

Landscape Values in Public Decisions¹

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Abstract: The National Environmental Policy Act requires all agencies to develop techniques to insure appropriate consideration of all environmental amenities and values, including those presently unquantified, by all federal agencies in all their activities. These obviously include the values associated with the landscape and its visual resources. The visual resource, however, is inseparably intertwined with people's prior experiences and expectations, as well as nonvisual dimensions of experience; and its values include not only preferences but also cultural norms and ecological functions. Many valuable techniques have been developed for visual resource management, especially recent ones which move beyond traditional inventories of landscape characteristics and attempt to identify perceptual preferences; but much remains to be done. Comparative analysis of existing techniques in case studies would be fruitful, as well as more attention to (1) relationships between preferences, cultural norms and the landscape's ecological functions, (2) relationships between people's preferences and their knowledge and expectations of the landscape, (3) holistic approaches to landscape analysis and management, and (4) wider dissemination and use of existing methods within existing permissive statutes.

INTRODUCTION

Now can the values of the landscape as visual resource be integrated into public decisions? In some cases, the law provides a clear basis for analyzing and managing these values (Cerny 1974, Smardon 1978). In others, however, the law does not specifically cover all the landscape values that are at stake. In these cases, probably the great majority of

decisions, the administrator must somehow decide what to do about landscape values -- whether to invest in analyzing them, how to characterize and measure them, how heavily to weigh them in his decisions -- and how to justify those decisions. This paper, therefore, asks how the techniques of landscape researchers, both academic and applied, can meet the needs of landscape management decision processes.

There is, in fact, a statutory requirement which both permits and directs the treatment of landscape values, at least by federal administrators, in all their decisions. The National Environmental Policy Act^{3/} is best known for its requirement of detailed statements of environmental impact for all major federal actions that may significantly affect the quality of the human environment (Section 102L2) [C]). It is also known to some for its requirement that agencies

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^{3/} The National Environmental Policy Act of 1969, 42 U.S.C. 4321 et seq.

make integrated use of the natural and social sciences and the environmental design arts (Section 102[2] [A]); and for its substantive mandate, in Section 101(b), to "assure for all Americans...esthetically and culturally pleasing surroundings." Less well known, but equally explicit, is the clause which directly precedes the EIS requirement - Section 102[2] [B] - which states as follows:

To the fullest extent possible...
All agencies of the Federal Government shall...Identify methods and procedures, in consultation with the Council on Environmental Quality established by Title II of this Act, which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decision-making along with economic and technical considerations.

In ten years since NEPA was enacted, no agency has formally implemented this charge, although many do of course use some methods for considering some environmental amenities and values. Whatever any other law may say about particular aesthetic values, however, this one clearly authorizes agencies both to use and to develop techniques, to insure consideration of environmental amenities and values in their decisions, even - and especially - those that are often considered difficult to quantify, such as the values of the visual resource. It is applicable to all federal agencies; it is applicable to all their actions - unlike EIS's, not just "major" actions that may have "significant" impacts -; and most important, it extends to all environmental amenities and values, not just a few specific ones as in the Clean Air Act and Federal Water Pollution Control Act.

For the purposes of this paper, therefore, this statutory mandate also provides a useful frame of reference in which to consider how landscape analysis and management techniques can be applied to landscape management decisions. It requires answers to three questions:

1. What are the landscape amenities and values that should be considered?
2. What methods and techniques can be used to insure that these values are appropriately considered in decisions-- what is the present state of the art?
3. What improvements in technique do managers need developed that the state of the art is not now providing?

LANDSCAPE VALUES

What are landscape amenities and values?

One tradition of landscape research defines them by inventorying observable characteristics of the landscape, such as form, spatial definition, light, distance, observer position, and compositional type (Litton 1968), and then postulates aesthetic principles as to what relationships among these characteristics are considered most desirable (U.S. Forest Service 1973:2). These approaches typically assume that certain landscape values are commonly agreed upon, and identifiable, by the observation and judgment of experts.

Where the first tradition assumes value consensus and directs its attention to landscape inventory, the second, and more recent tradition focuses instead on the discovery of people's preferences. It starts from the premise that people's preferences differ - by class and culture, age, and experience, for instance - and that the expert may not know nor understand these differences without asking. This tradition therefore directs its attention to the landscape's observers, and seeks to identify - with their involvement and help - what the landscape's values and amenities are to them (e.g. Daniel and Boster 1976).

It is important to recognize, however, that the landscape's values include more than preferences (Andrews and Waits 1978). A landscape may be valued by an individual in the sense that s/he likes it, or likes it better than others - thus the study of values as preferences. But it may also be valued by a society or culture whether or not a particular individual or group prefers it. Landscapes protected by law are obvious examples - such as national parks and historic neighborhoods - because laws in principle express the society's enduring values, its norms, not just the preferences of individuals. Individually we might each prefer to discard our litter where we camp; collectively, however, we pass and generally respect laws to pack it out with us. Individual's preferences also are heavily influenced by culturally transmitted images and norms (Lee 1978, Tuan 1974). In this sense values include not only individual preferences, but also cultural expectations, which underlie and sometimes disagree with individual preferences, and are often far longer lived. The values associated with natural landscapes in America, for instance, may often be expressed through preference statements, but actually are embedded in deeper and much longer-lived, culturally transmitted, patterns of societal norms.

Finally, a landscape is valuable for what it does rather than just for how people feel about it - for its ecological functions as well as its appearance and cultural meaning. Wetlands, for instance, are a type of landscape that has

negative visual connotations for many people, and a negative set of cultural norms attached to it as well - useless swamps, mosquito breeding grounds, nuisance, waste lands, needing to be drained and put to productive use - yet this landscape also serves uniquely important ecological functions, such as purifying streams and producing fish and wildlife, whether or not humans fully recognize them. In such cases, appropriate management may require modification of our preferences and norms to fit the landscape's ecological values, rather than modification of the landscape to fit our inadequately informed preferences and norms.

The distinctions among these different meanings of "landscape values" -- preferences, norms, and ecological functions - are important to understanding how such values can be integrated into administrative decisions. The value of a forested hillside for timber production, for instance, can be only partially measured by asking people's preferences. Neither does this ecological or economic potential nor preferences alone necessarily capture all the relevant social norms for deciding whether it should be preserved or cut. Yet landscape managers often fail to make this distinction, and as a result ignore or misconstrue some of the landscape values that are affected by their decisions.

An anecdote will perhaps make the point even more clearly. In one state some years ago, a survey found strong consensus among people's perceptions of the state's most attractive natural river, a clear-running mountain brook. Biological analysis, however, revealed that the reason for its clarity was serious contamination by acid mine drainage, which had suppressed all biological life in it. For which of its values, therefore, should this stream landscape be managed - its visual attractiveness or its ecological health? Neither visual preferences nor ecological analysis alone provide the answer. What is needed is a deliberate information sharing process for resource decisionmaking, within which the relationships among preferences, norms, and ecological functions can be clearly developed and refined as a basis for decisions.

In short, the landscape has several sorts of values. All of these are intertwined with people's perceptions and preferences, and all need to be considered in landscape management decisions. But many of them cannot be discovered by looking at visual preferences alone. The values of the landscape as a whole, and even of the visual resource aspects of the landscape, include not only expressed preferences but also cultural norms and its ecological functions.

APPROPRIATE CONSIDERATION

What methods and techniques can be used to insure that these values are appropriately considered in landscape management decisions? In principle, appropriate consideration of landscape values has four rather specific criteria. First, such values must at least be explicitly identified, including not only individual preferences but also cultural norms and ecological functions of the landscape. Second, they must be expressed in terms of valid indicators, measurements, and inferences. Third, they must be meshed with the process of planning and decision-making, so that they serve not only to justify or mitigate choices already made, but also as points of comparison among alternative actions. And finally, they must be given appropriate weight - however that weight may be defined - relative to other considerations in the decision. To insure appropriate consideration, techniques are needed to fulfill all four of these criteria.

Preferences, Expectations, and Information

Present techniques heavily emphasize either the inventory of landscape features that match people's assumed preferences, or the identification of people's preferences for particular landscape characteristics (Cerny 1974, Anderson 1978). Some research has also been done on personality background factors affecting people's preferences (e.g. Craik 1969, McKechnie 1974); and a few researchers have begun to address the cultural bases for people's preferences, and the norms implied by group preferences (e.g., Anderson 1978). Others, however, ask only such questions as how much people would be willing to pay for a preserved (or altered) landscape, without ascertaining the cultural assumptions behind the answers; or they infer preferences from the observations of people's behavior without examining the sensitivity of that behavior to constraints (Andrews and Waits 1978). In agency practice, a landscape values study may often mean simply a crude survey of present users' likes and dislikes, ignoring normative assumptions and ecological functions (and often even the preferences of potential users).

There are also important questions even within the realm of preferences that today's techniques only begin to address. For example, people's preferences are shaped not only by their immediate perceptions, but also by their prior experience, knowledge, and expectations (Clay 1958, Kaplan 1978). Over ninety percent of Americans today live in urban rather than rural areas, and the vast majority of them is at least relatively ignorant of the processes going on in the landscapes seen - both the natural processes, such as hydrologic flows and ecological

communities, and the human processes of natural resource production, such as forestry and mining.

If vacationing suburbanites expect to see unbroken forest and instead see a clearcut, therefore, their initial perception is quite likely to be simply that it is ugly and intrusive (cf. Radar 1971, Schweitzer *et al.* 1976). Their perception of the forest, too, is unlikely to pick up many features that actually result from previous human activities - such as grassy clearings and brushy edges resulting from earlier logging. But would they respond in the same ways if they had more information to guide their expectations, such as interpretive materials on forest regeneration over time? They still might not always agree with the manager, particularly if the place had a particular symbolic meaning to them in its pristine condition. But at least their preferences would be based on a richer understanding of the relationship between their perceptions and preferences towards the landscape, on the one hand, and on the other, the landscape processes and functions that underlie what is seen.

Equally important, relatively little attention has so far been directed to landscape managers' perceptions and expectations of the resources they manage. Which of these are based on their knowledge of the landscape's functions, and which simply on their own personal preferences, or agency traditions, or clients' goals? Natural resource management professionals may understand many ecological and economic potentials of the landscape better than most laymen, but they also carry preferences and norms which may differ considerably from those of the general public. (O'Riordan 1971: 105-108; USEPA 1973b). They may be no less ignorant of the landscape values, needs, and expectations of urban populations than these populations are of the landscape; and they too, therefore, could benefit from better information to shape their expectations.

In short, there is both a serious need, and a valuable opportunity, to reduce the role of mismatched expectations in landscape management values conflicts. Sometimes it is the viewer's expectation of the landscape that is mismatched, based on inadequate experience or information; in these cases better preparation or interpretation by landscape managers might help. In other cases it may be the manager's expectations of the viewer that are mismatched; in these cases the manager may be the one who needs to learn and adapt to new social perceptions, preferences, and norms. In all cases, however, current techniques do not yet tell landscape managers enough about ordinary people's understanding of the landscape, about their own understanding of people's landscape values, and about the educability of either of these expectations if more information and interpretation were integrated

into management activities.

General Principles and Particular Places

A characteristic shared by many present techniques is a reductionist approach to the study of landscape values. That is, many techniques seek to break up the landscape into separable characteristics that can be identified individually and then recombined - for instance, by weighting - so that in principle the techniques could produce a consistent set of general rules for assigning values applicable to large numbers of landscapes (cf. U.S. Forest Service 1973). If they are successful, the benefits for managers are obvious. But should all landscapes - or even all landscapes of a particular type - be managed by the same set of principles?

Charles Little (1979) suggests that there is a growing divergence between the landscape values capable of being easily rationalized as public policy, and those associated with actual personal perception. To the extent that our purpose is to protect the sense of value which people experience in the landscape, is that purpose best served by the present emphasis on reducing it to characteristics that can be inventoried, and applied uniformly to different regions and places; or should additional effort be devoted, for instance, to more holistic concepts of landscapes; perhaps to more idiosyncratic composite images that comprise particular places, rather than to general principles that can be transferred as regulations to all places?

Fred Bosselman (1979), too, has recently argued that what is most important about landscapes is their "specialness" rather than their generalizable qualities, the sense of special place that people can experience while in one that they cannot experience in other places. Each national park, for instance, is established and managed under its own unique statute, not under a homogeneous set of system-wide rules - because each was set aside for its own particular qualities, not for common ones. The same sense of place is found in other places that people prefer - it is their specialness as whole places, not their generalizable characteristics, that make them preferred (cf. also Leopold 1966). Bosselman argues therefore that the goal of management should be to enhance the special qualities of each landscape as an individual place, rather than to develop uniform rules for all places.

Kevin Lynch (1976), similarly, in a recent and stimulating essay, argues for managing the "sense of a region," by which he means the quality of particular places as people experience them. People sense places on a very local scale, Lynch

argues, and experience them in regional patterns or images. They experience them, moreover, not only with sight but with all their senses - hearing, taste, smell, touch as well. The quality of a place is made up of patterns of these sensations embedded in their experience and expectations. Landscape management, therefore, should include far more attention to the sensory qualities of individual places and regions, and to the effects of those qualities on people's experience and well-being.

If these three views are correct, more effort is needed to discover and characterize the holistic qualities of individual places and guide the management of them. It is quite likely that some of today's techniques for preference analysis could be extended to serve this purpose: in a sense this task is far simpler than attempting to define general principles for large numbers of landscapes. Others might fruitfully arise out of greater cross-fertilization between public lands-oriented landscape research and the even larger parallel tradition of work on urban landscapes (Lynch 1976). Still others might require new and different approaches. All would require greater emphasis on understanding the meaning of particular places to people who experience them, rather than on abstract or generalized methodologies for making landscape design decisions.

It is important to emphasize that this is not an argument for singling out "unique" places for special attention. The national landscape does have many unique places, some unique in their beauty and others in their ugliness. So do cities. The need is to recognize and respect the special sensory qualities, the particular aesthetic potentials, of every place - the public lands and forests as well as the national parks and monuments, the daily places of people's lives and work as well as the national lands where they recreate.

Comparative Analysis

A final comment on the current state of the art is that there has so far been little comparative analysis of the different techniques that are available (Andrews and Waits 1978). This problem has been noted by others as well: Cerny (1974:244), for instance, comments that most techniques have been applied only by their originators. Even vocabulary may vary considerably from one technique to another, without consensual definitions of many evocative terms and metaphors used to characterize people's perceptions. It is extremely difficult, therefore, to evaluate the usefulness of alternative techniques to landscape managers, or even to know whether different techniques are likely to yield consistent results - and if they do not, which (if

either) is "correct." This subject clearly needs more attention from the research community, perhaps by applying several techniques to common case studies and comparing the results.

ANSWERS AND QUESTIONS

What improvements in technique, therefore, do landscape managers need to insure "appropriate consideration" of landscape amenities and values, that the state of the art may not now provide? Some answers to this question have already been suggested above. One is additional attention to the relationships between people's preferences and cultural norms, and between both of these and the landscape's ecological functions. A second is more attention to the relationships between people's preferences and their knowledge and expectations of the landscape - including those of landscape managers - and to their responsiveness to additional information. A third is the development of holistic approaches to the values people experience in particular landscapes, and comparison of these approaches with existing techniques - as well as comparative analysis among existing techniques themselves, and especially, better fusing of experience between research on wildlands and on urban landscapes.

To these I would add three more. First, in developing and improving its techniques, the research community needs better information about how landscape managers actually perceive and use their results. What kinds of information are actually used in decisions, and what serves mainly just to rationalize decisions already made? What do managers not now know that they wish they did, that new techniques could provide? Which techniques actually worked in practice, which did not, and why? The answers to such questions are sometimes disappointing, but they are indispensable to further progress.

Second, landscape managers could be acting much more vigorously to incorporate landscape values, and aesthetic considerations generally, under existing laws. NEPA contains three clauses that require this, and the new regulations of the Council on Environmental Quality explicitly require discussion of unquantified or qualitative impacts on environmental amenities and values.^{4/} Numerous statutes contain more specific requirements for the consideration of particular aesthetic concerns. These issues are frequently ignored or discounted, however - perhaps out of an unfortunate assumption that aesthetic concerns

^{4/} 43 Federal Register 55997 (November 29, 1978), § 1502.23,

are luxuries rather than essentials or that they are purely subjective matters of taste that cannot be objectively justified (Bufford 1973). Many agencies also fail even to make use of existing methods for consideration of landscape values, let alone to reach beyond them; many planners so far lack informed awareness of the tools and methods that are available to them (USEPA 1973). Wider dissemination and testing of existing methods is clearly in order.

Finally, increased attention is needed to aesthetics in people's everyday environments, rather than merely in highway design and public lands management. Far more Americans' experience is of necessity in urban and suburban places than in the public lands and highways where they recreate; it would be unfortunate if our primary emphasis in research were heavily concentrated only on the latter.

Existing laws already permit far more vigorous protection of the landscape's visual resources than is generally practiced by most government agencies. What is too often lacking is simply a real understanding and concern for the visual landscape, an imaginative approach to the identification of alternatives for it, and the effective political leadership and will on the part of landscape managers to protect it. The most fundamental issue, therefore, is not the particular methods and techniques by which landscape values are characterized - though these methods can and must continue to improve - but getting those values more fully represented and more seriously considered, by whatever legitimate means, in the public and corporate decisions that affect them. If their significance is recognized, improvements in analysis can easily continue. If their significance continues to be discounted in decisions, however, improvements in analysis alone may be of little help.

LITERATURE CITED

- Anderson, Eddie
1978. Visual Resource Assessment: Local Perceptions of Familiar Natural Environments The University of Michigan, Ann Arbor (Ph.D dissertation).
- Andrews, Richard N.L. and Mary Jo Waits
1978. Environmental Values in Public Decisions. 90 pp. School of Natural Resources, The University of Michigan, Ann Arbor.
- Bosselman, Fred P.
1979. The World as a Park. *In* Land in America: Commodity or Natural Resource? R.N.L. Andrews, ed. p. 71-81. Lexington Books, Lexington, Mass.
- Bufford, Samuel
1973. Beyond the Eye of the Beholder: Aesthetics and Objectivity. Mich. Law Rev. 71:1438-1463.
- Cerny, James W.
1974. Scenic Analysis and Assessment. Chemical Rubber Company Critical Reviews in Environmental Control 4(2):221-250.
- Clay, Grady
1958. Remembered Landscapes. Landscape 7(2):7-10.
- Craik, Kenneth H.
1969. Forest Landscape Perception: Final Report. 23 pp. Institute of Personality Assessment and Research, University of California, Berkeley.
- Daniel, Terry C. and Ron S. Boster
1976. The Scenic Beauty Estimation Method. USDA Forest Service Research Paper RM-167, 66 p. Rocky Mountain Forest and Range Exp. Stn. Fort Collins, Colo.
- Fabos, Julius C.
1974. Putting Numbers on Qualities -- The Rising Landscape Assessor. Land. Arch. Q., April:164-165.
- Kaplan, Stephen
1978. Perception of an Uncertain Environment. *In* Humanscape: Environments for People. Stephen and Rachel Kaplan, eds. p. 30-35. Duxbury Press, N. Scituate, Mass.
- Lee, Robert C.
1978. Assessing Visitor Concern for Landscape Quality: A Management Report. 7 p. Department of Forestry and Conservation, University of California, Berkeley.
- Leopold, Aldo
1966. A Sand County Almanac. Ballantine Books, New York. (orig. 1949)
- Little, Charles E.
1979. Preservation Policy and Personal Perception: A 200-Million-Acre Misunderstanding. *In* Land in America: Commodity or Natural Resource? R.N.L. Andrews, ed., Lexington Books, Lexington, Mass., p. 83-98.
- Litton, R. Burton, Jr.
1968. Forest Landscape Description and Inventories. USDA Forest Service Research Paper PSW-49, 64 p. Pacific Southwest Forest and Range Exp. Stn., Berkeley, Calif.
- Lynch, Kevin
1976. Managing the Sense of a Region. MIT Press, Cambridge, Mass.

- McKechnie, George E.
1974. Environmental Response Inventory Manual. Consulting Psychologists Press, Palo Alto, Calif.
- O'Riordan, Timothy
1971. Perspectives on Resource Management, 183p. Pion, London.
- Radar, T.D.
1971. A Study of Suburban Forests, Suburban Forest Owners, and Aesthetic Values. Cornell University, Ithaca, N.Y. (Ph.D dissertation).
- Schweitzer, D.L., J.R. Ullrich, and R.E. Berman
1976. Esthetic Evaluation of Timber Harvesting in the Northern Rockies - A Progress Report. USDA Forest Science Research Note IMT-203, 11 pp. Intermountain Forest and Range Exp. Stn., Ogden, Utah.
- Smardon, Richard C.
1978. Law and Aesthetics or When is the Pig in the Parlor? Unpublished paper, University of California, Berkeley.
- Yuan, Yi Fu
1974. Topophilia: A Study of Environmental Perception, Attitudes, and Values. Prentice-Hall, Englewood Cliffs, N.J. 260 p.
- U.S. Environmental Protection Agency
1973a. Aesthetics in Environmental Planning. Report No. EPA-600/5-73-009, November, 187 p.
- U.S. Environmental Protection Agency
1973b. Toward A Philosophy of Planning: Attitudes of Federal Water Planners. Report No. EPA-R5-73-015, March. 224 p.
- U.S. Forest Service
1973. National Forest Landscape Management, Volume 1. 77 p.
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