

The Limits to Caring: Sustainable Living and the Loss of Biodiversity

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Abstract: Caring for the Earth represents current, middle-of-the-road thinking on the relationship between conservation and development. This IUCN/UNEP/WWF document has embraced a purely utilitarian perspective: it considers the conservation and development of natural resources to be the same process. In this analysis, I argue that the goal of creating the sustainable society, as defined in Caring for the Earth, is an unattainable utopia, and that the mechanisms proposed to attain this goal will lead irrevocably to the loss of biological diversity. I consider the history of the concept of sustainable development, and then document the constraints on sustainable use of natural resources. Sustainable use only occurs when both human needs are met and the losses of biodiversity and environmental degradation are acceptable. These conditions are not always met when natural resources are used, and I consider the fundamental contradictions between resource potential and human needs. I conclude by emphasizing that while sustainable use is a powerful approach to conservation, it is not the only one, and the conservation of many species and biological communities also requires a preservationist approach.

Los límites de cuidar: vida sostenible y la pérdida de biodiversidad

Resumen: Cuidar la Tierra representa una forma moderada de pensar en relación a los conceptos de conservación y desarrollo. Este documento de la IUCN/UNEP/WWF abarca una perspectiva totalmente utilitarista. En éste se considera que la conservación es lo mismo que el desarrollo de los recursos naturales. En este análisis, yo argumento que la meta de crear una sociedad sostenible como está definida en Cuidar la Tierra, es una utopía que no se puede alcanzar, y que los mecanismos que se proponen para obtener esta meta llevarán a la irrevocable pérdida de la diversidad biológica. Se examina la historia del concepto de desarrollo sostenible, y después se documentan las limitaciones del uso sostenible de los recursos naturales. El uso sostenible solamente ocurre cuando las necesidades humanas están satisfechas y cuando las pérdidas de la biodiversidad y la degradación del ambiente son aceptables. Estas condiciones no siempre son satisfechas cuando los recursos naturales son utilizados, y examino las contradicciones fundamentales entre el potencial de los recursos y las necesidades humanas. Concluyo enfatizando que mientras el uso sostenible es un enfoque eficaz para la conservación, no es el único, y que la conservación de muchas de las especies y comunidades biológicas también requiere de un enfoque preservacionista.

Introduction

Caring for the Earth: A Strategy for Sustainable Living, was launched in October 1991. It is an important manifesto for two reasons. First, it is the explicit successor to the *World Conservation Strategy*, the original global conservation blueprint published in 1980. Second, like the *World Conservation Strategy*, *Caring for the Earth*

is authored by and bears the imprimatur of some of the world's most respected conservation organizations: the World Conservation Union (IUCN), the United Nations Environmental Programme (UNEP), and the World Wide Fund for Nature (WWF). The *World Conservation Strategy* was the first influential conservation document aimed at government officials and development practitioners, as well as at conservationists. It legitimized the involvement of government and development agencies in conservation. In the world envisioned by the *World Conservation Strategy*, parks and reserves were seen

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not only as bastions for wildlife but also as integral components in national strategies of development. National Conservation Strategies, following the format developed in the *World Conservation Strategy*, were prepared in over 50 countries. The World Bank, the U.S. Agency for International Development, and the European Community poured millions of dollars and ecus into conservation projects. *Caring for the Earth* seeks to assume the mantle of this tradition. This document will be perceived as the middle-of-the-road, pragmatic, responsible thinking on conservation issues by those deciding governmental and developmental policy throughout the world. This explicit objective is stated in the introduction; "*Caring for the Earth* is intended to be used by those who shape policy and make decisions that affect the course of development and the condition of our environment" (p. 3). And it will be.

Yet *Caring for the Earth* represents a significant departure from previous thinking on the conservation of natural resources and of biodiversity. (1) The sustainable society as defined in *Caring for the Earth* is an unattainable utopia because it states goals and principles incompatible with one another. By not acknowledging the conflicts and contradictions inherent in conservation and development, the analysis is simplistically optimistic. (2) The goals of sustainable use and sustainable development, as defined in *Caring for the Earth*, will lead irrevocably to the loss of biological diversity. This biological diversity is not simply numbers of species, many of which are supported in human-managed ecosystems (Pimentel et al. 1992), but it concludes "the variety and variability among living organisms and the ecological complexes in which they occur" (OTA 1987), a definition that encompasses ecosystem, species, and genetic diversity.

Caring for the Earth can best be understood by first examining how the emphasis on development and conservation has changed when compared with the earlier document. In 1980, the *World Conservation Strategy* stated that "the object of development is to provide for social and economic welfare, [and] the object of conservation is to ensure Earth's capacity to sustain development and to support all life." The significant concept popularized in the *World Conservation Strategy* was that conservation and development were not necessarily mutually exclusive. By incorporating the conservation approach into global policy, development can be made sustainable and natural systems, together with their biological diversity, can be conserved. The *World Conservation Strategy* popularized the term "sustainable development" as a process in which conservation and development were mutually dependent. The specific objectives of the *World Conservation Strategy* were to maintain ecological processes and life-support systems, to preserve biological diversity, and to ensure

that use of natural resources was sustainable. The focus therefore is on the natural world and human dependence on our environment. The *World Conservation Strategy* promulgated the concept of *conservation through sustainable development*.

The goals of *Caring for the Earth* are superficially similar, but there is a different emphasis. The goal is "to help improve the condition of the world's people" through two actions: development of a sustainable society and integration of conservation and development. *Caring for the Earth* argues that in a sustainable society, conservation and development are totally compatible with one another (not, as envisioned in the *World Conservation Strategy*, as two separate but mutually dependent activities). *Caring for the Earth* states that "conservation and development . . . are essential parts of *one* indispensable process" (p. 8, my italics). In a sustainable society (by definition), people will improve the quality of their lives, while conserving the Earth's vitality and diversity and keeping within the Earth's carrying capacity. In other words, *Caring for the Earth* promulgates the concept of *sustainable development*: conservation will be an inevitable consequence of such development.

Caring for the Earth includes a long list of general principles that define the sustainable society. This list includes the specific objectives of the *World Conservation Strategy*: maintaining ecological processes and life support systems, preserving genetic diversity, and ensuring the sustainable utilization of species and ecosystems. Additional principles include respecting and caring for the community of life, improving the quality of human life, minimizing the depletion of nonrenewable resources, keeping human numbers and life-styles within the earth's carrying capacity, changing personal attitudes and practices, enabling human communities to care for their own environments, providing a national framework for integrating development and conservation, and creating a global alliance for sustainability. These principles are emotionally appealing, and the recognition that humans need to redefine their relationship with the natural world is a necessary one.

Caring for the Earth within its specified limits of interest and within its own definitions is an admirable document and sets out basic tenets of living that we all must follow if we are to survive on this planet. Its failure is that it does not acknowledge that the goals of development are different from the goals of conservation, and it offers no general principles by which we might resolve conflicts and balance contradictory demands. *Caring for the Earth* does not recognize that while improving the quality of human life, we will inevitably decrease the diversity of life. If we do not acknowledge the contradictions, we will smugly preside over the demise of biological diversity while waving the banner of conservation.

Sustainable Development

The goal of national development in the 1950s and 1960s was to increase the Gross National Product (GNP) of countries, especially in the South. The mechanism was technological progress. The result was supposed to be an increase in the consumption of natural resources and their use by people, an increase in national export and import of goods, and an increase in the human standard of living. The problem was that by the 1970s it was clear that the process was not working in much of the world (Redclift 1987; Sachs 1991). Consumption of natural resources was up, but the disparity between and the economic dependence of the South on the North had increased. In many countries, per capita incomes were down, deforestation, overgrazing, and overcultivation were up. Environmental degradation in the countries of the South was becoming increasingly evident, and the economic costs of this were becoming appreciated. The loss of wildlands and the disappearance of species were provoking alarm (Ehrlich & Ehrlich 1981).

Popular concerns with the consequences of national development crystalized in the publication *The Limits to Growth* (The Club of Rome 1972), which examined the long-term trends in world population, resource use, food production, and industrialization. In the same year, the United National Conference on the Human Environment was held in Stockholm, and led to the establishment of the U.N. Environmental Program (UNEP). These initiatives were followed by the *World Conservation Strategy* in 1980.

The *World Conservation Strategy* retained the traditional concept of development, which it defined as activities that "satisfy human needs and improve the quality of human life." Its innovation was that it acknowledged that alone this approach was not sufficient. The *World Conservation Strategy* advocated the approach of *sustainable* development, which incorporated social and ecological considerations for *long-term* as well as short-term advantages. Conservation was then linked to development, by defining it as activities that "yield the greatest sustainable development to present generations while maintaining its potential to meet the needs and aspirations of future generations." This concept goes back, at least, to the utilitarian philosophy of Gifford Pinchot, the father of North American forestry and the person who defined conservation in this 1947 autobiography as "the greatest good for the greatest number for the longest time."

The *World Conservation Strategy* vision of conservation was not purely utilitarian, embracing as it does "preservation, maintenance, sustainable utilization, restoration, and enhancement of the natural environment." Sustainable development requires conservation, but it is

not the same process as conservation. The *World Conservation Strategy* recognized that conservation action can limit development (e.g., "Protected areas and other conservation measures, however, may restrict access to fuel, food, forage, and other products"), and that development can decrease biodiversity (e.g., "Most changes of use, other than protection, involve a loss of equilibrium in the ecosystem concerned, sometimes a radical loss"), and it devoted an entire section to the methods of balancing competing land uses.

In the 1987 report of the World Commission on Environment and Development (otherwise known as the Brundtland Commission), there was a significant redefinition of sustainable development, which was defined as development that "seeks to meet the needs and aspirations of the present without compromising the ability to meet those of the future." This definition is virtually identical to the *World Conservation Strategy*'s definition of "conservation." This definitional shift followed from the Commission's focus on the failure of development and from the environmental consequences of that failure. The Brundtland Commission focused on the environmental problems associated with development—not on the conservation of the natural environment. The concern is with "the impact of ecological stress—degradation of soils, water regimes, atmosphere, and forests—upon our economic prospects" (my italics). The Commission was able to appropriate the language of conservation in its definition of sustainable development because it adopted an exclusively utilitarian approach—not considering the need to conserve any life that was not explicitly useful to human beings.

In *Caring for the Earth*, the goal is to build a sustainable society. This requires sustainable development, which is defined as "improving the quality of human life while living within the carrying capacity of supporting ecosystems" (p. 10). Whatever its intent, this definition emphasizes traditional development at the expense of the conservation of natural resources and biodiversity.

This definition, while differing from that of the Brundtland Commission, follows its lead by ignoring the dichotomy between conservation and development. However, unless one adopts a purely utilitarian approach, conservation and development are *not* the same process. Frequently the two processes are compatible (a realization that was at the heart of the *World Conservation Strategy*), but when they are not, human development can lead to species extinction, and conservation can limit development. *Caring for the Earth* does not recognize this incompatibility.

This definition of "sustainable development" reverts to a definition that approximates the *World Conservation Strategy*'s definition of "development." The goal is to improve the quality of human life (defined broadly in terms of social, cultural, and economic welfare). *Caring*

for the Earth states that "it is important to remember that we are seeking not just survival but a sustainable improvement in the quality of life of several billion people" (p. 43). Unfortunately, stating that development should be sustainable does not make it so. Sustainable development ultimately requires that renewable resource consumption be stationary, that the product of number of people and the resource amount which each consumes not increase (Daly 1980). This requires: (a) technological advances that would allow our planet to support more people at a higher quality of life (Simon 1980, but see Redclift 1987); (b) a dramatic reduction in the world's human population; and/or (c) a dramatic reduction in the level of consumption in affluent countries to allow an improvement in the quality of life in poorer countries. None of these possibilities seems likely unless there are significant changes in the process of development. Yet *Caring for the Earth* provides no analysis of how to achieve these goals. Indeed, *Caring for the Earth* does not appear to deviate from the traditional development formulae of the 1950s and 1960s, and a continuation of such policies will surely decrease biological diversity.

This definition of sustainable development requires that it take place "within the carrying capacity of supporting ecosystems" (p. 10). However, carrying capacity is not an ecosystem characteristic, but is defined for the population of a given species (Begon et al. 1986). In the case of *Caring for the Earth*, the species of interest is the human being. The carrying capacity of earth for humans depends on a complex interaction of environmental potential, lifestyle aspirations, technologies, and sociopolitical and economic organization (see Daily & Ehrlich 1992). Yet as a general rule, human beings are more able to use ecosystems at young successional stages, which tend to be more productive. Accordingly, a general characteristic of human development is that we tend to maximize productivity by creating and maintaining ecosystems at such stages. This requires energy input, in forms such as irrigation, insecticides, fertilizers, mechanical alterations of the environment, etc. In contrast, undisturbed ecosystems, not subject to such inputs, become mature, and tend to be less productive, but more biologically diverse. In other words, the goal of maximizing the carrying capacity of human beings will encourage intensive agriculture at the expense of natural systems, pine plantations in place of hickory-oak forests, and maize fields instead of tropical savannas.

This definition of sustainable development reverts to a popular misunderstanding of natural systems—that they exist at equilibrium, and that there is a "balance of nature" (see Brussard 1991; Pimm 1991). While some natural systems are relatively stable and maintaining them at stasis will tend to preserve species biodiversity, other systems require disturbance. Many biological

communities are not structured by intraspecific competition alone (Andrewartha & Birch 1954) and require nonequilibrium conditions to maintain biological diversity (e.g., Connell 1978; Hubbell 1979).

Sustainable Use

Caring for the Earth formally links sustainable use to sustainable development. To keep within the carrying capacity of an ecosystem requires that resources be used sustainably. Sustainable use requires that resources are used "at rates within their capacity for renewal" (p. 10). Defined in these very general terms, sustainable use is noncontroversial and generally supportable by all thoughtful people.

Two ideas lie at the heart of the sustainable use concept. One is that the resources are renewable. All living resources are renewable by definition, but some resources are more renewable than others. In the language of economics, the interest rate varies. The other idea is that people can balance their consumption with resource production. Spend the interest, not the principal. "Humanity must take no more from nature than nature can replenish. This in turn means adopting lifestyles and development paths that respect and work within nature's limits." This view optimistically generalizes the concept of the noble savage to all of humankind—"Living sustainably depends on accepting a duty to seek harmony with other people and with nature" (p. 8). Whether such enlightened resource use has ever been a characteristic of human groups is debatable (see for instance Redford 1990). Nevertheless, in the following discussion, I will consider the following question: If natural resources are used sustainably, in a manner acceptable to *Caring for the Earth*, what will be the effect on biodiversity?

To understand sustainable use, one needs to consider three interdependent questions. What will be the impact of human use on the *environment* or the *biological resource*? This considers the ecological sustainability of human activities. What are the *needs* and *aspirations* of resource users? This is a consideration of economic sustainability. Finally, what are the *rights* of different user groups to the resource? This is a social and political consideration.

Ecologically Sustainable Use—Species

Ecologically sustainable activities are defined as those that do not degrade the natural resource. Consider the sustainable harvest of a species. The only requirement for ecological sustainability is that harvest from the population must not exceed the potential yield. Yield is total production subtracting natural mortality. There are therefore many population levels at which any species

can be sustainably harvested. Very small populations, for instance, will have a very small potential yield, but as long as harvest does not exceed that yield, it will be sustainable. There is a population level at which yield is maximized—termed the maximum sustainable use (MSU), maximum sustainable yield (MSY), or maximum sustainable cut (MSC)—and managing populations to this level is the goal of many resource managers.

The extent to which a species can be harvested or used by humans depends in large part on whether it exhibits density compensation: As the density falls, does the species population “compensate” by increasing its rate of increase or rate of growth? If it does, then down to a certain level an exploited population is more productive than an unexploited one; the overall yield is higher. The extent to which populations exhibit density compensation, whether populations grow sigmoidally, and the point at which yield maxima are achieved, remain under examination (Reimers 1975; Caughley 1985; Hall 1988). Nevertheless, some general trends among species are discernible. Species that exhibit strong density compensation tend to have MSY points significantly lower than carrying capacity (Fredin 1984). Species that show weak density compensation, for which densities are determined by interactions with other species, tend to have MSY points close to their carrying capacity (Eberhardt 1977, 1981; Fowler 1981; Smith 1984). As a population will go to local extinction if the number of individuals harvested exceeds the MSY, then any significant harvest of species in this latter category will tend to drive density progressively lower than that which produces MSY, and such use cannot be sustainable.

Use is therefore much more feasible when people are exploiting species that show strong density compensation and have high rates of renewability. Species with these characteristics are much more likely to be found in ecosystems at younger successional stages. On the other hand, it will generally be more difficult to exploit species in complex, mature, high diversity ecosystems because density compensation is minimal in most species. For instance, significant harvests of white-tailed deer in perpetuity is a theoretical possibility, but it is likely that significant harvests of most tropical forest mammal species will systematically reduce their populations. Robinson and Redford (1991a), for instance, point out for the neotropics that “highly seasonal ecosystems [such as the llanos and the altiplano], with low species diversity, are more likely to contain large-bodied [wildlife] species with high densities and intrinsic rates of population increase. These are the species that have traditionally been exploited commercially.” In contrast, “the more species-diverse habitats, such as tropical forests, do not appear to contain single species with high enough densities and rates of population in-

crease to be commercially exploited.” The potential harvest of many species is therefore minimal, and the possibility of human use of such species is limited. For these species, any significant harvest will drive populations to local extinction.

The human use of a species also has a more pervasive effect on overall biological diversity. Species occur as parts of biological communities, and harvest will have ramifications throughout the community. Larkin (1977), in an influential critique of MSY thinking in modern fisheries, argued that the unpredictability of fish stocks derived in part from managers ignoring the role of the target species in fish communities. Redford (1992) has pointed out that human hunters in tropical forests take the large bird and mammal frugivores, a preference that must affect seed dispersal and predation of the tropical trees, as well as removing the prey base of the large forest predators. Any exploitation of a species will remove a part of a biological community, with concomitant effects on community dynamics and ecosystem functioning.

Species therefore can be exploited sustainably, but requiring sustainability does not prescribe the intensity of exploitation. One must also specify a minimum population level that is acceptable, and this presumably is defined by the requirements of population viability and by the importance of the species as part of its biological community. Any use of a species however is likely to encourage the overall loss of biological diversity.

Ecologically Sustainable Use—Biological Communities

Ecologically sustainable activities at the level of the biological community are defined as those that do not degrade the capacity of that community to sustain human beings. One must recognize however, that any use of a biological community will ultimately involve a loss of biological diversity. While one can naively imagine human beings in the modern world living as part of a natural community, taking, as envisioned in *Caring for the Earth*, “no more from nature than nature can replenish,” humans will always encourage desirable species and remove competitor species, and all human groups have the capacity to change their environments radically.

This point can be illustrated by considering again a tropical forest. The forest itself could be managed, it could be used for swidden agriculture, or it could be converted for intensive agriculture. These represent increasing human manipulation of the community, increasing external inputs, and increasing the carrying capacity of humans. All are conceivably sustainable. But each has a different effect on biological diversity.

Extraction of forest products, practiced throughout the tropics, represents the lowest level of forest manip-

ulation. The net result of such activities is a loss of forest species (e.g., Anderson 1990), but humans can sometimes make a living from the forest, although usually at only subsistence levels (Fearnside 1989). Increased human manipulation of the forest is represented by swidden (or slash-and-burn) agriculture. Over the long-term, such agriculture can have a significant impact on species composition in the forest (Gómez-Pompa & Kaus 1990), but these activities certainly can be sustainable and support more people over the long term (Flowers et al. 1982). Finally, intensive agricultural production in tropical forest ecosystems (Vasey 1979) represents the most intrusive use. Pedro Sanchez and his colleagues (e.g., Sanchez et al. 1982) have been major proponents of the position that the technology is available, and the economics amenable to developing intensive and sustainable agriculture on tropical forest soils. The method requires removal of tropical forest, burning, and significant application of fertilizer and pesticides. These activities could also constitute sustainable use, and as such would be totally compatible with the *Caring for the Earth's* goals, and should be promoted in a sustainable society. But a tropical forest has a much higher biological diversity than a maize field, even though the latter can support more people with a higher quality of life (as defined in *Caring for the Earth*).

The point therefore is not that a tropical forest cannot be sustainably used—any intensity of use is potentially ecologically sustainable. The more intense the human use of a forest, however, the greater will be the loss of biological diversity. This statement is not at variance with the observations that biological diversity is frequently higher in communities subject to “intermediate disturbance” (Connell 1978)—the range of disturbances resulting from human activities is on an altogether greater scale.

Socioeconomically Sustainable Activities

Economically sustainable activities are defined as those that meet the economic needs and aspirations of the human users. The level of use of a species or a biological community, however, also varies with the identity of the human users. Different human users require different levels of use to meet their economic needs. Accordingly, any plan of sustainable resource use needs to specify the human consumers. Who will use the natural resources? Is it the indigenous groups, local communities, local landowners, regions, an entire nation, or foreign countries? The decision to allocate rights to the resource is usually based on social, political, and perhaps ethical criteria. And it is a decision to empower specified social groups or classes. Socioeconomically sustainable activities therefore are those that meet the economic needs and aspirations of those users who have been allocated rights to those resources.

Identifying the human consumers of natural resources also requires considering other socioeconomic or political groups. The needs and interests of these groups frequently contradict those of the direct users. The socioeconomic sustainability of resource use therefore will depend on the conflicts of interests and/or synergistic effects *among* local communities, businesses, and national institutions (Robinson 1990). Most discussions of sustainable use assume that it is in the interests of all social groups that resource use be sustainable. This is frequently not the case. For instance, the decision, at the national level, to create rubber “extractive reserves” in western Brazil—areas managed by local communities and reserved for specific resource extraction—is commonly trumpeted as a successful approach to sustainable resource use (e.g., McNeely 1988). But the applicability of this approach depends on the political power of the rubber tappers union, the interests of local cattle ranchers, the market demand for their products, the ability of local communities to get their products to the market, to name a few considerations (see Browder 1992). The international political and economic structures will also have an impact on the long-term viability of such extractive endeavors (Redclift 1987). Until these influences are understood, it is unclear whether a resource use will be socioeconomically sustainable. In isolation, a local community might be able to meet their socioeconomic needs, but when national or international politics or markets are considered, they might be unable to do so.

Ecologically Sustainable Socioeconomic Activities

Ecologically sustainable socioeconomic activities are those that are both ecologically and socioeconomically sustainable. Both types of sustainability must be considered because each alone does not specify an intensity of use. In the case of ecological sustainability, one must also define an acceptable loss of biodiversity or environmental degradation. For socioeconomic sustainability, one must also define the consumer group that is the beneficiary of the resource use and consider the interaction with other human interest groups. *Sustainable use only occurs when the rights of different user groups are specified, when human needs are met, and when the losses in biodiversity and environmental degradation are acceptable.*

The history of natural resource use in modern times bears witness to the frequency that resource potential and human needs are incompatible. Even systems like marine fisheries, which are highly productive and heavily managed, have been consistently exploited, and stocks of many economically important species are today highly precarious (How to fish 1988). Tropical forest management may be even more difficult. The failure of management efforts like the Tropical Forestry Action

Plan (TFAP) and government fora like the International Tropical Timber Organization (ITTO) have been notably unsuccessful at stopping tropical forest loss (Empire of the Chainsaws 1991; Vincent 1992). In most cases, the economic constraints on the user groups force this overexploitation (Clark 1973a, 1973b; Larkin 1977). In other words, catches and cuts that are ecologically sustainable do not meet the socioeconomic needs of the users.

With many types of resource extraction under many different socioeconomic conditions, sustainable use will be impossible. This conclusion contrasts with *Caring for the Earth*, which believes as an article of faith that sustainable use is always possible. The failure to use resources sustainably is viewed by *Caring for the Earth* as being a consequence of poor planning, inefficient bureaucracies, inappropriate institutions, and the unthinking waste of human and financial resources. Once people are enlightened, and with appropriate intellectual input, then any resource can be used sustainably (see Chapter 6). *Caring for the Earth* promotes a utopian vision in which belief in sustainable use promotes sustainable use. Unfortunately, there are real contradictions underlying the frequent failure to use resources sustainably.

My discussion has focused on the theoretical constraints of the sustainable use concept. I have not addressed the practical and a management issue inherent in the sustainable use concept. It remains an open question whether we have the management capacities or can develop appropriate economic incentives (McNeely 1988) to ensure that use is sustainable, even in those cases in which it is possible (see Robinson & Redford 1991c). I have also not discussed the danger that advocating sustainable use will give a green light to unsustainable exploitative use. Resource extraction schemes are proliferating everywhere, and most advertise themselves—without justification—as sustainable. Instead I have restricted my discussion to limitations inherent in the concept itself.

Conclusion

Caring for the Earth presents us with a simplistic vision of development and conservation. Critical concepts, such as human “quality of life” and “carrying capacity” are loosely used. There is confusion between the concept of sustainability and that of ecological equilibria. There is a failure to distinguish ecological from socioeconomic sustainability, and the necessary relationship between these two types of sustainability—a relationship that defines sustainable use—is never explored. *Caring for the Earth* places no limits on the loss of biodiversity that is acceptable, neither does it acknowledge that different human consumers have different in-

terests and needs. The result is that the process of socioeconomic development is never examined critically, and sustainable development appears to be easily attainable. While positive thinking is praiseworthy, there must also be a reality check.

Caring for the Earth is also limited in its vision, focusing as it does almost exclusively on human beings. It is concerned with improving the quality of life of people. This is a worthy goal, but it is not the same goal as conserving the full spectrum of biological diversity. Because of this anthropocentric orientation, *Caring for the Earth* emphasizes sustainable use of natural resources as the only approach to conserving natural systems. Sustainable use is a powerful approach to conservation (see Robinson & Redford 1991c), but it is not the only one. Many species and biological communities will be lost unless they are protected and managed with the express goal of their conservation. Sustainable use is very appropriate in certain circumstances, but it is not appropriate in all. It will almost always lower biological diversity, whether one considers individual species or entire biological communities, and if sustainable use is our only goal, our world will be the poorer for it.

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