IS NATURE GOOD?

The great majority of land use changes evoke no controversy. Of course, there is general and subdued grousing on the op-ed pages: "Where have all the flowers gone?" and "Gonna get gridlock," and so on. And environmental advocacy groups and local neighborhood associations should be credited for doing excellent work in exercising various conservation agendas.

But conservation as a social force is still effective only on the margins, only on behalf of the endangered attractive mammal, a spectacular view, or any natural resource that can match up well in a cost-benefit analysis. Regardless of local and specific successes, the world and the country continue to lose habitats and species daily.

The real problem is simple: A democratic majority cannot agree that a problem exists, that the collective human self-interest is threatened when native plants and animals are displaced by people in the course of making places for themselves.

The question really is: Is nature *intrinsically* good rather than *instrumentally* good? If portions of the ecosystem (rain forests, for example) must be left undisturbed to ensure survival of the whole ecosystem, then making a balance between the portions that are needed by nature and the portions that are needed by humans is a crucial design problem.

As yet, no value system or general theory allows discussions that satisfactorily balance the land requirements of humans and of wild nature. What I want to do is interject an argument based on floral and faunal rights into the discussion of place quality, and to discuss who should be responsible for assuring those rights.

Capitalist and Utilitarian Approaches to Environmental Management

Each of us has a particular set of attitudes toward and expectations from our environment. At one extreme, we may take a position that leaving the smallest possible human footprint is the appropriate way to regard wild nature; that a single high rise with parking beneath, located on the northernmost point of a particular site, is the correct way to house people and preserve nature. Even so, most of us take it as a given that we will house and feed people. Even the most parsimonious environmental plan does not deny that.

Most everyone prefers to do the right thing. Few Americans will argue that deriving income from the real estate market is morally wrong. John Livingston, in an excellent book with the off-putting title *The Fallacy of Wildlife Conservation*, suggests wildlife management must follow a utilitarian path and generate income in order to persevere.[1] Such strategies therefore protect products of ecosystems for which people will pay to hunt or observe, but not ecosystem *processes* that, if healthy, would continue to generate products that would not necessarily be economically or aesthetically satisfying. It is like building an ark and inviting only friends: The uninvited cannot vote themselves a place on board.

Such utilitarian ethical positions often are called upon to support the capitalist philosophy, "if I am better off, then society is better off." But this ethical egoism fails to satisfy a second requirement that no one be worse off. In those now frequent cases in which people have been enjoying land either directly—visually or recreationally—or vicariously on behalf of wildlife, and that land is legally bulldozed and built upon, real disbenefits may be alleged.

Complaints about such changes focus on the legal and political rules that convey property rights to the owner and the susceptibility of such rules to creative and, hence profitable, manipulation. The deep roots of property law hold the intended invasion and colonization of nature's territory as lawful. The contents of the place (excepting valuable minerals) are also property and may be appropriated at will. Nowhere in law are rocks, soil and water legally described as a place named "Nature"; nor is there a constitution that declares the purpose of nature.

Developers make the further rationalization that they provide a needed good, such as housing; the savvy developer will insist that human demand drives the bulldozer, not greed or avarice. Consequently, as long as the human population grows, plants and animals will be exterminated so that rights and privileges customarily enjoyed by people will continue.

I myself make an interesting rationalization. The nearly one acre on which I live was forest until 1952. I was not party to the economic decision to convert the land to house and garden. Therefore, I take comfort in not personally having invaded and subjugated the previous floral and faunal community. Fortunately, perhaps, for our collective conscience, most residential location decisions are being made by professional planners and corporations. The individual goes blameless.

The problem for developers of housing in particular is correctly to anticipate the expectations of new owners and renters regarding the floral and faunal components of the grounds of new developments. To obtain some notions of what attitudes might prevail in a typical new subdivision, we may look to the attitudinal research of Stephen Kellart.[2] Despite what might seem to be expected findings that higher education and income levels correlate with high levels of knowledge about animals, two of his conclusions interest me. First, in any population of potential homeowners, only about one-third may be expected to know anything about endangered species (the animals, not the law). Second, whatever concern may exist for animals is reserved for those phylogenetically "higher" animals that are aesthetically attractive. An endangered mammal will generate high levels of public support. An endangered snake will not.

Consequently, even though we all want to do the right thing, future owners cannot be relied upon to provide answers to the questions: Should I put houses on this site? If so, where should I put them?

The Failures of Ecological Planning

Many of us are conditioned by the environmental rhetoric of the 1970s to believe that nature is good when it is diverse, stable and productive.[3] We exalt in its climax. But it is fair to assert that borrowings from ecology have yet to produce a normative theory that serves not only as a basis for action but also permits unequivocal rejection of bad environmental design proposals.

McHarg's *Design with Nature* appears on most lists of basic landscape architecture writings and established the ecological inventory as the initial phase of site development.[4] The eco-

logical inventory serves as the basis of a vegetation plan, which is a normative geographic articulation of a site planner's prescription for the future of a project's natural environment. The vegetation plan is the hoped-for "best fit" between nature and humans; comfort is taken when the species lists that dominate the legends of such plans are long and include rarities.

The goal is to express "objective" criteria for leaving portions of a site "natural." Displayed on countless such documentsare plans about what to leave "natural" and what plants to install. Sometimes plans are concerned with more than aesthetics; they express the designer's concern for nature, which could be regarded as a form of atonement or reduction of cognitive dissonance in the sprawl of urbanization.[5]

Having learned that insulating nature causes species losses, a question arises: what should the minimum size of natural areas be? Several studies propose nature reservations in the five- to ten-acre range, which are a hard sell in today's real estate development market.[6]

Even though nature might be "best" when large and intact, incursions of development are rationalized under the broad stewardship ethic.[7] The difficulty of evaluating environmental impact has compelled even prominent ecologists to take the side of the developer in cases in which impact is conceded but a "scientific" judgment is made that the impact is not adverse; that is, the proposed development does not impair the "goodness" of the place.

Lynch's Tests for Goodness

In *A Theory of Good City Form*, Kevin Lynch dismisses several categories of form-generation growing out of planning theory and suggests that form may not be critical at any development scale. What is critical is whether the human inhabitants enjoy continuous growth and development.[8]

Lynch lists five criteria (vitality, sense, fit, access and control) and two meta-criteria (efficiency and justice) as performance dimensions of human settlement quality. The five criteria map neatly onto ecological parameters for niche and community survival; that is, they may be employed in the design of a subdivision, an arboretum, or even an aquarium. And as Lynch points out, the two meta-criteria are themselves aspects of each criterion. In each case one asks, "What is the cost (in terms of anything else we choose to value) of achieving this degree of vitality, sense, fit, access, or control?" and "Who is getting how much of it?"[9]

It is ecologically reasonable to assert that to destroy the plant or animal's "performance dimensions" is to destroy the organism. If plants and animals have value only in their use to people (instrumentally), then any conversion of land will consider these values lost as "opportunity costs." That is, the value of the new houses or shopping centers is greater than the opportunities forgone. On the other hand, if plants and animals have an *instrinsic* value, then some extra-market system must arise to embrace values which money does not measure. It is in the principle of justice where I believe the opportunity to lie.

Nature and Justice: How Much Nature is Enough?

Many of us have embraced the "spaceship earth" notion, which emphasizes the relatedness of air, rocks, soil, water, plants, animals and people. It seems evident that humans are a population of biological organisms that are successfully extending their range; nevertheless, the special case of our humanity imposes the special condition of duty toward other creatures (as individuals, not as abstract populations). The question then becomes, "How much land should be left for the present occupants?" Or, "What are the rights of animals and plants?"

Taylor's principle of *distributive justice* proposes: Half is fair.[10] Perhaps we would ask the lion's share, but the metaphor points in the right direction. Interestingly, Howard Odum [11] has used the same figure as a rule-of-thumb answer to a similar question: How much of an ecosystem should be preserved to effect its persistence?

A complication in this simple logic occurs when we consider the intended use of the land. Whether the need is basic is a critical point. As a biological organism, we may include housing among our basic needs. Would be feel the same about converting a natural area to a hamburger stand or a water slide as we might about houses?

Taylor's principle of mimimum wrong would require that we both minimize the triviality of the non-basic need and minimize the area taken for it. This principle further recognizes that the human species has developed an extensive culture: Land uses such as art museums do not insure survival,

but are nonetheless basic to our fulfillment as a species; that is, they could be considered "good" in terms of Lynch's performance dimensions.

Taylor's principle of *redistributive justice* suggests that providing compensation is an ethical response to non-basic land uses. For example, four vacation dwelling units per acre cover about 50 percent of the ground. Requiring that the remaining soil grow plants that function as habitat or nourishment for animals seems reasonable. Requiring higher density (and more profitable) developments to reserve equivalent quantities of land (perhaps elsewhere) also seems reasonable. Excesses of non-basic vegetation (that is, vegetation that does not serve the endemic fauna) such as grand sweeps of lawn, allees and sparkling fountains might require compensation as well.

A legal mechanism commonly used to protect urban open space or landmarks is intriguingly applicable in this situation as well: Transfer of Development Rights. Successful TDR systems depend on a method of recording development transfers, such as a land banking account. A simliar legal rationale could be used to establish environmental justice transfers, and a similar accounting mechanism could keep track of them.

The Shape of Nature's Half

During the last 15 or so years landscape architecture has looked to ecology to provide the land development value system that economics, law and political science could not. Employing a vocabulary that includes terms such as "diversity," "stability" and "productivity," landscape architects attempt to identify the most "valuable" land for special attention, such as preservation, and undertake the necessary development on the rest. Believing those areas "less valuable" provided all the rationalization needed to send bulldozers to the site.

Non-specific vegetation plans, that is, the map outlines of Nature's half, recognize that the plants that were on the site prior to development might resume if given the opportunity. The design challenge then becomes creation of the physical form of the container in which we wish nature to go about its business while we go about ours. (This is somehow more comforting to us than the equally reasonable notion of designing containers for ourselves in a "natural" setting.) The physical linkages between the containers and human development then yield to the principles of landscape ecology.

I do not suggest that ecologically significant sites be left to these principles, nor sites significant from other perspectives (botanical, zoological, anthropological, etc.). In these cases, there are organized interest groups with their own scientists, lawyers and foundations, all of whom would welcome a chance to negotiate with the developer.

I can think of three possibilities for applying the science of landscape ecology to the design of an ethical vegetation plan. Assume first that a reserve has been created under the criterion of distributive justice. Then, under the criterion of redistributive justice, there are several types of restitutions that could be considered:

Functional shakkei. This means applying the Japanese concept of "borrowed scenery" in a functional context. Where vegetation on an adjacent property can be seen by humans, it probably can be seen by animals (many of which use vision as the primary source of environmental information) as well. This places a new level of significance on that most-often-heard design studio criticism: "You failed to consider the regional context."

The technique for applying this concept this seems too simple to mention, but this is it: Push the green blotches that are part of newly developed areas into the site lines of existing green blotches.

Invisible reweaving. This is a phrase tailors use to describe a process by which they repair holes in fabrics. The tailor selects matching colors of thread and weaves a patch into the fabric by imitating the original pattern.

Landscape ecology gives us the tools for recognizing the particular plaids of a landscape. Ecologists can similarly analyze the patches and corridors of the landscape for size, distance apart and width and orientation of connections. A ruling mosaic for the particular landscapes in which we live and work may be recognized and committed to memory much like a tailor in Scotland would know his plaids.

Fractals. The word, coined by Benoit Mandlebrodt,[12] caused quite a stir in many disciplines. Short for fractional dimension, the concept is most easily understood in the following examples: A line has one dimension. A plane has two. For a serpentine line, Mandlebrodt would assign a dimension of between one and two. A sheet of paper has two dimensions. A box has three. Crumple the paper and the resultant form is assigned a dimension of between two and three.

Thomas Jefferson made an early fractal translation of the British garden style in his Virginia landscape. Complaining that Virginia was too sunny and hot to open great lawns on which to arrange islands of trees, he instead arranged islands of shrubs under the pines.[13]

What I am suggesting is that most of the green blotches on vegetation plans are only two dimensional. Yet, we know that plants and animals have adoped elegant strategies for arranging themselves in three dimensions. A beginning cure for this nearsightedness would be the introduction of a vegetation analysis and plan that stratifies the vegetation into at least the well-known herb, shrub and canopy layers. Studied as abstractions, these patch-and-corridor diagrams may suggest linkages of facilities designed for humans that complement the endemic biogeographic patterns.

But, Is a Zoo a Good Place?

Invoking the concept of the world as a "megazoo" concedes that the planet will become fully domesticated (in the normal sense of this word). Indeed, it is frequently argued that this has happened already. We are heartened by the accommodations of people to nature in some places, but lament the loss of species requiring large areas of habitat or those susceptible to even small human incursions.

In places where development is occurring, on a site by site basis, application of the "Half is Fair" principle can retain a significant functional natural environment and can accommodate future conversions to cities and farms. It is very likely that we will grow to like a landscape shaped by "Half is Fair" as long as the performance dimensions of vitality, sense, fit, access and control are well met, and as long as it is just.

Notes

1. John Livingston, *The Fallacy of Wildlife Conservation*, and Peter Jacobs, "Environmental Strategy and Action," *Human Settlement Issues* 6 (Vancouver, B.C.: University of British Columbia, 1981).

2. Stephen R. Kellart, *Public Attitudes toward Critical Wildlife and Natural Habitat Issues* (Washington, D.C.: United States Department of the Interior, Fish and Wildlife Service, 1979).

3. E. P. Odum, "The Strategy of Ecosystem Development," *Science* 164 (1969). This was an influential document in the development of an ecological determinism that described nature as a purposive system.

4. Ian McHarg, *Design with Nature* (New York: Natural History Press, 1969).

5. The leapfrogging of development and attitudes about development ensures that a segment of the populace is always dissatisfied. Also, as Percival and Paul Goodman point out in *Communitas: Means of Livelihood and Ways of Life* (New York: Vintage, 1960), alienation frequently accompanies growing up. Landscape architects likely exhibit a similar set of attitudes; the common denominator of the craft is the aesthetic traditional. Even if a development violates ecological determinants, it can be well received if it is "stylish."

6. See A. L. Sullivan and M. L. Shaffer, "Biogeography of the Megazoo," *Science* 189 (1975); and E. L. Goldstein, M. Gross and A. L. Marston, "Biogeographic Approach to Greenspace" *Landscape Research* 10:1 (1985).

7. Bob Scarfo reminds us that we are quick to forgive a developer who employs a landscape architect. This is a win/win situation in which, if the development is successful, the influence of the landscape architect is credited. If it is unsuccessful, the developer is blamed. See Bob Scarfo, "Stewardship," *Landscape Architecture* 77:3 (Washington, D.C.: American Society of Landscape Architects, 1987).

8. Kevin Lynch, *A Theory of Good City Form* (Cambridge, MA: MIT Press, 1981).

9. Lynch, p. 119.

10. Paul W. Taylor, *Respect for Nature* (Princeton, NJ: Princeton University Press, 1986). Note, however, that Japan remains 80 percent forested at a population density 20 times that of the United States. The Japanese seem comfortable trading density against open space.

11. Estimates in the 30 to 50 percent range are common, but exact definition of "persistence" precludes application. This particular estimate came from my notes on a lecture by Howard Odum at the University of Pennsylvania in 1974. An early version of this material was presented at CELA 86.

12. Benoit Mandlebrot, *Fractals* (San Francisco: W. H. Freeman, 1977).

13. Peter Hatch, "Thomas Jefferson: Gardener and President," *Progressive Farmer*, July 1985.