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### Record: 1

**Title:** Taming the wilderness myth.  
**Authors:** Gomez-Pompa, A.  
Kaus, A.  
**Source:** Bioscience; Apr92, Vol. 42 Issue 4, p271, 9p, 2bw  
**Document Type:** Article  
**Subject Terms:** \*NATURE  
**Abstract:** Reports that environmental policies and education reflect a collective perception of nature, the consolidation of what is held to be true about the natural world and what is necessary to pass on to future generations. Western concepts of wilderness; Alternative perceptions and conservation practices; Scientific findings on human habitation of every part of the globe; Anthropogenic fires in natural-resource management; Alternative views of the environment.  
**Full Text Word Count:** 7870  
**ISSN:** 0006-3568  
**Accession Number:** **9206293502**  
**Persistent link to this record:** <http://search.epnet.com/login.aspx?direct=true&AuthType=cookie,ip,url,uid&db=aph&an=9206293502>  
**Cut and Paste:** <A href="http://search.epnet.com/login.aspx?direct=true&AuthType=cookie,ip,url,uid&db=aph&an=9206293502">Taming the wilderness myth.</A>  
**Database:** Academic Search Premier

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## TAMING THE WILDERNESS MYTH

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### Environmental policy and education are currently based on Western beliefs about nature rather than on reality

Despite nearly a century of propaganda, conservation still proceeds at a snail's pace; progress still consists largely of letterhead pieties and convention oratory. on the back forty we still slip two steps backward for each forward stride. The usual answer to this dilemma is "more conservation education." No one will debate this, but is it certain that only the volume of education needs stepping up? Is something lacking in the content as well?

Aldo Leopold (1966,p. 222-223)

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Never before has the western world been so concerned with issues relating to humankind's relationship with the environment. As concerned members of this industrialized civilization, we have recognized that humanity is an integral part of the biosphere, at once the transformer and the self-appointed protector of the world. We assume that we have the answers. We assume that our perceptions of environmental problems and their solutions are the correct ones, based as they are on Western rational thought and scientific analysis. And we often present the preservation of wilderness as part of the solution toward a better planet under the presumption that we know what is to be preserved and how it is to be managed.

However, we need to evaluate carefully our own views of the environment and our own self-interests for its future use. Until now, a key component of the environmental solution has been left out of our conservation policies and education. The perspectives of the rural populations are missing in our concept of conservation. Many environmental education programs are strongly biased by elitist urban perceptions of the environment and issues of the urban world. This approach is incomplete and insufficient to deal with the complex context of conservation efforts at home and abroad. It neglects the perceptions and experience of the rural population, the people most closely linked to the land, who have a firsthand understanding of their

surrounding natural environment as a teacher and provider. It neglects those who are most directly affected by the current policy decisions that are made in urban settings regarding natural resource use. It neglects those who feed us.

Environmental policies and education reflect a collective perception of nature, the consolidation of what is held to be true about the natural world and what is necessary to pass on to future generations. And this perception underlies and shapes the visions of alternative actions and appropriate actions formed by individuals and conservation groups. How accurate and sound is this vision? our perceptions and knowledge of the environment are based on common beliefs, basic experience, and scientific research. Through time and generations, certain patterns of thought and behavior have been accepted and developed into what can be termed a Western tradition of environmental thought and conservation.

## Western concepts of wilderness

Traditional conservationist beliefs have generally held that there is an inverse relationship between human actions and the well-being of the natural environment. The natural environment and the urban world are viewed as a dichotomy and the concern is usually focused on those human actions that negatively affect the quality of life by urban standards. Mountains, deserts, forests, and wildlife all make up that which is conceived as "wilderness," an area enhanced and maintained in the absence of people. According to the 1964 US Wilderness Act, wilderness is a place "where man himself is a visitor who does not remain." These areas are seen as pristine environments similar to those that existed before human interference, delicately balanced ecosystems that need to be preserved for our enjoyment and use and that of future generations. The wilderness is valued for its intrinsic worth, as places of reverence for nature, as sacred places for the preservation of the wilderness image (Nash 1988).

Wild lands are also seen as areas useful to modern civilization. They are presented to the public as natural resource banks of biodiversity that merit protection from human actions and as outdoor laboratories that deserve unhindered exploration by the scientific community. And they are seen as a vital part of the environmental machinery that must be maintained to provide an acceptable quality of life in developed areas, as exemplified by current concerns about air pollution, global climate change, and deforestation. All of these concepts fall under the general term conservation, yet they represent mostly urban beliefs and aspirations. All too often they do not correspond with scientific findings or first-hand experience of how the world works.

In addition, the validity of widely accepted environmental truths needs to be challenged, from our belief in the virgin nature of the tropical forests to our newly developing thoughts on global warming. Scientific findings are often accepted as if they are the gospel word. But a scientific truth is really a conclusion drawn from a limited data set. It is an explanation of what scientists know to date about a topic, based on their training and interpretation of the information available. It may be replaced by another truth in light of new information that does not fit the old paradigm.

Concepts of climax communities and ecological equilibrium, for example, have been used for most of this century as a basis for scientific research, resource management, and conservation teaching. As long-term studies are analyzed and their findings tested against the old truths, the previous paradigms are being challenged (see Botkin 1990). Today, few ecologists defend the equilibrium and climax concepts. Nonequilibrium models now influence ecological theory, and nature is increasingly perceived as being in a state of continuous change. Some changes are in part random and independent of each other, whereas others are human-induced.

Other accepted truths relating to the environment are myths about nature that come from nonscientific sources. For instance, the concept of wilderness as an area without people has influenced thought and policy throughout the development of the western world (Manning 1989, Nash 1967, Stankey 1989, Whyte 1967). People see in the wilderness a window to the past, to

the remote beginnings of humankind long before the comforts of modern life. We wish to set aside and preserve that which both reminds us of our place in evolutionary time and contrasts with our beliefs of human nature. Yet, recent research indicates that much wilderness has long been influenced by human activities (see Gomez-Pompa and Kaus 1990). The ongoing public conversation about the environment is grounded in the ancient dichotomy of man versus nature. So far we have sought to resolve the argument through a series of truces-either sequestering large tracts of wilderness in a state of imagined innocence, say, or limiting the ways in which man can domesticate nature's imagined savagery (Pollen 1990, p. 24).

The Western world has also seen the wilderness as a challenge, a frontier to be tamed and managed. Agricultural landscapes are often admired for their intrinsic beauty, as living masterpieces created by human hands from the wild. They are confirmation of an underlying belief in human technological superiority over primal forces. It confirms our faith in our ability to manage the environment, a legacy from the Industrial Revolution rooted in the concept of progress and a biblical notion of human dominion over nature. In Genesis (1:28), God says to Adam and Eve, "Be fruitful, and multiply, and fill the earth, and subdue it."

The danger is that this theoretical delineation between the realms of civilized and wild, of the intrinsic value of each realm separately, and of human mastery over natural forces, has only too tangible consequences. Emerging from Western history and experience in temperate zones, a belief in an untouched and untouchable wilderness has permeated global policies and politics in resource management from the tropics to the deserts, causing serious environmental problems.

We must begin to challenge some of our most fundamental and contradictory beliefs regarding the natural environment: the scientific capacity and knowledge available to harness and manage nature the way we see fit, and the perceived pristine state of uninhabited areas. Both beliefs, combined with the concept of the balance of nature, have led to unrealistic and contradictory tenets in our natural-resource management policies. On the utilitarian side, these policies are permeated with an acceptance of destructive practices, generated from a belief that mitigating measures can halt or reverse environmental depletion and degradation. Yet, on the preservationist side, conventional resource-management policy also includes practices based on the belief that setting aside so-called pristine tracts of land will automatically preserve their biological integrity. Neither belief takes into consideration the possibilities for natural-resource management that might arise from the integration of alternative environmental perceptions and current scientific information.

## Alternative perceptions and conservation practices

The concept of wilderness as the untouched or untamed land is mostly an urban perception, the view of people who are far removed from the natural environment they depend on for raw resources. The inhabitants of rural areas have different views of the areas that urbanites designate as wilderness, and they base their land-use and resource management practices on these alternative visions. Indigenous groups in the tropics, for example, do not consider the tropical forest environment to be wild; it is their home. To them, the urban setting might be perceived as a wilderness.

As a city dweller never looks at bricks, so the Indian never looks at a tree. There are saplings for making bows, and jatoba for making canoes, and certain branches where animals like to sit, but there are never trees noticeable for self-conscious reasons-beauty, terror, wonder (Cowell 1990, p. 2s).

Many agriculturalists enter into a personal relationship with the environment. Nature is no longer an object, an it, but a world of complexity whose living components are often personified and deified in local myths. Some of these myths are based on generations of experience, and their representations of ecological relationships may be closer to reality than scientific knowledge. Conservation may not be part of their vocabulary, but it is part of their lifeway and their perceptions of the human relationship to the natural world.

Throughout the world, communally held resources have been managed and conserved by diverse human societies via cultural mechanisms that attach symbolic and social significance to land and resources beyond their immediate extractive value (see Feeny et al. 1990, McCay and Acheson 1990). In the Brazilian Amazon, the Kayapo belief system and ecological management, as described by Posey (1983), revolves around maintaining an energy balance between the natural and spiritual world by regulating animal and plant use via ritual and custom. Indigenous fishermen of Northern California used to place a ritual moratorium on fishing during the first few days of the salmon runs, thereby protecting the perpetuation of the salmon resource and maintaining intergroup relations along the river (Swezey and Heizer 1982).

External economic and political demands for natural resources have placed conflicting demands on land and resources maintained by local inhabitants. Often backed by powerful government or corporate business interests, conflicting perceptions of how the land and resources should be used have led to the replacement or collapse of previous resource management systems and subsequent unrestricted or uneducated use of the region. In Chiapas, Mexico, for example, the Lacandon Maya perceived the forest as the provider of subsistence. Forests were converted temporarily to agricultural lands for corn, beans, and squash within a shifting cultivation system, or the forest fallows managed to attract wildlife (Nations and Nigh 1980). Before the entry of outsider groups with other objectives and other interests, Maya people lived within the tropical ecosystem of southern Mexico and Guatemala for centuries in ways that allowed continuous forest regeneration. Yet, the majority of Maya groups that inhabited the Lacandon forest were never consulted in the government policy decisions of land use that

ultimately led to its destruction.

These same lands have been, and still are, viewed from the outside as lands to be conquered, colonized, grazed, or preserved. The forests contain hardwoods valuable on the international market. The cleared forest then provides land for the landless and pastures for the cattle industry. Deforestation is not perceived as a problem by the representatives of these interests but rather as a mechanism by which to gain land tenure rights. Traditional conservationists, on the other hand, see the aesthetic, biological, and ecological value of the same land but do not necessarily see the people. They often fail to see the effects of past or current human actions, to differentiate among types of human use, or to recognize the economic value of sustainable use.

The well-known cycle of initial lumber or mineral extraction followed by colonization, land acquisition, and subsequent conversion to pasture lands has been a common denominator in most of the American tropics (Myers 1981). Though we tend to focus on the actions of the local people, on what is immediately observable, such actions are often the result of higher-level policies, such as government concessions to extractive industries (Parsons 1976, Partridge 1984, Repetto 1990).

Even with the documentation of this cycle, even with the evidence that it is our own outside interests that are ultimately responsible for the greater part of tropical deforestation, we continue to place the blame on poverty and on the land practices of the rural sector when they are only the visible symptoms of much deeper underlying problems. More important, our beliefs and assumptions blind us to the fact that, in many cases, the traditional land-use practices of the rural sector are responsible for maintaining and protecting the biodiversity of our wilderness and have often provided the genetic diversity that strengthens the world's major food crop varieties (Altieri and Merrick 1987, Brush 1986, Nabhan 1985, Oldfield and Alcorn 1987, Reganold et. al. 1990).

## **Footprints in the wilderness**

Scientific findings indicate that virtually every part of the globe, from the boreal forests to the humid tropics, has been inhabited, modified, or managed throughout our human past (Gomez-Pompa 1987, Kunstadter 1978, Lundell 1937, Parsons 1975, Sauer 1958). Although they may appear untouched, many of the last refuges of wilderness our society wishes to protect are inhabited and have been so for millennia. In any current dialogue regarding tropical forests, for instance, the Amazon Basin is usually mentioned as a vital area to be left untouched and protected. Yet, archaeological, historical, and ecological evidence increasingly shows not only a high density of human populations in the past and sites of continuous human occupation over many centuries but an intensively managed and constantly changing environment as well (Anderson and Posey 1989, Balee 1989, Denevan 1976, Hartshorn 1980, Hecht and Cockburn 1990, Roosevelt 1989).

The Amazon is still the homeland for many indigenous groups who have inhabited the area since long before the arrival of Europeans, and it contains the resources on which they and other nonindigenous people depend for their livelihood. The Kayapo of Central Brazil currently occupy a two-million hectare Indian reserve, but at one time they practiced their nomadic agriculture in an area approximately the size of France (Hecht and Cockburn 1990, Posey 1983). In addition, new evidence from the Maya region suggests that the seemingly natural forests we are trying to protect from our version of civilization supported high densities of human populations and were managed by past civilizations.

Present-day parks, reserves, and refuges in the region are filled with archaeological sites. According to Turner (1976), the Maya population of southeastern Mexico may have ranged from 150 to 500 people per km in the Late Classic Period, contrasting sharply with current population densities of 4.5 to 28.1 people per km<sup>2</sup> in the same region (Pick et. al. 1989). These past civilizations apparently managed the forests for food, fiber, wood, fuel, resins, and medicines (Gomez-Pompa 1987). Many of the tree species now dominant in the mature vegetation of tropical areas were and still are the same species protected, spared, or planted in the land cleared for crops as part of the practice of shifting agriculture (Gomez-Pompa and Kaus 1990).

It is only relatively recently that research on shifting agriculture and other tropical production systems has started to change from its previous focus on the initially cleared field to an examination of the management of the fallow after abandonment of the area for annual crops. The current composition of mature vegetation may well be the legacy of past civilizations, the heritage of cultivated fields and managed forests abandoned hundreds of years ago. Our late realization of this possibility stems from the long-held belief that only cleared and planted areas are managed, as in the ploughed fields of our experience, and that mature vegetation represents a climax community, a stable endpoint reflecting the order of nature given no human interference. Until we understand and teach that the tropical forests are "both artifact and habitat" (Hecht 1990), we will be advocating policies for a mythical pristine environment that exists only in our imagination.

As our knowledge and understanding of the anthropogenic influence on the composition of mature vegetation increases, it is necessary to redefine and qualify what is meant by undisturbed habitat. The issue is not simply the presence or density of humans, but the tools, technologies, techniques, knowledge, and experience that accompany a given society's production system. The ancient societies discussed previously, for example, were more closely bound to the local environment and more dependent on regional resources for basic subsistence. Increased productivity would have come from principally internal modifications and increased human labor for more intensive ecosystem management. Production systems that were viable

remained; those that failed disappeared.

In contrast, modern production systems have advanced technologies, from chemical fertilizers to hydroelectric dams, that are external to the local environment. These technologies have the potential to impose irreversible transformations on the environment that cannot be predicted by traditional knowledge (i.e., cumulative knowledge specific to the local environment). What is recognized by the environmental and conservation movements is an ability to destroy the environment at a much greater scale than ever before in human history. When we speak of protecting undisturbed habitat or wilderness, then, it is important to clarify that the word undisturbed refers to the absence of disturbance by modern technologies.

However, not all modern societies use destructive technologies, and the benefits of human interference in ecological processes are not restricted to tropical zones or past times. Presentday farmers in remote areas all over the world have managed, conserved, and even created some of the biodiversity we value so highly (Alcorn 1990, Felger and Nabhan 1978, Gliessman et. al. 1981). In the Sonoran Desert, a study of two oases on either side of the Mexico-United States border indicates that the customary land-use practices of Papago farmers on the Mexican side of the border contributed to the biodiversity of the oasis. In turn, the protection from land use of an oasis 54 km to the northwest, within the US organ Pipe Cactus National Monument, resulted in a decline in the species diversity over a 25-year period (Nabhan et. al. 1982).

In addition, many rare varieties and species related to our major food crops can be found maintained within or bordering agricultural fields in cultivated regions. In the Sierra de Manantlan (Jalisco, Mexico), the discovery of a new perennial corn, *Zea diploperennis*, led to the establishment of a biosphere reserve to protect this species and the ecosystem in which it survives (Iltis 1988). (Biosphere reserves are part of an international reserve system established by the UNESCO Man and the Biosphere Program, which contain zones of human use within the overall management agenda; theoretically, a biosphere reserve integrates the goals and strategies of conservation, development, research, and education.) The difficulty is that *Z. diploperennis* is a secondary species that grows in abandoned cornfields. To protect the species, the slash-and-burn techniques of this form of traditional agriculture have to be continued to provide the habitat that it requires. Without all the human cultural practices that go with the habitat, the species will be lost forever. Yet, this dimension of conservation has been neglected in our own tradition of natural-resource management.

## **Anthropogenic fires in natural-resource management**

It is of utmost importance to understand both the beneficial and destructive ecological consequences of anthropogenic perturbations and to incorporate this knowledge in research and education programs. Future scientists, leaders, farmers, fishermen, and ranchers need to be exposed to alternative views and taught to see natural environmental issues within their historical, social, and cultural contexts. The view of the white ashes of forest trees that have been felled and burned for an agricultural plot may appear to an urbanite outsider to be a desecration of the wilderness, but a farmer may see it as an essential stage of renewal. One could argue that the trees felled are the representatives of rare and endangered species, and, in selected sites, this argument might be reasonable. However, most often, many of the cut or burned trunks resprout, providing the bulk of the new forest.

Slash-and-burn agriculture has been an integral part of the tropical forests ecosystems for millenia. This ancient form of agriculture is not to be confused with the widespread destructive fires set by recent colonists or squatters who have little local experience or land-tenure security. Fire is today used to open new forest land, often on the edge of new timber or mining roads, or, even worse, used as a mechanism to vent anger at the impotence of poverty and inadequate government programs. Though such rapid clearing of the forest by landless peasants is also improperly referred to as slash-and-burn or shifting agriculture, in reality the planted areas are not fallowed, but successively replanted and eventually abandoned. This sequence is very different from the continual process of clearing, planting, and fallowing that is typical of more long-standing forms of shifting agriculture, which creates a mosaic of different ages of forest growth, including large patches of mature vegetation.

To give a concrete example, when a major forest fire in 1989 burned 120,000 hectares near Cancun, Mexico, the news media conveyed an image of ecocide, covering the fire's daily progress with statements about the extinction of species and the loss of invaluable forests. Environmentalists, conservationists, and most nongovernmental organizations connected to environmental issues protested the lack of any fire management plan to prevent, stop, or control forest fires. Yet, no attempt was made to understand why a fire of this magnitude had occurred in the first place.

The Cancun fire began in several different places at the same time, and its cause remains unclear. It is unlikely that it was the result of an agricultural fire that escaped from an area cleared for crops. In all of the tropical Maya region, no official form of fire control has ever existed beyond that of the individual farmers. Yet, fires have seldom been as large or extensive as this one. Agricultural fires are carefully controlled by the farmers. One of the most critical decisions they must make is when to burn the slash: when the conditions are finally dry enough, but before the first seasonal rains. The farmers know the winds, the annual climatic shifts, and past fire histories. They know how to control the size and intensity of their fires to protect the neighboring forests from burning.

The patchy mosaic of forests, forest fallows, and agricultural plots is an ideal landscape for controlling forest fires. The view

from a helicopter flying over the burned area around Cancun revealed that the line of fire had stopped in areas of slash-and-burn agriculture (Figure 1). Local residents and forest authorities say that the forest burned most dramatically in areas where the valuable woods had been mined out and been subsequently devastated by Hurricane Gilberto.<sup>(n1)</sup> The actual commercial and biological value of the forest was low. Biological surveys indicate that the burned zone was in fact not rich in endemic organisms (Lopez Portillo et. al. 1990).

Although Mexico contains a multitude of unique sites in which rare and endangered species are truly threatened, these sites have not received the same visibility in the public consciousness as did the Cancun fire. But neither are they situated so close to a major international tourist location. The concern over the Cancun fire was due to a desire to have an attractive forest landscape for the increasing tourist trade in the area. This concern is not necessarily invalid, but the entire fire coverage was presented out of context and based on unfounded arguments (Lopez Portillo et. al. 1990). The underlying problem was the general lack of understanding of the ecological processes that shape forests and landscapes. We confuse all too easily the great need to protect rare and endangered species with the protection of wilderness, and we confuse our admiration of forests with the conservation of nature.

Cancun is not an isolated example. ongoing research on the chaparral environments on both sides of the Mexico-United States California border has shown the role of fire in combatting fire (Minnich 1983, 1989). These studies indicate that the mosaic vegetation pattern in Baja California, the result of repeated small burns, has prevented the large catastrophic burns so characteristic of the equivalent ecological zone in Southern California. The composition and structure of so-called virgin forests and wilderness areas are in part artifacts of previous burns, both natural and anthropogenic (Komarek 1973, Savonen 1990, Thompson and Smith 1971). A policy of fire suppression in the United States has eliminated natural barriers to fires. Fire control in wilderness areas, from the big trees of California to the Northern and Northeastern forests, has also led to undesirable changes in their environments (Botkin 1990, Heinselman 1971, Kilgore 1973, Wells 1969, Wright and Bailey 1982).

Due to our limited knowledge of the role and experience of local human populations in managing fire, fire suppression remains the dominant policy in our management of natural resources and many national parks. We fear, and are trying to prevent, a repeat of the 1988 fire in Yellowstone National Park without fully understanding the underlying causes for its great extent, intensity, and damage. In addition, without the knowledge of the role of fire in a given ecosystem, we have developed areas so that they can no longer be subjected to prescribed burns without great risk. Yet, in so doing, these areas are also at risk from fires that cannot be controlled once they start.

## **The integration of alternative views of the environment**

The differences between the perceived and actual environmental effects of forest fires, fire suppression, shifting agriculture, or preservationist policies are only a few examples of the contradictions and confusion that exist in connection with environmental issues and conservation. In the city or in the rural areas, inaccurate information is passed from our own education system to the rest of society and the next generations of environmental users, managers, and abusers. Research and education programs need to be redesigned to inform urban as well as rural populations (from children to adults) about appropriate and alternative resource management practices and policies. Most policy agendas and education curricula neglect rural perceptions of the environment or traditional systems of food production and resource management. They do not address the current difficulties confronted by these systems and lifeways or their contributions to conservation and our own survival. Beyond opening our eyes to the realities of the areas we call wilderness, we must learn how to listen to their caretakers (both good and bad ones) to include local needs, experience, and aspirations within our perspectives (GomezPompa and Bainbridge in press).

To adjust our recommendations for better use of the environment to reflect reality rather than myths, we must learn how local inhabitants in rural areas understand their environment and must bring this vision into both the urban and rural classrooms. The first step is to recognize that conservation traditions exist in other cultural practices and beliefs that are separate from Western traditional conservation. The rural sector is not a homogeneous group, however, and research and education efforts also need to be directed toward the social or economic constraints and incentives that lead to destructive practices or conflict with institutional conservation policies.

Several priorities for research and education programs can be mentioned to improve the information and alternatives available for natural resource management programs and future resource managers:

Research on the influence of human activities on past and present environments to understand the influence of all forms of management, whether modern or traditional, intensive or extensive, on the shape and content of the environment.

Long-term monitoring of environmental change that includes the social and economic variables affecting such change.

Documentation of the views and perceptions of nature and conservation found in rural populations and integration of these beliefs and corresponding empirical realities in the general pool of collective knowledge. Knowledge of the beliefs, constraints, and aspirations of local residents in ecologically fragile lands will aid in coordinating conservation and rural development policy

and practice.

Continued emphasis on the coordination of research efforts in different scientific disciplines to present conservation and management alternatives with balanced representations of the different interests in conservation and rural development.

Collaboration with interested individuals in the rural sector to establish demonstration and experimental sites for resource management alternatives and environmental restoration techniques.

Development of environmental educational programs that integrate the knowledge and experience of scientists, educators, and local practitioners. This development should include programs that not only take scientists and educators out to rural communities, but also that encourage rural residents with successful land-use techniques to teach, whether in their own communities, other rural areas, or the urban setting.

Development of graduate programs in conservation and natural-resource management that train a new generation of professionals, scientists, and decision makers with a view of conservation issues that includes the role of humans in both environmental deterioration and enrichment. These programs need to instill a sense of the tremendous responsibility current and future generations have to shape our own environment and of the risks of failing.

We have reached a time where the lines are not drawn between the known and unknown but between belief systems. This situation leads to an unfortunate set of circumstances in which we divide ourselves on issues where our opponents are not villains. They are often others who, like us, are working toward the protection of the environment. Yet, we line up behind the banners of preservation, conservation, development, or restoration and then subdivide on points of human involvement, responsibility, and equity in resource management. The only realities left between these polemics are the resources and the people who use them. This middle ground is where future research and education needs to be concentrated if we are to emerge from this seeming morass of controversial arguments held at a level far removed from the field.

As scientists or conservationists, we need to enter the field, literally. We speak of local participation and of developing a dialogue among the rural, research, and education communities. However, the presence of local residents in a classroom or conference hall does not necessarily engender participation. These locations and procedures are a standard part of our own traditional education process; they are unlikely to be familiar to the majority of indigenous or remote communities and unlikely to be conducive to an exchange of information among researchers and local people.

We sometimes forget that experience is often the best teacher and place great emphasis instead on the letters that proceed or follow a person's name, on the way that person talks, and on the material he or she writes. In so doing, we have created a barrier of formally structured education and language that is imposing to rural populations. One rancher from North Mexico once commented on the researchers with whom he had worked, "We tell them what it is like here, but they write about it differently."(n2)

We know, in fact, very little about how environmental knowledge held by farmers, ranchers, fishermen, hunters, and gatherers from the deserts to the tropics is passed from one generation or society to another. This understanding requires learning the setting and language that people use to describe their environment and their relationship with the land. It implies understanding the underlying concepts of their words and the corresponding actions that are considered appropriate. Such environmental perceptions may not exactly match concepts of sustainable use or restricted access to limited or fragile resources, but overlaps of conservation concepts and practices do exist.

In an informal survey,(n3) 15 people of a remote region of Durango, Mexico, were asked what the word *conservacion* meant. None of them knew. "No," they replied, shaking their heads. "Que sera? (What would it mean?)" Earlier, one man from this group had pointed out ways in which he and his family were trying to protect the rangeland from the effects of drought and overgrazing and to protect the wildlife from poachers. When asked why, he turned in his saddle, viewing the range stretching away from him into the distance, and said, "Hay que cuidar, verdad? [You've got to care for it, don't you?]"

A shared perception of caring for the land can be emphasized in conservation policy and education. However, integrating this perception requires acknowledging the presence of humans in wilderness areas. Part of the problem in working with local people stems from our perception of wilderness as uninhabited. The attention automatically falls on the land first and the people second. We think of local people living in the buffer zone surrounding an uninhabited area and do not stop to consider that perhaps the buffer zone should be the principal area of conservation.

Botkin (1990) describes how resource management policies to both protect and control elephant populations in the Tsavo National Park of East Africa led to a severe deterioration of the land within the park boundaries. The inhabited area surrounding the park remained forested. The clear demarcation of the boundaries in the LANDSAT images and aerial photos appeared "as a photographic negative of one's expectation of a park. Rather than an island of green in a wasted landscape, Tsavo appeared as a wasted island amid a green land" (Botkin 1990, p. 16).

Perceptions of wilderness and protected areas as uninhabited means that local-level collaboration is often neglected or

considered only as an afterthought and in terms of our own priorities. We talk easily of the role of local people in our conservation programs but often do not stop to think of the role we play in their lives. Local cooperation, participation, or collaboration are not free commodities. They influence lives and futures and both deserve and require negotiation. In the Chihuahuan Desert, for example, inhabitants in the region of the Mapimi Biosphere Reserve have included a policy of wildlife conservation and an ecological research program within their own lifeway. Their willingness to stop eating the endangered Bolson tortoise, *Gopherus flavomarginatus*, and protect it from poaching has resulted in an increase in population of this endemic species within the reserve. In turn, the researchers have opened a window to another world outside that arid basin by providing a vision of the national importance and value of local resources and efforts.

However, the local-level efforts up to now have not been equal. Some of the local people say they have benefitted the reserve more than the reserve has benefitted them.<sup>(n4)</sup> Why, then, did the local people accept the researchers in the first place? They say it was for *la convivencia*, the willingness of the initial researchers to live and work side by side with them, to accept their help and advice, and to include their concerns in the decision making process. It was a matter of trust. The local people trust that their perceptions, their world, will be part of what is taught to others who have never set foot in the Bolson de Mapimi, part of what is taken into consideration by those who wish to alter either local land use or the reserve management.

## Environmental conservation responsibilities

Cooperative relationships with local residents in ecologically fragile areas are of utmost importance to our understanding of the natural environment and the effects of resource use. Yet, we cannot neglect our responsibilities in such relationships or underestimate the effect (positive or negative) that we can have on a rural community. We need to contribute in turn and impart the information to which we have access. In this way, local people can come to understand their situation in a larger context and make informed decisions about their lives and land. But it also means orienting some of the research toward local benefits and including local-level perspectives in research design and dissemination. More important, it means including the local people in the same education process that we, ourselves, are undergoing to understand the natural environment and society's effects on it.

The benefits of local-level collaboration to our urban communities are perhaps even more than we can realistically offer in return. Perceptions, knowledge, and experience of the rural sector incorporated into the urban classroom can guide our global civilization to more informed decisions about what is termed wilderness and about what is meant by conservation. The wilderness we have envisioned up to this point is not the same when viewed from the field. In reality the frontier does not exist between people and the wild, but between the known and unknown.

The point here is not to create a new myth or fall into the trap of the "ecologically noble savage" (Redford 1990). Not all farmers or ranchers are sages, folk scientists, or unrecognized conservationists. Yet, within the rural sector can be found individuals who directly depend on the land for their physical and cultural subsistence. And within that group of individuals exists a set of knowledge about that terrain, a knowledge of successes and failures that should be taken into account in our environmental assessments. Currently, we are discussing and designing policies for something about which we still know little. And those who do know more have rarely been included in the discussion. The fundamental challenge is not to conserve the wilderness, but to tame the myth with an understanding that humans are not apart from nature.

## Acknowledgments

We would like to thank David Bainbridge and Denise Brown for their timely comments and suggestions and the external reviewers of *BioScience* for their excellent critical assessments and arguments. This article is based on a presentation given at the 19th Annual Conference of the North American Association for Environmental Education, 2-7 November 1990, in San Antonio, Texas. An abstract, in Spanish, of the presentation, "Desafío Al Mito de la Virgindad de los Ecosistemas," was published in the proceedings of the conference's Latin American Symposium, *Estableciendo la Agenda de Educación Ambiental para la Decada de los Noventa*, I. Castillo and A. Medina, editors.

(n1) A. Gomez-Pompa, 1989, interviews.

(n2) A. Kaus, 1990, interviews.

(n3) A. Kaus, 1989-1990, interviews.

(n4) A. Kaus, 1989, interviews.

PHOTO (BLACK & WHITE) : Figure 1. Photograph taken after the 1989 forest fire in the Cancun region of the Yucatan Peninsula shows where the line of fire stopped at the edge of a slash-and-burn agricultural site.

PHOTO (BLACK & WHITE) : The ancient Maya site of Yaxchilan (Chiapas, Mexico) shows the presence of past human civilizations and perturbations in the green wilderness of the Mexican tropics.



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**Source:** Bioscience, Apr92, Vol. 42 Issue 4, p271, 9p

**Item:** 9206293502

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