependent on the subjective judgment of administrators whose views might vary widely. Likewise, cost cutting in wilderness management using laborsaving technology and development might ultimately depreciate the quality and integrity of the Wilderness System and, as a result, compromise the substantial opportunity costs incurred in its establishment.

DEBATE IS NEEDED

Now is the time for the issue of wilderness management philosophy to be debated in scientific, professional, and political circles. Both the biocentric and anthropocentric approaches have their advocates. Specific interpretations of legislative guidelines are progressing, but many basic management policies yet remain to be developed, applied, and tested.

Substantial unnatural changes in biological regimes can occur in a short time and the kind of experience afforded users can similarly rapidly shift. The scientific community can play an especially important role here by focusing pertinent research findings on policies and issues such as wildfire control. Patterns of use are not easily changed once established, and many changes in wilderness environments are essentially irreversible.

These and other complicated issues must be resolved before inaction or expedient decisions establish precedents. Undue delay in developing a deliberate philosophy to guide wilderness management decisions could be costly.

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