tural creativity. Without it we will be reduced to making ever-fainter copies of copies, like a Xerox machine. Indeed, wilderness seems to be associated with the very roots of the creative process. It is no accident that artists and scholars use adjectives such as "pathbreaking" and "pioneering" to describe fresh work. They speak of the "frontiers" of knowledge. The unknown is the primary goal to discovery, and classic wilderness is the unknown. Its presence invigorates a culture, in Henry David Thoreau's terms, as fertilizer does a barren, sandy field. Perhaps this is what Thoreau had in mind when he wrote in 1851 that in wilderness is the preservation of the world.

7. The last and least anthropocentric wilderness benefit derives from the very recent idea that nonhuman life and even wild ecosystems themselves have *intrinsic value* and the right to exist. From this perspective wilderness is not *for* humans at all, and wilderness preservation testifies to the human capacity for restraint. A designated wilderness, in this sense, is a gesture of planetary modesty and a way of demonstrating that humans are members, not masters, of the community of life. In the last decade, environmental ethics and deep ecology have called attention to the idea that rights, and ethical obligations, do not end with human-to-human relationships but extend to the farthest limits of nature. Americans, especially, should not find this concept strange because the history of liberalism in the United States has been one of a selected group of white males; we now find the limits of liberalism extended to the rights of nature. In the course of this progression slavery disappeared and now the more radical environmentalists are calling for the end of *land* slavery. Wilderness is the best place to learn humility, dependency and reverence for all life.

From this nonanthropocentric point of view wilderness preservation is truly a radical act. It is indeed subversive to the forces that have accelerated modern civilization to power but now threaten its continuation: materialism, utilitarianism, growth, domination, hierarchy, exploitation. Development and the preservation of wilderness are *not* compatible. If we are going to really have enduring wilderness on earth, we must challenge the growth ethic. In a limited world everything must have limits including human population and civilization. Only cancer cells respect no limits, and in doing so they destroy their habitat and perish. Civilization has cancerous tendencies; wilderness protection is an antidote. Growth, it increasingly appears, is like a drug that can destroy the user. The antidrug slogan on the streets is, "Just say NO." It is time to apply the same logic to growth. The existence of wilderness is the surest sign that mankind has understood this truth and that he is prepared to put his own legitimate demands into ecological balance with those of his fellow travelers on spaceship earth.

In conclusion, let me return to the analogy of the woman who asks, "Why do you love me?" Thinking about the values of wilderness outlined above, try telling her that you worship her, that you cherish the life you have lived together, that she is necessary for your mental welfare, that her presence in your life makes you different, that in her own special way she is beautiful, that she inspires you

to be creative, and that she challenges you and offers you an alternative to the way most other women are in the world. Finally tell her your love is totally disinterested, that you love and value and respect her just because she exists and not for anything she does for you. You love her like the climbers say, "because she is there." You want to protect and nurture her because she has a right to exist. I believe, gentlemen, that this will be a successful response. In the 1980s I think it is called "being sensitive about relationships."

Wilderness appreciation is very new under the sun. The World Wilderness Congress would have been inconceivable a century ago or even 70 years ago when Gifford Pinchot and Theodore Roosevelt called governors together at the White House to discuss the importance of conservation. They meant *utilitarian* conservation and the sustaining of growth and greatness. John Muir, who loved wilderness, was pointedly excluded from the 1907 gathering. Today wilderness has a major place in the world's conservation agenda and Muir's memory is honored, but we still have miles to go before wilderness has a secure, permanent place in all the representative latitudes of this planet. The final fruits of our efforts may not be harvested quickly, and in this connection it is well to recall a story that John F. Kennedy liked to tell when he was president of the United States. It concerned an ancient Chinese monarch who was planning an orchard. Informed that a particular tree would not bear fruit for a century, the wise monarch responded, "In that case, let us plant it this morning!"

In protecting wilderness we are also planting ideas and policies that will be slow in maturing. We should do well, then, to start the process immediately.

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THE AMERICAN STORY

Douglas Scott

The history and organization of the conservation movement in the United States holds lessons and suggestions for similar groups contending with similar issues in other lands.

The origins of the conservation movement in the United States go back a long way. The organizational development of the environmental movement began in the latter part of the last century. The Sierra Club, for example, was organized in 1892 and is now busily planning its centennial. The movement to conserve our environment sprang from nature appreciation, from the movement for scientific resource management. It was inherently elitist, small and primitive. In those early days it neither intended to have mass membership nor was it a political movement. Less than 100 years later, we have an enormously popular movement for the environment in the United States. This movement is aligned with overwhelming public support and public opinion. We enjoy public confidence and we represent and work with literally millions of members from many national and local organizations. We work with a diversity of styles and we have achieved great political and social power in our society.

We are near the end of the Reagan Administration in the United States. In these Reagan years, we have seen proposals for the drilling of oil and gas in our preserved wilderness areas. We have seen proposals for stopping completely the acquisition of additional lands for national parks and wildlife refuges, and the actual cessation of the designation of additional areas of wilderness in this country. We have seen an eager industry lobby, with its friends in the White House, which was confident that it could cut the Clean Air Act and weaken all of its provisions in the Congress. We saw an administration that was intent on blocking toxic substances controls, we saw an administration that had an enormous lack of sense and vetoed the Clean Water Act, which this country needed so badly. We also saw a Congress that overrode that veto with bipartisan enthusiasm in January 1987. This is an administration that would drill for oil on the distant coastal plain of the Arctic National Wildlife Refuge, the largest nature preserve in the circumpolar arctic that remains pristine. Our environmental movement has stopped these initiatives and will stop the drilling proposal in the arctic as well.

The attributes and characteristics of the environmental movement we have in this country derive from our history. We have woven together different issues which a variety of people felt were important.

One is the wise use of resources started by the scientific forestry movement in the last half of the last century. It stopped the exploitation and depletion of our natural resources and stressed management of those natural resources under such concepts as multiple use.

The second is the nature preservation movement. The national parks movement began with the establishment of Yellowstone National Park in 1872 and continued with the designation of wilderness areas and strict nature preserves on our federal lands all across this country. This has been a movement not so scientifically oriented, but instead, prepared to speak with emotion about the value of the land and the wilderness and the wildlife.

A third great theme is the quality of life, which has emerged more in this century, particularly in the post-World War II era. The focus of attention has been pollution control because of the adverse impacts of technology run amok, purely for the sake of industrial development.

All of these approaches brought us to the fourth great theme of our movement, the twentieth-century theme of ecology. This has united all of the approaches under the ideas of limits, choices and self-control in a society clearly prepared and equipped to destroy the entire earth. The movement against nuclear war is a part of the environmental cause.

The development of citizen action in the United States on each of these four separate themes was very similar. Each began with small numbers of people, bold leaders and visionaries who saw the problem and projected it to a larger audience. It takes someone to see the vision and to see the value of the wilderness, as did John Muir, Emerson, Thoreau, the poets and the artists of our nation, to bring the value of what would be lost to the public's attention.

Seeing the problem, we needed to translate it into political action. Leaders such as John Muir, Aldo Leopold and Rachel Carson stepped across that brink to say, "We must act for change." They were evangelists who, along with many others, mobilized public attention to these problems as a way of stimulating political action. We must help educate, train and organize the mass public to affect the decisions of our government and of our other social institutions.

The history of the wilderness designation process in our country is notable as an example of public action. Until 1924, there was no formal designation of wilderness areas. Even through World War II the designation was a matter entirely at the discretion of agency administrators who could change their own minds just as new presidents and new political currents change the administrators. The wilderness areas that were preserved in those early years were exceedingly fragile and endangered.

After World War II, the huge economic machine of this country turned inward to development and to exploitation of resources. The defense of even those few wilderness places that were preserved by action in the 1920s and 1930s became foremost. Dams were proposed all across the great wilderness landscapes of this country, roads punched further up the valleys and into the mountains, and timber cutting and clear-cutting moved higher and higher on the slopes into precious natural areas.

It was clear to the leaders of that era that, although they could fight to stop each dam proposal and to stop each timber sale, they needed a positive weapon. They had the vision to see that they needed to equip society as a whole with tools

that people could use to protect their wilderness areas, whether government would do so or not. That tool was the Wilderness Act. It was not conceived by the bureaucracies of the National Parks Service or the forest service, but by the conservation leaders of the 1940s and 1950s. It took eight long years and an intense battle, the likes of which we had not yet experienced in our movement, to get that simple law passed in the Congress.

When the Wilderness Act was enacted in 1964, it protected nine million acres of land. It was a tool, forged to help all of us to ensure future generations of the ability to take the concept of wilderness and the specific policies for its protection and apply them to additional areas. The time for implementation began in the late 1960s and continues to this day. As of 1987 there are 91 million acres of federally designated wilderness areas in our system; each area is protected by an act of Congress and by an extraordinary exercise of political will by the majority in our country.

Behind each of those wilderness areas is a story of individual people. They did not wait to be rallied by some organization or wait for a call from Washington or San Francisco, but instead sensed that a place they cared about was in danger. These people knew that they were going to have to rise to its defense, mobilize public opinion and use the Wilderness Act to directly pressure Congress to see their area saved. There are ranchers, housewives, teachers, doctors, lawyers, druggists, hardware-store owners and others across this country who know in their hearts that theirs was the voice that saved one of those places that make up the 91 million acres that are protected by law. There are hundreds of thousands of similar people working this very day to continue that fight for the protection of additional wilderness.

The Wilderness Act was a tool because it gave people access. It required something simple but profound—a local, public hearing, the record of which would not stop with the local forest supervisor or the local park superintendent, but would travel to Washington, D.C. and through the maze of the bureaucracy and into the White House itself. Ultimately the record would find its way to Capitol Hill. It did not matter whether or not the agency and the president in power at that time would recommend that area for wilderness or recommend an area large enough. The voice of the people organized in those hearings continued to be used to bring pressure to influence their own congressmen, reaching over the bureaucracy and the politicians in order to say, "We love this place, we know what is best, we know where the lines should be, and we ask you, our elected officials in the Congress, to be responsive to the public opinion."

That is the vision, and it's true in pollution fights or energy fights or the anti-war fight in this country as well. Find tools that give access for ordinary people to influence the processes and decisions of government that otherwise would not be adequate to the challenge we face. We have opened up the U.S. Congress as literally a citizens' hearing board to listen to the complaints of concerned people. We have utilized the courts to great significance and we've created new laws in our society to give citizens a greater handle in court.

For example, the Clean Water Act provides for legal redress. If the law isn't being enforced, anyone can walk into any court in this land and demand that it be enforced. The National Environmental Policy Act forces decision makers to cast up the alternatives and give those alternatives serious public scrutiny. The Right-to-Know provisions in our toxic control laws insist that local communities which will feel the effect of hazardous waste, chemicals and air pollutants be made aware of the chemical soup around them. Awareness is the first step to mobilization.

Americans have learned not to wait for Washington to act. We have developed a system to empower, structure and organize at the grass roots so that people can act. This is a hallmark of the modern environmental movement in this country, not in offices in Washington, D.C. or San Francisco, or a small staff of professional environmentalists, lawyers, scientists and agitators. We have passed that power across our society, organizing networks and communications to people affiliated with each national organization and to the many more people who are not affiliated to the local citizens' group and to the people gathered around a kitchen table, frightened because they've heard the Forest Service is going to allow the cutting of timber just up the valley from their homes. This is the heart and soul of our environmental movement.

The obligation of national organizations and mobilization centers is to organize that power, to train those people to develop their knowledge of the issues and to develop their understanding of our political processes. The skills to influence decisions are not readily available in this society or in many others. What we learned in high school civics is largely irrelevant to the real world of power in Washington and our state capitols. The key element is access to knowledge. Once informed and trained, simple people can affect the decisions that are made.

There are nine lessons which can be summarized from the history of the American conservation movement.

1. Deliberate action is necessary. Government will not act alone, and if it will, it will act too late and not strongly enough. If wild places are to be protected, we must take the initiative. If pollution is to be regulated, we must take control of that process.

2. It is important for groups to specialize, but all must work for the big picture. National park groups must work for clean air. Clean air groups must work to stop the drilling in the arctic.

3. Fit your political action to your society and your system. As a loyal and patriotic member of my own society, I have learned that one must work in the system until its inability to respond has been proven. This has a better payoff, because the system, if you can move it, will move in the direction that you want it to go.

4. Ally yourself with the culture and the literacy of your country. The Sierra Club and other groups, by using all forms of media, have done a great deal to build public support by showing people pictures of the beautiful places at stake and pictures of the ugly things that are being done to them.

5. Avoid elitism and don't get too excited about professionalism. The volunteer, grassroots, ordinary citizen center of our movement is its heart and soul. Be independent. Tie yourself to no political party, ally yourself with no temporary social movement. Work on government rather than in government.

6. Build policies that give tools to the public. Remember the example of the Wilderness Act—empower people by making it easier for them to get the information they need.

7. Avoid the propensity of government to give you false action. Advisory committees are usually made up of one environmentalist, one grazer, three loggers, two miners and you know the rest. That's one way to do things, but it's better when everyone sits down to plot your strategy.

8. Trust decentralization. Beware of your own bureaucracy and your central office, because it kills personal involvement.

9. Organize and train. Share the skills you have. No fight is really worth winning if we've won it by ourselves without bringing more into the fold by spreading the knowledge and sharing the skills. Build coalitions, train for real political skills and empower people.

In brief, this is the story of how, for the last 100 years (and most particularly the last seven under Ronald Reagan) the conservation movement in the United States has reached right over the heads of politicians who could not see our vision and could not grasp the public cry for a clean and safe environment, for wilderness and wild places.

John Muir was not one for meetings or bureaucracy. We should act upon his advice when he said, "Let's sit down and do something that will make the mountains glad."

LESSONS IN CONSERVATION AND DEVELOPMENT—MOVING INTO THE 1990s

William K. Reilly

Two hundred years ago the Constitution of the United States was ratified and the Northwest Ordinance was enacted. The Ordinance provided for the mapping, marking, subdivision and settlement of the Northwest Territory, the frontier beyond the Appalachians that was to become the American Midwest.

This year a new constitution is being drafted in Brazil. This constitution may contain an article dealing with conservation. Whether Brazil's constitution will also attempt to chart a course for the future settlement of the world's richest biological wilderness remains to be seen.

A high drama is unfolding in Brazil. This vigorous and capable nation, a country of boundless resources and millions of idle hands, hungry mouths and "empty" land, a place full of promise and debt, is poised in a pivotal position between conservation and development. Will they save the Amazon? That is what we conservationists want Brazil to do. That is what we want Mexico and Indonesia, Zaire, and Madagascar and Nepal and Peru, and so many other poor nations of the biologically rich tropics to do: Save their forests and spare their habitat of countless species of wildlife. Convincing them to do it and helping them to do it in ways that further their national development and enrich their people are the premier challenges to conservation in our time.

The Conservation Foundation has been involved in the developing world, since its founding in the late 1940s. The Foundation began work on soil conservation projects, especially in Latin America, in the 1940s and 1950s. We have been active in park planning and wildlife conservation, beginning in Africa in the 1950s. We began almost 40 years ago at the foundation to assess the relationship between population growth, resource use, and living standards in the developing countries.

World Wildlife Fund has worked in developing countries since its start in 1961. Likewise the World Wildlife Fund has worked for 26 years helping our colleagues in Costa Rica develop their national park system. In the process, we have learned that preserving the parks depends as much on influencing the human activities taking place outside park boundaries as it does on managing wildlife and wild lands within.

World Wildlife Fund is one of 23 national organizations in the WWF family. With more than two million members worldwide, it has shaped, supported and managed programs around the world that put theory into practice. WWF-US has supported 1,100 field projects in 96 countries to preserve natural areas, study ecosystems, educate local people, strengthen local organizations and, most importantly, to provide alternatives to short-term plunder of natural resources.

Some current World Wildlife Fund projects might surprise you: We are financing a kerosene fuel business in the Annapurna Conservation Area in Nepal. We are supporting 26 tree nurseries in Costa Rica. We are helping fishermen increase their catch in Africa's Lake Malawi. We are supporting a new timber and Christmas tree industry in Michoacan, Mexico. We also are experimenting with new forestry techniques in Mexico. We are helping local people exploit the tourism potential of mountain gorillas in Rwanda, of parks in Colombia, and we are paying for cadastral surveys and land titling in Central America.

Each of these efforts has a long story. Each grows out of indigenous needs and responds to local wishes. None seems on first inspection to have very much to do with wildlife. But they do. They represent tenuous yet promising steps toward

coexistence, the survival together of plants and animals and people. I believe these projects point to the future of conservation in the developing world. And I believe they have some lessons for us today.

First, these projects depend very little on accepted theories of economic development. In fact, economic development theory has never had much to say about conservation of natural resources. Development economists have taken natural resources pretty much for granted and many large development projects have wrought havoc and destruction on a scale as large as the grand construction schemes themselves. They have been disappointing economically as well.

Now there is a welcome reassessment under way within the community of development economists. New environmental requirements are being imposed. New attention is given to the secondary effects of big dams, of road development schemes, of rangeland projects and cattle ranches.

This reassessment comes at a time when public interest from the United States in the wildlife and forests of the developing world is growing dramatically. World Wildlife Fund's membership has increased 50 percent to 320,000, during the past year alone. World Wildlife Fund is exclusively oriented to international conservation, and our membership growth is a measure of the U.S. public's increasing awareness of these issues. So, too, growing congressional interest and new federal laws affecting the conservation activities of development assistance agencies is a measure of changing public attitudes in this country.

The second lesson our projects underscore is the increasing significance of natural resources in the development of the Third World. World Wildlife Fund's efforts are aimed at saving forests and wildlife by finding a means for local people to improve their material well-being. To a very large extent the economies of developing countries depend on renewable natural resources, on agriculture, forestry and fisheries. This has been true for hundreds, even thousands, of years and in many of these places continuing harvests have not impeded natural productivity. Yet it is not clear that modern economic livelihoods can be sustained for large numbers of people in rain forests and savannas. That is the experiment under way.

As a joint undertaking of both World Wildlife Fund and The Conservation Foundation, we have recently established a major new enterprise, The Osborn Center for Economic Development. This center will inject us directly into the debate about economic development. The center draws on the natural scientists and field projects of World Wildlife Fund, and the social scientists and research skills of The Conservation Foundation. Its research, field projects, experiments and communications will, we intend, inject a powerful new voice for conservation into the economic development debate, as we bring a greater awareness of economic realities to conservation action.

The urgency of these efforts was brought home starkly to me during a visit to several of the magnificent national parks of Costa Rica. Costa Rica is justly regarded as the most successful of developing countries at creating parks, building a professional park service and enlisting widespread public support for

conservation. Yet around many of these parks, farmers without land are clearing forests to establish ownership claims. The forests are falling at a rate expected within 10 years to leave Costa Rica a net importer of timber, which historically has been a major export. The handwriting is plain to see. Many of Costa Rica's parks are not secure, as growing incidents of poaching, squatting and mining have demonstrated. In the simplest sense, World Wildlife Fund's long and substantial investments in 16 of Costa Rica's 22 national parks and reserves are not secure. There is little time to find economic solutions that will save the tropical forests of Costa Rica. In many other developing countries there is even less time.

A third lesson from our experience is the value of involving local people. In the search for conservation methods that work, we have learned to rely on the locals. Local people operating through indigenous organizations are involved in virtually all our activities. We are giving the highest priority to fostering indigenous leadership and building enduring institutions.

Last year World Wildlife Fund held a conference on conservation in Latin America to celebrate our 25th anniversary. The sophistication represented in the leaders of Latin American nongovernmental organizations was impressive. My reaction to them was to begin an assessment of the degree to which we can increase our support to them while cutting the strings on our assistance. Particularly in Latin America, where many private conservation groups now have 10 or more years experience, they are coming of age. They often need help with organizational issues such as fund raising, relating to Boards of Directors and managing contacts with a variety of constituencies. But they are also increasingly professional, stable and effective. They are finding their own voice and charting their own course. Our job is to help them find a conservation strategy suitable to their own culture, its politics and economics.

Working through indigenous organizations helps keep outsiders like us honest. It makes for a modesty in our operating style that is consistent with trying to influence the policies of countries other than our own.

We have learned something else about these groups: They are becoming critical agents of initiative and change, even in societies that don't permit or have a tradition favorable to much activism outside of government. In Brazil, even under the generals, scores of neighborhood groups were formed and tolerated to effect environmental improvements. Today they are flourishing. In Chile, environmental action at the neighborhood level and in the universities has provided experience in democratic organization to a cadre of potential future leaders. In Mexico, private organizations have entered into unprecedented partnerships with government to establish wildlife reserves, promote water conservation and change policies on hazardous waste management. The experience of these groups is valuable to their countries, even beyond what they achieve for the environment. They are pointing the way to greater democratization in the conduct of public life.

A fourth lesson from our experience speaks to wilderness. Wilderness, as Rod Nash has written, occupies a special place in the American mind. People in

this country in the 1980s have an idea of wilderness as being "forever wild," a place where humans enter as visitors, but neither stay nor leave any mark.

The American idea of wilderness is not easily exported to the developing world. There the challenge is to look for sustainable uses and compatible economic activities. An economic justification to create a park or reserve must often be found in the first place.

There is nothing surprising about this. A 1985 report of The Conservation Foundation, "National Parks for A New Generation," recounted the history of some U. S. parks. A good many of them owe their existence to local chambers of commerce whose members saw a national park as a means of bringing tourists and their dollars to remote mountain wilds. Railroads, realtors, public-relations experts and promoters of all sorts played central roles in winning park designation for early U.S. national parks. And so, too, economic arguments will matter when park proposals are advanced in the Third World countries.

A fifth lesson from our experience has to do with something we are not doing, but something I wish we were doing: rehabilitating degraded lands. There is an understandable tendency for international conservation groups to concentrate their energies on the very richest and most biologically diverse habitat. We do it. It is written into the criteria we at World Wildlife Fund apply when judging the suitability of a project proposal of a country where we might work: How important is the place biologically? How rich is it in terms of flora and fauna? How many of its species are endemic, that is, found nowhere else?

We will continue to apply these criteria, yet the march of deforestation and desertification have proved formidable in many countries. Degraded lands are expanding far faster than parks.

We conservationists are fond of final warnings. Our nightmares are of irremediable change. Truly, extinction is forever. The Amazon, once stripped of its forest cover, is mostly unproductive—of cattle and crops as well as of wildlife. Yet the day will arrive when we will become actively engaged in the search to return much of the deforested Amazon to productivity. The day has already come when we need to apply our energies to rehabilitating degraded lands. Virtually every country has an abundance of them. We cannot write these areas off because their trees and wildlife are gone. These vast, eroding, played-out wastelands can often be reclaimed. Huge tracts of clear-cut hill country in the Appalachians and Alleghenys were once the cause of heavy flooding and loss of life in Pittsburgh and other eastern U.S. cities. The federal government bought these lands for 50 cents an acre, beginning early in this century and continuing into the 1930s. The lands nobody wanted are now home to a rich variety of wildlife, and they contain a huge stock of hardwood timber. Benign management by the U.S. Forest Service of its acquired eastern forests brought them back. This is more difficult in many parts of the tropics but also more urgent. For conservationists, rehabilitation of degraded lands has not really been on the agenda. It needs to be there.

In the United States the Northwest Ordinance played an essential role in settling the continent. It unleashed the energies of countless people who moved

westward in search of opportunity. Yet, consistent with the spirit of the newly emerging United States, the surveys commissioned by this historic document imposed an egalitarian grid system on the landscape, laying the basis for land ownership and land-use patterns that are with us today. The survey lines cut indiscriminately across wetlands, watersheds and other natural features that we now know have important functions in keeping the land healthy and productive. After the Northwest Ordinance, environmentally sensitive lands opened to settlement. Settlers were encouraged to farm in places where the lack of rain all but assured failure. Native Americans were driven from lands they had inhabited for generations in some sort of harmony with the natural world. This, too, is the legacy of the Northwest Ordinance.

Imagine for a moment the difficulties and tensions that would arise today if, as a society, we were faced with establishing parameters for settling our frontier. Would our leaders draft a Northwest Ordinance in 1987 that respected what we know about the land and natural systems? Would they instead emphasize the economic opportunities or security aspects of settling the continent?

This is the dilemma currently faced by the people in developing countries rich in biological resources. We conservationists in the United States hope that as they settle the Amazon region and other frontiers they will take advantage of 200 years' experience in settling our continent not all to the good. A difficult battle lies ahead simply to provide in a useful and constructive way the benefits of our successes and our failures. We in the developed world are support troops who must above all keep the ammunition flowing to our friends on the front lines in the developing world. Sometimes I think the marvel of it all is that we are, from time to time, even winning some battles. But the outcome of the war is by no means certain. What is certain is that to win the war for conservation we must also win the war against poverty.

INTERNATIONAL PROGRAM INITIATIVES

Jay D. Hair

The scientific and conservation communities are only too aware of the serious global environmental problems that we humans have produced in the last few decades. Just consider some of the major environmental disasters of the

last three years.

Worldwide, an estimated 60 million people have died of diseases related to unsafe drinking water and malnutrition. Most of the victims were children.

In Africa, environmental neglect and misguided development created a crisis, triggered by a drought, that put 35 million people at risk. It may have killed as many as one million human beings.

In Bhopal, India, a pesticide leak killed more than 2,000 people and blinded or injured more than 200,000 others. In the USSR, the Chernobyl accident sent nuclear fallout across Europe, increasing the risk of future human cancers. In Europe, mercury-based agricultural chemicals and solvents accidently flowed into the Rhine River, killing millions of fish and threatening drinking water in West Germany and the Netherlands.

In the United States, acid rain alone is causing profound damage to natural resources, leaving thousands of lakes and streams devoid of any life, devastating forests and perhaps causing as many as 50,000 premature human deaths each year.

But perhaps the worst environmental assault mounted by humankind in recent years is the mass extinction of wild species. The global rate of species extinction is greater than any we have seen since the age of the dinosaurs. Although we can only tentatively predict the full global impact of these extinctions, we do know the impact will be profound.

While I have recited a familiar litany of environmental disasters, I do not intend to leave you with a bleak picture of a world descending into ruin, devoid of hope. There are solutions to our environmental problems. Humankind, after all, has the capacity to abandon old patterns of thought and action. We have the capacity to create new approaches, but only if we acknowledge some essential facts and act on them.

First, we must understand—really understand—that the earth is seamless. Environmental degradation recognizes no geopolitical boundaries. Extinction of a wild species indigenous to one hemisphere is really a loss affecting all of the earth's living resources.

Second, we must acknowledge that human health as well as the health of wild species are directly dependent on the health of our global environment. We must help the world's policymakers devise strategies that will enable countries to escape the various cycle of overpopulation, resources depletion, environmental degradation and human misery.

Third, we must recognize that environmental protection and economic development are not arch rivals. They are not mutually exclusive. Indeed, they are mutually dependent.

No nation, whether developing or developed, can hope to attain or sustain economic progress while sacrificing environmental quality. Instead, we must pursue economic development which respects both the environment as well as the cultures of native peoples. I believe the U.S. conservation community is determined to do just that around the world.

Certainly, the National Wildlife Federation is committed to these dual and compatible goals. Let me briefly outline our current international program initiatives.

In 1980, our Board of Directors authorized the formation of an International Wildlife Federation. Our international program was initiated in 1982 by Barbara Bramble, who still serves as the program director. The federation, through Barbara and her staff, has been working closely with the local non-governmental organizations to help Third World people maintain their cultures, their homes and their environments.

Indeed, we have been pressing the world's multilateral development banks to assess the environmental impacts of projects before they approve funding.

Our efforts and those of other conservation groups have begun to pay dividends. The World Bank has announced the formation of an environmental department. It is beginning to deny loans to projects whose by-products include environmental degradation. That is not the only innovation in the international financial picture.

The National Wildlife Federation participated in and endorsed a second, major step—the first implementation of the debt-for-nature concept—as government agreed to set aside nearly four million acres of rain forest in exchange for retirement of $650,000 of debt. Moreover, the federation fully supports Congressional legislation to encourage the World Bank to suspend loan payments for countries that protect tropical forests. Debt for nature swaps are golden opportunities to save critical wildlife habitats while paying off a portion of the Third World's $1 trillion debt. They are dramatic events on the global stage.

Yet, the federation's international environmental programs go far beyond the financial arena. Following are examples of how our educational and research efforts have touched citizens in every part of the world.

International Wildlife, spotlighting nature's wonders, is one of our four major publications. Published bimonthly since 1970, it appears as *Biosphere* in Canada, available in both English and French. For many, years we published it in Japanese. In 1972, it was the only non-governmental report officially distributed to the delegates at the United National Conference on Human Environment.

Our educational efforts have gone far beyond *International Wildlife* magazine. We are working with the government of India to adapt our 50-year-old National Wildlife Week campaign to its culture and needs. The federation is also working to adapt our premier teaching guide, *NatureScope,* for use by school teachers in India.

With funding from the U.S. Agency for International Development, the federation has mounted a traveling show called, "Our Threatened Heritage." The program illustrates how birds of prey represent the need for international conservation efforts.

The federation's Institute for Wildlife Research has been pivotal in our international conservation initiatives. Our Feline Research Center has been

active in research on ocelots and margays in the nation of Belize. With funding from the World Wildlife Fund, we have translated the Wildlife Society's *Wildlife Techniques Manual* into Spanish.

In the near future, we will sponsor the publication of (in English and Chinese), the proceedings of the First International Conference on Wildlife Conservation in China.

Four years ago, the federation brought together scores of researchers from around the world for a unique International Cat Symposium. Written proceedings from that symposium are now available in a single volume, perhaps the richest collection of ideas on the subject.

For many years, our Conservation Fellowships have offered research funds to students at schools across North America. This year, for the first time, a Chinese student will receive one of the fellowships.

We also supported travel of conservationists from other countries to participate in conferences and training sessions in the United States. We sponsored the travel of several delegates to this World Wilderness Congress. In the spring of 1988, we will sponsor four Chinese wildlife researchers for the training sessions at the International Crane Foundation in Baraboo, Wisconsin.

As you can see, the National Wildlife Federation's international efforts have not been limited to one focus nor even to the organizational confines of one office. Yet, as fruitful as our efforts and those of other organizations have been, the world's environmental problems, and especially those ofthe Third World, demand more attention.

In the face of overwhelming Third World poverty, traditional environmental solutions may simply not be enough. They may not be enough to designate a park or a biosphere as critical habitat. They may simply not be enough to declare another species as endangered.

Many of the Third World's environmental problems are caused by poverty itself, then exacerbated by misguided development proposals that ignore local cultures and native needs. New ideas and new approaches are desperately needed if conservationists hope to assist the Third World in recovering its economic stability without sacrificing its unique natural resources.

In 1981, Norman Myers, an outstanding British scientist who was completing 20 years of work in Africa, presented a thought-provoking idea. If wildlife is not economically self-sufficient, he wrote in *International Wildlife*, there is little point in saving its living space. If it pays its own way, some of it will survive. If it can't, it won't.

He went on in the article to call for the commercialization of wildlife in many parts of Africa. In certain key ecological areas, he called for total protection. Elsewhere, he said, "The sooner Africans can enjoy gazelle goulash and wildebeest casserole, and the sooner the trade in zebra skins is regulated and expanded, the sooner a more hopeful era will dawn for African animals."

Not only did Norman Myers advocate tourist lodges in African park ecosystems, he suggested canning factories to package meat from excess wild

game, a practice that was already going on in South Africa's Kruger Park. He advocated conservation planning that would accommodate, not exclude, human communities.

In 1981, Norman Myer's article caused a furor. Outrage was voiced far and wide. In the next issue of *International Wildlife* , the federation published two pages of letters to the editor.

Indeed, economic exploitation to conserve wildlife appears, on its face, to be a contradiction in philosophy. In fact, it is not.

A survey of international conservation leaders, conducted by *International Wildlife* just about two years ago, indicated the same belief: That wildlife and wilderness ecosystems must be given an economic value or we stand in danger of losing them to the poverty and hunger of the Third World.

Economic value can, of course, mean tourism, if the tourist dollars go into the pockets of natives who may lose their livelihoods in the wake of environmental protection. A story from Mexico will illustrate my point.

Eight years ago, a television reporter traveled 80 miles outside Mexico City to do a story on the winter hideaway of more than 100 million monarch butterflies. At the time, the area was a hotbed of logging and agriculture. But each winter, the fir trees became golden with the color of thousands of monarchs nestled in the branches.

The reporter came across a native ready to cut down one of these fir trees. She asked, "Why chop down this tree? Aren't the butterflies in danger?"

The native pointed to the village, where his family waited for the money he earned by logging, and said simply, "I do it for my children."

Last year the television reporter returned to the monarch's winter kingdom. This time, a roped-off walkway wound through the trees. Signposts along the way explained how the forest acts as a watershed. How it prevents soil erosion, protects scores of animals and plants and shelters the wintering monarchs.

The Mexican government had, of course, declared the area an ecological preserve. It had placed stringent restrictions on logging. This time, the same native who had met the television reporter years earlier was not a logger, but a tourist guide in the preserve.

Naturally, the reporter had to ask, "Why are you working here as a guide?" As he had the last time, the native pointed to the village where his family waited for his paycheck, and he answered, "I do it for my children."

Indeed, he was earning a living for his children. But in the process, he was also saving wildlife and habitat for generations yet to be born. His work on behalf of conservation was finally putting food on his family table and guaranteeing a future for wild species.

Few stories in the Third World end so happily. Indeed, the verdict is still out on the monarch butterfly's preserve area. Only with time will the Mexican government and the natives who depend on the area be able to tell if tourism will provide an adequate livelihood. But it is an experiment worth emulating around the world.

Conservation can best succeed if it pays its own way. That is not a theory of exploitation, but a fact of life. The sooner experienced wildlife scientists help developing countries devise profitable conservation plans, the sooner wildlife and the habitats on which it depends will be protected for the benefit of future generations.

The writer John Hersey, in his new book entitled *Blues*, writes of humankind's environmental abuses, "If these follies continue to go unchecked, they are liable to break forever—irreparably—the delicate laws of balance. If that happens, links of life on earth—the fragile chain—will part and will never be able to be mended. We'd better marvel while we can."

I'd like to amend that last line. I believe it should read: "We'd better mend while we can." For ours may well be the last generation given the opportunity to protect the final critical vestiges of environmental quality.

The National Wildlife Federation is planning to expand significantly its international program initiatives in response to the growing global need for conservation programs. Today and in the future, we look forward to working with you in building a world that lives at peace with itself and in harmony with its natural resources and environment.

GLOBAL CHALLENGES

Peter A.A. Berle

Virtually anywhere one might choose to look in the world—from the population crush in Mexico and Egypt to the deforestation of Indonesia and Central America—nations of strategic importance are suffering from environmental and population problems that have frightful potential to destabilize their governments and the regions in which they are located.

Those of us in the U.S. sustainable development around the world have a unique opportunity now and over the next few years. This is our "window of opportunity" to establish in the public mind and in U.S. policy the strong link between the environment and security.

The report of the World Commission on Environment and Development has given us a powerful tool—a tool that is most useful to us right now.

Environmental and conservation organizations in the United States—both large and small—have not only an opportunity, but a responsibility, to advance the cause of environmentally sustainable development. The enormous scope of the global conservation and population problems confronting us calls for a com-

prehensive approach, which from the standpoint of a nationwide grass roots organization like the National Audubon Society, has several major components.

1. Reevaluate "National Security." We, as citizens of the globe, must bring about a reevaluation of the concept of national security by all nations. Historically, national security has been closely related to the development of sufficient military strength to defend against aggression, or to protect national interests around the globe. This notion also has driven efforts to protect industries from foreign competition, or to encourage industrial establishment.

We must keep upper most in the minds of the public and our leadership that environmental protection and sound resource use is at least as important. This includes environmental protection within every nation-state and outside its borders as well. Internally, environmental protection ensures the public health, food supply and sound resource use, without which no nation can survive. Yet maintaining a sound environment at home is not sufficient to protect any nation-state. The events at Chernobyl just over a year ago and the contamination of the Rhine by a chemical fire in Switzerland remind us that an environmental disaster in one country can put a neighboring country at risk.

In effect, the national security of all of us depends to some degree on the effectiveness of environmental protection within neighboring states.

Furthermore, in a world economy, everyone depends on products from somewhere else. That supply can only be assured in the long run if the supplier follows sound environmental protection practices.

National security also is dependent on mutual and collective efforts among nation-states to protect the global environment. Depletion of the ozone layer, the greenhouse effect and resultant global warming, the spread of toxins in food chains which know no national boundaries: These are all phenomena that a great many nations are contributing to and, in varying degrees, each threatens the safety and the national security of us all.

The challenge for all of us is to persuade governments and policy makers that, by ignoring environmental protection and conservation, they put their own nations at risk.

2. Building a Domestic Constituency. Another important component of our strategy for meeting the global challenge involves public education and grass roots activism through which the U.S. conservation community should be working to build a strong constituency for supporting environmentally sustainable development as an integral part of U.S. policy. This has been and will continue to be hard work. But it can be done—both through vehicles of mass communication and on a local level. We at Audubon see public education as a key to the success of any popular campaign on behalf of sustainable growth. These educational efforts can take many other forms, such as classroom education and leadership training of local activists, to name two important ones. At Audubon we recently completed production on a 23-minute video production designed to build local support for population programs. This is not something we expect to see broadcast nationally. We are working with local Audubon

chapters in many states where this program will be shown in places like local activist meetings and on community access cable television channels. The success of this particular project, it should be emphasized, will depend on countless hours of work by our staff and volunteers to ensure that the message of this video gets out.

3. Reforming U.S. Policy. A third part of our strategy focuses on ensuring as much as possible that the concept of sustainable growth runs through every aspect of U.S. foreign assistance, both directly through U.S. assistance programs and indirectly through international organizations that the United States helps to fund. This means we must work toward a comprehensive redefinition of both U.S. foreign assistance and foreign policy objectives. This will be no small task. But we have nothing to lose by aiming high. The place to start is with the environmental and population programs of the U.S. Foreign Assistance Act. We need to tell skeptical policymakers that these programs need major strengthening and that environmental destruction in the Third World poses extraordinary threats to international stability. Both elected and appointed government officials in Washington must hear again and again that a U.S. foreign policy which encourages sustainable development will, in the long run, do more to promote stability and security than our current overriding emphasis on weapons programs and military strategies.

Equally important, however, is that we must focus on the "sustainable" part of our message. We must be sure to make the point that all our efforts—from family planning to forest conservation—will be truly effective among Third World peoples only if we tie these programs to the believable promise of a better life. That is the uplifting vision we must offer.

4. Practicing What We Preach. The fourth and final component of our campaign to encourage environmentally sustainable growth is based on the belief that we must practice what we preach. As watchdogs over U.S. policies, U.S. environmental organizations must work to ensure that the United States is not asking the people of Mexico City or Lagos or Calcutta to do something that people in New York or St. Louis or Denver won't do. Let us note, for example, that in some areas of the United States, groundwater which cannot be replenished is nonetheless being "mined" both for agricultural and municipal uses.

We also should note that the United States in some ways encourages developing nations to diminish their natural resources. Throughout the Third World, toxic chemical contamination threatens water quality. This is largely because industrial nations have left vast loopholes in their laws which permit banned or restricted products and processes to be exported to developing nations. These nations usually lack the regulatory mechanisms necessary to protect themselves.

In some parts of the United States, our government pursues a so-called "forest management" policy for national forests which encourages harvesting of old growth forests at an unprecedented rate. We are changing the face of the forest for hundreds of years before we fully understand the biological value of these ancient forests. Practiced elsewhere, we call this deforestation, while here we

call it "management." We also must note that in other areas of the United States—some not very far from where we sit today—hundreds of thousands of acres of fragile land are being overgrazed as a result of crazy-quilt government policies that actually subsidize this environmental destruction.

In the American west there is a river called the South Platte. By the time its waters join in Nebraska with the North Platte, they form a place of worldwide environmental significance. The story of the Platte, I believe, epitomizes America's wasteful use of natural resources. Each spring in March and April, a half-million sandhill cranes—80 percent of the world's population of this species—gather on the Platte as a staging area for their northward migration to the Arctic and Siberia. During their stay of several weeks on the Platte, the birds gain critical food reserves. We cannot overemphasize the importance of the Platte as nature's fueling station for these cranes. To help understand this, paint a picture in your mind of an hourglass superimposed on a map of North America. The wide segments are to the south around the Gulf Coast, Texas and Mexico, and to the north in the Canadian Arctic and parts of Siberia. In between those wintering and summering grounds is the narrowest part of that hourglass—along a small section of the Platte in central Nebraska. At times each spring, it is possible to view tens of thousands of cranes on and around the Platte. This makes for one of nature's true wonders of the world.

Yet the Platte is a river under siege. A series of dams and reservoirs now diverts surface water and groundwater for irrigation, electricity and municipal water supplies. A total of 70 percent of the river's historic flow is gone. But this is not the most significant threat to the river and its wildlife. The river is under siege because of a single-purpose push for total development of its water resources. The most immediate threat comes from Denver, with a project called Two Forks Dam being pushed by the Denver Water Board. If this Denver water project, with all the environmental havoc it will wreak, were being sponsored by the World Bank in a developing nation, there would be a hue and cry from people both in the United States and elsewhere about wasteful environmental destruction sponsored by foreign assistance. But we all know that this kind of environmental waste—and destruction—is much too common in the United States. That is why, in our enthusiasm for sustainable growth policies, we must not forget that promoting sustainable growth starts at home.

Looking to the future, let me reiterate that conservation and environmental organizations—whether they are local, regional or national in scope—have a particular responsibility. We must raise public awareness of the principle that the human race is the steward of the earth's environmental health and vitality. As a start, we must work to make the public and our leaders understand that for the first time in history, we face a situation in which unprecedented numbers of people are using and misusing their natural heritage in ways that cannot be sustained. The solution to this enormous challenge is found in a myriad of policies that will slowly turn this situation around to one of sustainable growth.

BEYOND OUR BORDERS

Michael Fischer and Michael McCloskey

While the Sierra Club is best known for its work on U.S. environmental issues and campaigns, we have had an active international program since 1971. Sierra Club participated in many of the international conferences that have been held over the last 15 years where vital environmental issues were debated. We were active in the development of the United Nations' Charter for Nature. We worked actively in developing the environmental components of the Law of the Sea Treaty, though unfortunately, the United States has not chosen to ratify this critical agreement. We were active in the process of developing the Camilar Treaty, dealing with the Antarctic and Southern oceans. We worked under a United Nations Environment Program grant with the government of Venezuela to survey its forests, and that survey helped them to set aside some 22 new national parks in the mid-1970s. Not too long ago we undertook a study of Mangrove forests in the Caribbean.

However, in 1985 we chose to change the focus of our programs somewhat, when we moved from being close to the United Nations in New York to Washington, D.C. We now have two thrusts to our program. The first draws upon our active membership base in the United States to influence the U.S. government to be as environmentally responsive as possible. We put special emphasis on lobbying the U.S. Congress to, in turn, induce the executive branch to improve its performance.

The second thrust of our program involves reaching out to like-minded environmental groups around the world, particularly in developing countries, to encourage them to proceed with their efforts to press for environmental reforms in their own countries and develop the political will to act.

Given these two aspects to our program, we are now focusing strong efforts, with a coalition of groups in Washington, D.C. and in other countries, on reforming the lending practices of the multilateral development banks, particularly the World Bank. We're working closely with the U.S. Treasury Department as they try to induce the World Bank to adopt the 19-point program which the U.S. Congress has asked the bank to pursue. We published a major brochure, entitled *Bankrolling Disasters,* on the problems posed by the insensitive practices of the lending institutions. It has been widely distributed throughout the world and is designed to develop the constituency for that reform and to document the need for those changes.

Among the critical changes for which we and this coalition are pressing is the enlargement of the environmentally trained staff of World Bank. The president, Barber Conable, has recently promised to do that, although a controversy rages over the degree to which that will actually happen. We are trying to

get World Bank to actually follow through and implement its many policies which sound good, but which in practice are often ignored. We also want the World Bank to avoid projects that would encroach on wilderness, to enforce its policies for the protection of wilderness and to withhold funding if its policies are violated as a project proceeds. The U.S. executive director of the bank has begun to vote no on bad projects. We welcome Treasury Secretary Baker's leadership in this regard, particularly his efforts to press for even better bank policies on such matters as grasslands, and his ideas concerning debt relief projects that would provide new advances for conservation in return.

We're working to persuade other countries to also vote no, when appropriate, at the World Bank. This past year a number of projects have been suspended as a result of such votes, so progress is being made. We are reaching out to NGOs in other countries to get them to persuade their governments to join this effort. When the World Bank meets in Washington, D.C. in a few weeks, we, as part of that coalition, will be working to get the bank to take the coalition's concerns more seriously. For the first time NGOs are being admitted as observers at World Bank meetings.

We're also working to persuade the regional development banks to follow suit. We brought 15 Latin American NGOs into the May 1987 meetings of the Inter-American Development Bank to observe the proceedings. We were among those encouraging the IADB to bring in the environmental ministers from the participating countries to create a dialogue with the finance ministers. It is vitally important that the ministers involved with finance and development hear that the concerns which the NGOs have voiced are also shared by these government officials from the environmental ministries in their own countries. They are discovering that it is not just the NGOs from developed countries that are voicing criticism.

In June 1987, we were invited to make a presentation to the African Development Bank in Cairo on how it might give greater regard to the environment in its work. We have now been invited to advise them in setting up a meeting similar to that held by the Inter-American Development Bank.

Finally, we have been working to encourage the U.S. development assistance agency, AID, to move more aggressively in the environmental field. We worked with others to get the U.S. Congress to pass two landmark pieces of legislation in 1986 to direct AID to do more to protect tropical forests and promote biological diversity, and to spend greater sums toward those ends. We are working this year to increase the funds for that purpose. The legislation passed in 1986 also bars any U.S. funding for projects that would invade or significantly degrade protected areas such as wilderness areas and national parks. We are working now for legislation that would increase the funding for financial assistance in Africa and earmark specific sums for both environmental and population work on that continent. I should add that in the past we have worked very hard with others to sustain and increase the levels of funding for the United Nations Environment Programme.

Not only is our staff active, but our volunteers are active too. As is very much the pattern in the Sierra Club, we have volunteers who are working as part of the IUCN and who work with the World Wilderness Congress. We also have a volunteer who is working with environmentalists in Puerto Rico, building a cadre of citizen conservationists.

We feel it very important to enhance communication with environmentalists in other countries, which we do through our Earth Care Network. This is an informal network of like-minded groups who want to extend themselves to help each other whenever they are mounting major campaigns in their own countries. There are no dues or obligations of membership, but the network does operate in the spirit that we can all help each other in our moments of need. The Sierra Club donates its services as the secretariat. We spread the word when groups want world attention to their campaigns, when they want to show their governmental officials that the interest is not just local but widespread. We will attempt, with others, to generate publicity abroad on those issues and to spread word about international campaigns such as the efforts to reform the World Bank. We also try to encourage exchange between environmental groups and our chapters in this country with environmental groups abroad, so-called sister city-type relationships.

Finally, the World Wilderness Inventory has been a new, specific project which we developed especially on the request of the World Wilderness Congress. This pioneering project will continue to grow and expand in the years ahead. A great deal needs to be done in the years ahead, and we look forward to working with other groups to make conservation the priority item on the world's agenda for sustainable development.

PROTECTING LAND AND BIOLOGICAL DIVERSITY FOR THE FUTURE

Frank D. Boren

The threat to wilderness and the global environment is well documented, therefore I will not make mention of them. The flora and fauna of our planet are increasingly endangered and the Nature Conservancy is committed to respond to this critical issue. In doing so, we will make its resources available to work

cooperatively with other groups that share our mission to preserve the earth's threatened natural heritage.

It is the Nature Conservancy's mission to preserve biological diversity. We do it domestically as well as beyond the borders of the United States. Domestically, through state natural-area inventory programs now operating in nearly 50 states, the conservancy identifies those areas and habitats that must be protected. We then move quickly to protect those sites, most often by purchasing them. Once the land is acquired, we bring in our stewardship program, which monitors the land to make sure the reasons for setting it aside are not lost through lack of tender loving care. We currently own and maintain over 1,000 preserves, the largest private preserve system in the world. We also assist government agencies in this country to do likewise.

We have been in the international conservation business for nearly a decade. It's a tough business. With other groups, we have set up seven Conservation Data Centers in Latin America, modeled after our domestic heritage programs. Although the diversity of habitats is much greater in Latin American countries, the data is becoming available to decision makers in these seven countries to enable them to determine preservation priorities.

The second part of the program is to support other nonprofit conservation organizations, initially in Latin America and later, elsewhere. They need to be self-sufficient in order to help influence their governments and citizens of the importance of setting aside preserves for natural diversity. With other conservation organizations, we are now working with non-governmental organizations in Costa Rica, Panama, Venezuela, Columbia, Ecuador, Peru, Paraguay and Brazil (just starting), and the Netherlands Antilles. We are beginning programs in the Caribbean and we are again active in Puerto Rico.

We train people here and abroad in how to run the data centers with basic Nature Conservancy software. This software is not proprietary, nor do we want it to be. We also train people in stewardship, the care of the land set aside for preservation and in how to raise operational funds.

We are trying to stay with what we already do well and can pass on: namely stewardship, scientific and protection expertise. We are not economic consultants. But we realize that the world needs sustainable growth and we welcome as partners in our mission those organizations that have the capacity to foster that sustainable growth through economic analysis and other means.

We are also not in the grant-making business. We will help an NGO get up and running, but then we will strive to make it self-sufficient. We have found in our limited experience that we do not gain the respect of our partners by simply passing out money. Our partners abroad are equals.

The conservancy offers many resources and assets for conservation projects:

1. *A businesslike approach to conservation*—The Nature Conservancy has been in existence for 36 years and it prides itself on achieving results. In the United States we are now saving 1,000 acres a day, every day. We want to help achieve similar records internationally.

2. *People*—The Conservancy now has 46 active chapters with more than 1,000 dedicated volunteer trustees leading them. These trustees and our members are good, intelligent, caring Americans who are knowledgeable and concerned about the international environmental situation. They understand the threat and they are willing to fight it with financial support.

3. *Financial resources*—The Conservancy is undercapitalized for its mission but compared with some other nonprofit organizations we're doing well. In the United States we can mobilize up to $60 million for a preservation project at any time. We are willing to use our resources for international conservation. But it has taken us 36 years to build our financial base; we will not jeopardize it by acting imprudently.

4. *A science-based program*—We believe good, objective data is critical in the international arena. But to ensure we're on the right track, we're having our science program reviewed by some of the most eminent people in the field. If it is confirmed that our software for data collecting and dissemination is as good as there exists in the world, we will accelerate our efforts to make it available to Latin America.

We feel that the loss of diversity on the planet is a threat to mankind. We consider it to be like a war. We feel that when the people on this earth regard the extinction of species as a threat equal to the threat of World War II or Adolf Hitler, we will then realize collectively that we don't have enough time to determine who is the leader of the allies. We'll realize that we must act together with anybody who brings competence and skill to attack the problem.

The Nature Conservancy does not have all the answers. We consider ourselves more in the trade-school production business than the think-tank business. We pride ourselves in our execution and delivery on the ground.

We look forward to working in a collective effort to make something happen.

CONSERVATION AND NATIONAL PARKS

Paul Pritchard

In our world, three distinct philosophical approaches to man's relationship with wildlife and wilderness have evolved. First, there are those who believe that man is the dominant animal, the controlling variable, the ultimate predator.

Second are those who believe that man is but a player in a broader system. And third, there are those who follow the Gaia philosophy—that man is a part of this organism called Earth.

Three different angles. Yet each must inevitably lead to the same conclusion. Man the dominant must assume the responsibility of his role as steward or threaten his own survival. Man the player must realize that, as in the game of chess, each piece, king and pawn, is necessary to play the game. Man the earthling must assure the health of the whole organism, Earth, in order to secure his own place on it.

I think we can all agree that mankind's existence is only as rich and diverse as the richness and diversity of a healthy planet. In light of recent world economic development and demographic trends, the next 10 years are being looked upon as the ultimate opportunity for U.S. conservation organizations to assess mankind's impact on his environment and shape a positive plan for a sustainable future.

AN AMERICAN DREAM

In 1916, the U. S. Congress established the National Park Service to regulate the use of federal parklands, "to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations."

The U.S. National Park System is held in high regard by park professionals and citizen conservationists throughout the world. Since the establishment of Yellowstone National Park as the world's first national park in 1872, U.S. national parks and their administrations have been and continue to be the stimuli for similar conservation efforts by other nations.

But, sadly, public funds and political wills do not always stretch far enough to provide the care and protection that our 340 national park units need. To give an independent voice to the national parks, Stephen Mather, the first director of the U.S. National Park Service, took measures that led to the founding of the National Parks and Conservation Association (NPCA) in 1919. Since that time, NPCA has been the only national, nonprofit, membership organization in the United States whose mission is to protect and improve the quality of our personal commitment to national parklands on the part of the American people. We continue today as a constructive critic of and advocate for the national park system.

SHIFTING TO A GLOBAL PERSPECTIVE

While the National Parks and Conservation Association's focus is the U.S. National Park System, it has recognized in recent years a need for participation in the international park movement. As an expert on our national parks, NPCA has supported and advised other countries as they develop their own park systems. The primary thrust of NPCA's efforts is to assist in the establishment

of non-governmental organizations similar to NPCA to develop and protect parks in their respective countries.

NPCA provides support for the preservation of significant international resources through its participation in world park conferences, authorship of international parks' publications and sponsorship of specific international conservation issues.

NPCA's most recent involvement on the international level included participating in the Bali World Parks Congress in Indonesia and hosting a working conference on new directions for parks and equivalent preserves held in the Federal Republic of Germany in 1983, as well as cosponsorsing a voluntary-organizations workshop on the occasion of Canada's National Parks Centennial held in Banff in 1985.

In recognition of its efforts to advance the cause of parkland conservation in the United States and other nations, NPCA was the first recipient of the Albert Schweitzer Prize in 1986.

At the request of concerned citizens of British Columbia, NPCA spearheaded efforts to establish the International Coalition to Save South Moresby, which led to the establishment of the South Moresby National Park Reserve in British Columbia's Queen Charlotte Islands.

THE NEED FOR NGOS

In light of the emerging international conservation movement and the growing existence of important cooperative ties between NGOs and national park agencies, there is both a need and an opportunity to assist local and national initiatives with appropriate international cooperative assistance.

Just as the time is ripe for adding to the world's network of protected areas, so is it time to aid conservation consciousness among citizens and local officials in these nations confronted with threats to existing parklands. NGO groups are in the best position to enlist public support for this purpose as well as to give an independent voice for park-management problems caused by budgetary and personnel constraints, encroachments, pollution and other issues.

A FORUM FOR ACTION

NPCA, with the Canadian Parks and Wilderness Society and the National Parks and Environment Foundation of Panama, has initiated an International Parks Forum of the Americas and the Caribbean. We were pleased to launch this new effort in Pan-American environmental cooperation in conjunction with the 4th World Wilderness Congress.

The forum seeks to promote the exchange of information and technical expertise between participating NGOs and individuals; communication and action on common problems, transnational park issues and issues of broad international concern; and the strengthening of voluntary heritage organizations established to promote and protect national parks and protected areas.

Fifty-three participants from 17 countries attended the forum's first session,

which was organized by NPCA and chaired by Dr. Felix Nunez, President of the National Parks and Environment Foundation of Panama.

CARRYING ON THE DREAM

Park lands and park resources are only secure when they are understood, appreciated and personally committed to by local officials and institutions. The important and legitimate role that U.S. NGOs can play in assisting the conservation affairs of developed and developing nations should not be underestimated. The National Parks and Conservation Association will continue its involvement in advancing the world parks and protected areas movement. Whether predator, player or earthling, mankind has the opportunity now to decide his role on our spaceship Earth.

CONSERVATION BEGINS AT HOME

George T. Frampton, Jr.

It's interesting to recall that the reports brought back in the late 1860s by the first white explorers in Yellowstone of bubbling geyser pools and jagged peaks, waterfalls, bison and grizzly bears thick across the plain, were widely dismissed in the East as lies and fabrications. It only took a few years for Congress to be sufficiently convinced to set aside two million acres of the Yellowstone Region as our first national park.

In the ensuing decades, many of the crown jewels of our natural landscape were included in the park system. When you consider that our forefathers in this country viewed wilderness primarily as something to be conquered, tamed, colonized and above all, used, the creation of our National Parks System was really an act of extraordinary foresight. The same foresight was present when a group of conservation professionals concerned about the loss of wild lands in this country, largely outside the parks system and in our national forests, banded together in 1935 to found the Wilderness Society. It took Bob Marshall, Aldo Leopold, Aldous Murray and Benton McHigh (who invented the idea of the Appalachian Trail) nearly 30 years to persuade Congress to enact into legislation the National Wilderness Preservation System.

In the years since the Wilderness Act of 1964 we have succeeded beyond their wildest dreams, including almost 90 million acres in the wilderness system of this country. It is because of these acts of foresight that my generation of Americans has inherited a unique legacy. A small but significant percentage of the original wild nature of this country, millions of years of nature's evolving hand substantially untouched by human development, was passed on to us by our forefathers in trust and as William Mott states, to be passed on by us to our children and grandchildren, unimpaired for the enjoyment of future generations. It is going to take at least that kind of foresight to protect what we have received in trust and to live up to the trust that's been placed in us.

The American experience with Yellowstone Park illustrates two principal threats or problems through which this foresight can be experienced:

Population—We are truly in danger of loving some of our most important parks to death. It is interesting that, in 1872 when Congress created Yellowstone, the only real opposition came from people who said that it was unnecessary to make it a park because the area was too remote and nobody would ever go there. This summer, well over 1 million people visited Yellowstone, resulting in many cars, plastic cups, plastic bags and, in some cases, too many campsites in prime habitat areas. Excessive concessions, airplane flights, helicopter flights and all of those things not only stand to ruin a visitor's experience today, but to ruin the park tomorrow. We are going to have to learn how to manage the use of our parks and wilderness. We were the pioneers in this country in setting aside and designating this legacy for future generations, and if we expect other countries to manage what they have, we are going to have to take the lead in managing our own resources.

Development of adjacent lands—We have in the last 10 or 15 years begun to realize that our parks and wilderness areas are not islands. Yellowstone is more than the sum of its parts. Yellowstone National Park and Grand Teton National Park are far less than 50 percent of the region. These parks are surrounded by national forests, two wildlife refuges and a great deal of state and private land. The U.S. Forest Service has permitted clear-cutting up to the boundary of the park. If you look at a map of the Yellowstone region, with the national forest areas colored which have already been leased for oil and gas development, you'll see that between 70 percent and 80 percent of the region around both parks has already been leased. Only $18 per-barrel oil is saving us from substantial development threats to the parks. In this country we must begin to figure out how the different agencies of the federal government can begin to plan to protect our parks and wilderness areas.

If we're not able to ensure that the agencies of our own federal government can protect park wilderness, do ecosystem planning and begin to plan for buffer zones that are necessary to protect our existing parks and wildernesses, how can we ask other countries to do it? It seems as if we are unable to understand and then implement the Biosphere Concept in Yellowstone, Glacier, Everglades, Southern Appalachian Highlands, the California Desert and the big natural areas

in this country which have national parks at their core but are surrounded by federal land managed by other federal agencies. Therefore, when we do analyses of the national park in Honduras to demonstrate that the park is an integral natural resource for that country because of the water supply that it provides for the capitol, how can we expect the government of Honduras to take seriously our representations to it about this concept?

Yellowstone Park also provides a significant opportunity to make progress in restoring natural areas. Most environmental groups in this country are accused of just being *against* things. I think it's very important that private and non-governmental organizations in the United States demonstrate that we can be affirmative. We need not only to be in a position of simply stopping the destruction of wild lands, wildlife and other natural resources, but to have a program for expanding this resource. Yellowstone gives us an opportunity to do that.

The Greater Yellowstone Ecosystem has been substantially fragmented in some places by roads, clear-cutting and other types of development. These are areas that can be restored. The opportunity exists in Yellowstone to reconnect the park and two or three large wilderness areas that have been separated over the last 30 or 40 years. The areas through which development has occurred may never become wilderness again, at least in the strict context of U.S. law in the Wilderness Act of 1964. However, by closing roads, zoning and planning to limit certain kinds of development, thereby allowing those areas to restore themselves, it is possible in Yellowstone to create what we've begun to call at the Wilderness Society, "Phoenix Areas." This would not only be a resource area, but by the year 2000 a much larger natural area would exist than we have now, creating new wildlife corridors and a larger reservoir for biodiversity.

This is going to take land-use planning among federal agencies in the Yellowstone region and elsewhere. This is going to take the kind of land-use planning that we are urging upon other countries. If we can't do it, we're in no position to ask others to do it.

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THE IMPORTANCE OF RESOURCE MANAGEMENT

George M. Leonard

In the United States, we've had an abundance of resources to work with. We've used them—not always well—and, hindsight being better, not always wisely. There was a time when, as a nation, we faced a new land and the continent laid out before us was wilderness—3.6 million square miles, plus or minus a few. And out of those miles of wilderness we've drawn our resources and carved our nation.

We settled the land, broke sod, and plowed and planted the soil. We cut timber from our forests, mined minerals from our mountains, grazed cattle and sheep over our rangelands, and took game from our forests and fish from our rivers and lakes. We've used the land and its resources to meet our needs and build our nation.

We made mistakes along the way. We sometimes plowed where we ought not have, sprayed when we shouldn't have, and sometimes we grazed more livestock on the land than we should have. We overcut some of our forests, drained some of our wetlands, and polluted our air and water. We turned some of our best farmland into subdivisions, and pushed some of our wildlife species into extinction.

We eroded some of our soils. It was little more than 50 years ago that "black blizzards" of dust were lifting topsoil from the plains of Colorado and carrying it across the continent and out over the Atlantic Ocean. We have made mistakes with our resources and suffered the consequences.

But we learned from our mistakes and stepped in to correct them. We learned conservation tillage and other soil-saving methods, planted shelter belts and established conservation reserves. We learned forest regulation from Germany, and applied sustained yield forestry. We applied safer methods of pest management, protected endangered wildlife and fish species, and developed a Smokey the Bear fire prevention program.

We built federal and state conservation programs and established national forests, national parks, and national wildlife refuges. We preserved some areas as wilderness and set aside others for science. We've protected, preserved, reserved, restored, and maintained our resources.

One of the things we've learned is that, with good management, the land and its resources can recover. In the southern part of the United States, where 156 million acres of forest had been overcut by the 1920s, the forests have been restored to productivity. On many of those lands we are now planting the south's fourth forest. In the east, lands that had been overcut and abandoned—that

nobody wanted—under federal management have become shining gemstones of multiple-use management. Streams that once ran dirty now run cleaner. Good habitat management has begun to move Kirtland's warbler, the bald eagle and peregrine falcon, the Lahontan cutthroat trout, and other species back from the brink of extinction. And on the Great Plains, the soils of the "dust bowl" have been restored to productivity.

In the United States, we have had the advantage of an abundance of resources to work with, and this has shaped our progress. Our people have basic needs—food to eat, homes and jobs—and we have used and managed our natural resources to meet those needs and build a strong and robust economy. The strength of that economy has caused demands on our resources to continually grow and multiply, and to embrace new needs and wants such as recreation, spiritual growth, wilderness, and a clean, healthy environment.

Our history in the United States has been one of continuing expanding cycles of resource exploration, development, and use, interspersed with progressive cycles of conservation, scientific resource management, and environmental protection. Each of these cycles has presented us with a more complex mix of wants and needs to meet, and more sophisticated means of managing our resources to meet them.

As I've traveled in North America and abroad, in Europe and Asia, I've thought about how our experience with resource management in the United States compares with the experiences of other nations. One of the factors which has made our experience so different has been the sheer extent and variety—capacity—of our natural resources.

We have 2.3 billion acres of land and 107 million acres of water. We have 737 million acres of forest, 820 million acres of rangelands, and 421 million acres of croplands. We have 70 million acres of wetlands. These lands embrace resource conditions ranging from "used up" to untouched. They provide habitat for about 200 species of amphibians, 900 bird species, 1,100 fish species, 400 species of mammal, 350 species of reptile, and countless invertebrate species. They involve environments ranging from polar to tropical, and support an equally broad range of plant life. They contain large quantities of coal, oil, natural gas, and minerals. The commercial forest lands are among the most productive in the world.

This wealth of resources has permitted us to grow as a nation despite mistakes made with our resources which might have ruined nations less richly endowed. Of course, we are still struggling to find an acceptable balance among commodity uses and amenity uses for these lands, and I expect this struggle will continue. In effect, this struggle represents the continuing evolution of our economic and social systems.

There has been some question about the utility of the U.S. experience to other nations which have not shared it, especially to those seeking to become established and to develop their resources.

Our experience encompasses a great deal—what we've done well in managing our resources, and things we've done wrong. The sum offers several basic

lessons which may apply elsewhere:

—One basic lesson is that it is appropriate for a nation to use its resources to meet its peoples' needs. We were in a new land once. We explored and settled the wilderness, and we used our resources to build our cities, feed our families and keep our factories running. It is a basic responsibility of any nation to meet its peoples' needs.

—A second lesson is that it's necessary for a nation to manage its resources to sustain its peoples' needs from one generation to the next. We have learned at least part of this lesson the hard way.

We cleared the land and neglected our forests. We saw the consequences of overcutting and wildfire, saw the milltowns close, and heard predictions of timber famines. We plowed the land and neglected our soils and erosion turned the Great Plains into a dust bowl. We saw farmland lost, farms abandoned and the cars of the displaced people on the road to California.

But we found that sound, scientific resource management can protect and sustain the forests, that it can stabilize and rebuild the soils. And we found that scientific resource management can expand resource capacities, increase per-acre yields and improve resource utilization. We put policies in place and practices to work to sustain our resource needs. It is a basic responsibility of any nation to protect and manage its resources in a socially responsible manner.

—A third lesson is that a nation's needs change, and it is necessary for the focus and purpose of resource management to change as well.

When we were a new nation with the wilderness before us, we were two million Americans with a toehold on the continent. We needed to multiply and develop the land, and we did. We tapped the wilderness for its resources, passed a billion acres of public land into private ownership, and plowed the hillsides to plant our crops.

Now we are settled. There are 240 million of us spanning the continent and then some. We have a robust economy, a surplus of several agricultural crops and products, and we import and export more than any nation.

Our needs have changed and multiplied—evolved—and so, too, has the focus of our resource management programs.

We are setting aside wilderness—over 89 million acres in the total system so far, with more to come, to ensure the survival of our natural heritage. In the past 40 years we have tripled the area of federal land devoted to national parks. We have broadened management of the national forests to address a wider variety of uses and values—for recreation, wildlife habitat, aesthetic values, biological diversity and other purposes in addition to timber production, mining and grazing. And through the Conservation Reserve, we are paying thousands of farmers to convert millions of acres from agricultural crops to trees or grass.

In developing our resources, the United States has also developed a great deal of scientific and technical expertise in resource management. We are leaders in multiple-use land management, tree genetics and improvement, fire management, watershed science and management, and the biological control of pests.

Within the structures of the United Nations, the U.S. Agency for International Development, the Peace Corps, and other cooperative and exchange programs available, we're proud to share what we know with others. We share our expertise so that other nations, operating within their own unique social and political systems, can meet the needs of their people for food and shelter while protecting the land's productivity for future generations.

But it should be pointed out that the United States also benefits from such programs. We have always borrowed a great deal from the professional expertise of other nations. Bernhard Fernow, our first trained forester in the United States, came from Germany. And Gifford Pinchot, who put forest conservation high on our nation's agenda in the early 1900s, was a forester trained in France and Germany.

We've borrowed genetic resources from other nations, as well—Scots pine, Norway spruce, and eucalyptus among them. And we look to other nations for other expertise—to Sweden and Norway for their timber harvesting and utilization technologies, to Germany for its experience with atmospheric deposition, to Venezuela and other nations for what they've done with urban forests, and to Japan for expertise in cultivating one of our more recent products of the forest, Shiitake mushrooms.

Yet I believe that one of the greatest benefits of international cooperation is to our own people—to the people we send abroad, the technical experts who work with other nations. They return to us with a renewed realization of the ultimate connection between a nation's resources and its people.

We live in a world increasingly pulled together by our resources or lack of them. And we need to understand much. We have shared resource problems and solutions. Acid rain, the protection of whales and migratory birds, population pressures and the effects of deforestation on the global climate are only part of the spectrum of natural resource subjects that increasingly bring together people of the world. And, as a result, I see the nations of the world working more closely together.

As the pressures rise and the problems emerge to bear more heavily on our resources, we need to expand international cooperation. I envision more exchanges of scientific and professional personnel among nations—exchanges of students or faculty between universities, and of research scientists and technical experts between institutions of science and management.

I envision a recognition by nations of their joint responsibility, in the larger world, to share resources and expertise in managing and protecting them, as well as other information. If we shirk such responsibility, then the abundant resources of many of our nations may make them rich oases in a world of need.

Developed nations with abundant resources must somehow resist the strong temptation to ignore the rest of the world's resource problems. For those are the nations with the strength, wealth, technology, and institutional skills needed to reduce the loss of the world's resources and to help ensure their continued sufficiency.

The first obvious step in this effort is to set the example of wise planning and proper stewardship of our own resources. But a necessary second step is to view scientific knowledge and technology as basic global resources and to share them as we are able, with other nations.

In the words of a former U.S. statesman at the United Nations, the late Adlai Stevenson:

"We travel together, passengers on a little spaceship, dependent on its vulnerable resources of air and soil; all committed for our safety to its security and peace; preserved from annihilation by the care, the work, and the love we give our fragile craft."

THE AMERICAN NATIONAL PARK SYSTEM —NEW CHALLENGES

William Penn Mott, Jr.

In 1870 a small party of campfire philosophers elected to seek preservation of Yellowstone's wonders for public use rather than for private development. In doing so, they sparked a world concept of national parks. They also recognized that some natural treasures deserve protection for the benefit of all rather than development for the enrichment of a few.

As is the case with many historical leaders of new concepts, these campfire philosophers likely had no idea their approach would extend into the future and become worldwide. Since that decision to seek public use, there has been a steady course toward preservation of special areas and unique resources for the use of all.

Two years after the Yellowstone decision, in March 1872, the Congress of the United States designated Yellowstone as a public pleasuring ground. In 1916 Congress established the National Parks Service with a mandate to "conserve the scenery and the natural and historic objects, and the wildlife therein, to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

Then, in 1964, Congress enacted the Wilderness Act, specifying that designated areas "shall be administered for the use and enjoyment of the

American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness. . . ." And, further, wilderness was defined as "an area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions. . . ." Along the way there was enacted the Antiquities Act of 1906, the National Environment Policy Act, the Clean Air Act and the Endangered Species Act.

My premise today is that preservation of wilderness, natural areas, back country, wild areas, and scenic areas and their resources, has been an integral part of the management philosophy of the National Parks Service since its beginning. Its acceptance has been national. The statutory authority to do the job has been defended and broadened as the years passed.

Wilderness, as experienced in 1805-1806 by Lewis and Clark and later by John Muir and other U.S. forebears, is no more. Like our youth, it can never be completely recaptured. Nevertheless, we must preserve what is left and, to the best of our ability, restore what once was. This is a complex and never-ending task. The National Parks Service Management Program is designed to safeguard and preserve the quality of wilderness wherever it is assigned to our charge. We seek these goals in all backcountry, whether it is a part of the national park or is designated or proposed for wilderness classification. In those instances where our management fails, we invite all observers to report the failures to us. We have noticed no particular reticence in this regard.

I know of no better way to assure the general public and devoted wilderness advocates that our wilderness management is applied honestly, fairly, and in full measure than to present our management program for all to observe and to comment upon. Changes are taking place, some of which we have little or no control over. We must have the flexibility to change, always keeping in mind our basic mission which requires that, in our judgment, if we err it must be on the side of preservation.

The initial goal of natural resource management focuses on reserving unique areas and providing the recreating public access to them. There was a pressing need for access roads and comfortable accommodations. Early depredation of wildlife, timber cutting for buildings and fuels, and other uses made it apparent that a much more protective management program was necessary. Evolving preservation concepts first placed emphasis on protection of things such as geysers, trees, magnificent vistas, special historic sites, or routes of travel and wildlife. Some things were considered "bad," such as the predatory wolves, grizzlies, mountain lions and so forth. Others, such as elk, deer, and bison, were "good." Management sought to eliminate the so-called "bad" resources while increasing the "good" resources.

Changes became necessary after research evidence mounted, indicating that poor resource conservation, or lack of area-wide management, would not protect designated parks and preserves. The Secretary of the Interior's advisory board recommended in 1963 that the National Parks Service protect "vignettes" of

primitive America. We soon found that we could not perpetuate vignettes because we manage changing, living systems. Gradually, we developed a philosophy of protecting the whole environment. Full stewardship preservation requires understanding of how these natural systems function. Further, management techniques need to be such that ecological systems are allowed to evolve as naturally as possible.

Population growth, a turning to the outdoors for recreation, modern technology and all the attendant impacts have created a climate which permits few mistakes. We must have adequate funding, sound information and organizations staffed by people who are qualified to make decisions that make preservation work. Further, our programs must be applied with the cooperation of adjoining land managers—federal, state, local and private. Increasingly, too, it becomes apparent that air quality, water quality and climate know no national borders and may, in fact, be global. So, what are the ingredients of our management program?

Management Policies, published by the National Parks Service in 1978, states the general national policies for the management of the National Park System areas. Each area manager is responsible for the preparation of a general management plan. This plan must state the park's purpose and management objectives. All land and water are classified into natural, historic, park development and special use zones. Resources in the natural zone—where wilderness and backcountry are located—are managed to ensure that natural resources and processes remain largely unaltered by human activity. The general management plans interrelate proposals for resource management, interpretation and visitor use, and permit general development. An assessment of alternates specifies the consequences to be expected under varying management approaches. These plans must be prepared with open, cooperative regional planning, public participation and review, and consultations with park advisory boards and regional advisory commissions.

We are currently revising our management policies, as a part of a 12-point plan and a 32-point action program, to guide and safeguard the National Parks System in the future. As a part of this effort, we seek to develop a nationwide, systematic resource strategy, improve wilderness management and pursue cooperative agreements with land managers, owners and communities near park units and particularly near wilderness areas. Further, we would increase public understanding and participation in the roles and functions of the National Parks Service. We will reemphasize that our "management policies" are the basis for all future decision making.

A Wilderness Task Force in 1986 recommended the existing "management policies" be changed little. The task force recommended that we make management of wilderness more systematic and consistent from area to area and nationwide. The group further recommended that we designate wilderness coordinators in the national office and in each of the 10 regional offices; perfect our wilderness management techniques; examine permissible carrying capacities;

increase education and training of our wilderness personnel; educate the public; and, coordinate management with other agencies. The latter would involve a National Wilderness Coordinating Group seeking cooperative activities with all land managers surrounding a wilderness area and developing interagency program teams.

Wilderness is thought of being from the surface land to the tops of the trees. We dared to suggest that at Mammoth Caves and other caves that are underground, we should develop in these areas underground wilderness areas. We should establish these as part of the responsibility of the National Park Service in developing wilderness concepts. So we will be developing underground wilderness areas to protect these underground resources that are our responsibility.

In addition, we have recently received legislation that indicates that both the Congress and the administration recognize that silence is an attribute of a national park unit. So, in the development of plans where we are having difficulty over flights by aircraft, we are proposing and suggesting that in making these areas flight-free zones we are also extending the wilderness concept upward above the tops of the trees. So, we believe that in following these two pieces of legislation, we will establish forever the fact that wilderness not only is from ground level to the tops of the trees but it extends underground, under the water and above the trees for an unlimited distance.

Management of parklands possessing significant natural features and values is concerned with ecological processes and the impacts of people upon these processes and resources. It is interesting to note that conflict develops around the question of long- versus short-range planning and management. The National Park Service's responsibility is the protection and conservation of the natural and cultural resources entrusted to it forever. So we must think in long terms while most people are thinking in short terms.

In the absence of adequate knowledge, operational programs are aimed at maintaining the status quo. We seek especially to avoid long-term or possible irreversible impacts upon priority areas and on our research that we are developing for these priority areas. For example, management policies which must be reflected in the natural resource management plans include:

—Agricultural uses are not permitted in natural zones.

—Commercial grazing is not permitted in any park where such use is detrimental to the primary purpose for which it was established. Grazing is permitted where authorized by law or where grazing rights have been granted for a term of years as a condition of land acquisition. Trail stock grazing is permitted where incidental to passage through natural areas, but under very careful management of each sight used.

—Native animal life shall be given protection against harvest, removal, destruction, harassment or harm through human action, except where: hunting and trapping are permitted by law; fishing is permitted by law or not specifically prohibited; control of specific populations of wildlife is required for maintaining a healthy park ecosystem; or, removal or control of animals is necessary for hu-

man safety and health. So hunting, trapping and other methods of harvest of native wildlife are not permitted by the public in natural zones except where specifically required by law.

—Fishery management shall be specifically aimed toward preserving or restoring the full spectrum of native species and regulated for native species so that mortality is compensated by natural reproduction.

—Threatened and endangered species and their critical habitat requirements are identified. Visitor use and access are controlled so as to perpetuate the natural distribution and abundance of threatened and endangered species and to protect the ecosystem on which they depend.

—Exotic plant and animal species are managed, up to total eradication, when they threaten protection or interpretation of resources being preserved.

—Native insects and diseases are allowed to function unimpeded except where they threaten to eliminate other native species; threaten to spread outside the area; threaten endangered species, unique plants or communities; or where they pose danger to public health and safety. Insect and disease control in wilderness areas is limited to the minimum necessary to prevent escape from the wilderness environment.

—Natural fires are recognized as natural phenomena and are permitted to influence the ecosystem so that truly natural systems will be perpetuated.

—Waters of the parks are a primary resource on par with wildlife, forest, geological and historic features. Emphasis is placed on conservation of water so as to meet the needs of visitation without the addition of water development.

—Terrain and vegetative cover are manipulated when necessary to restore natural conditions on lands altered by human activity. This includes removal of man-made features, restoration of natural gradients, revegetation with native species, restoration of natural appearance in areas disturbed by fires and control activities, and minor rehabilitation of visitor-impacted areas.

—Shoreline processes—erosion, deposition, dune formation, inlet formation and so on—are allowed to take place naturally except where life and property are threatened.

—The National Park Service is responsible now to try to eliminate many of the exotic plants and animals that exist in our National Park units. We are finding that we are getting good support in that program. For example, we have eliminated practically all of the burros in Death Valley. The few that are remaining will be shot on sight by our rangers. In spite of the emotional impact of that kind of a statement, I can tell you that the public is now supporting that concept wholeheartedly and so we are in the process now of a major job of trying to eliminate the wild pigs and the exotic plants from all of the units of the National Parks Service. It is not going to be an easy job. It is going to take a considerable amount of time to accomplish that objective, but we're bound by our mandates to accomplish that objective and we are working at it very, very hard.

Throughout the country we have about 20 cooperative park study units that

carry out research and advise parks and regional chief scientists on specific resource management problems. These bring close interaction between the scientist and management staffs. Management planning occurs side by side with research, when required. These units serve as a catalyst for developing interagency agreements with the Forest Service, the universities and others interested in mutual problems. In one region alone, this arrangement was once compared to having a science staff of 200 available on call to park managers. And the benefits are similar in other regions. Under our current alignment, the Cooperative Park Study Units research projects and interaction with managers extend directly to the regional offices and the individual park units. I might say that the increased entrance fees will make it possible for us to spend something in excess of $76 million next year for research, interpretation and resource management.

Perhaps our major challenge today is the preservation of wilderness in the face of increasing public use. Backcountry use nationwide has grown. There is indication that this type of recreation is now leveling off. Migration of populations to the Western states is major factor. Our great Western natural parks are bound to be affected by proximity of increasingly larger populations.

It seems to me the National Park Service has a major problem in that we are going to be faced with ever-increasing pressures on the units of the National Park System which we once thought were islands secure in themselves. Through the increased research that we have been doing, we realize that this is not true, that the parks themselves are not islands and that they must be protected from within and on the outside. All of our managers now are being trained this way to protect the parks from within as well as to work with all of the agencies that surround the National Park system and protect those areas from the outside interest of development. They also try to mitigate any development in order to make it less difficult for us to manage the parks themselves. We are doing a great deal of work along these lines to make sure that the information is available to us to do a better job.

ECONOMICS, DEVELOPMENT *and* ENVIRONMENT

"Damage can result when people fail to recognize that the future of the human race depends to a large extent on a sensible compromise between economic and environmental considerations."

—David Rockefeller

FINANCING CONSERVATION AND SUSTAINABLE DEVELOPMENT

ECOCONVERGENCE—ECOLOGY AND ECONOMICS FOR PLANETARY SURVIVAL

Maurice Strong

Why does the World Wilderness Congress deal with such a broad range of issues? Why are we talking about the world economy, the debt and trade issues and the poverty issue, as well as moral and ethic guidelines, in a wilderness congress? Because we have learned that protection of the world's wilderness areas cannot be divorced from what is happening in the rest of our global environments.

More than ever before, we have come to understand that the world is no longer made up of individual governments, economic systems, national or ethnic groups. We've come to regard the world as a system, as a living organism. Just as a prick on your toe can infect your whole body, what we do in any part of the body of our planet affects all of it—and all of us.

We have also come to realize that our species is in a whole new situation. In this century alone, population has grown from 1.6 billion to 5 billion. By the end of the century, it will grow by another billion—and four out of five of the world's people will live in developing countries. Industrial production has also exploded, by a magnitude of 50, and fossil fuel use has increased by 30—most of this since 1950. More land has been cleared for cultivation in the last century than in all previous human history.

Overall, the condition of our environment and thus our natural resource base continues to deteriorate. Devastating droughts in Africa, acidification in the northern parts of the world, the disappearance of species, the destruction of the tropical rain forests, climate change, ozone depletion—these are all global issues. All of these ecological disasters have occurred at a level of population and human activity far lower than those that will exist in the next century. All of them are connected with human failure—ignorance, policy mismanagement and ecological insensitivity. And, more than anything else, all of these problems have been exacerbated by poverty, poverty which forces people to degrade their environment and to destroy the very resources upon which their future depends—in an intolerable, vicious circle.

The 4th World Wilderness Congress marks the emergence of a new alliance dedicated to finding new solutions to the problems of our earth. Not only environmentalists, but also scientists, politicians, financiers, businessmen, leaders of North American and African indigenous peoples, leaders of non-governmental organizations, development-assistance agencies and multilateral agencies—all these groups are combining forces, seeing themselves as allies in the search for an economically and environmentally secure future for humanity. The wisdom of indigenous and tribal people and the passion and expertise of environmentalists, combined with the business and scientific approaches, are forces that will develop the best, most holistic solutions.

What we are recognizing most clearly is that the only possible solution to our environmental dilemma is a new era of economic growth, an era of sustainable development for all countries. This is only possible if we change our ways. We must create a more positive synthesis between environment and economics, what I would call an ecoconvergence. Saying that this must occur doesn't make it happen, doesn't remove the conflicts and the difficulties, but it does provide the objective within the framework, within which we must all work. Clearly, there are cases where environment and conservation on the one hand will be in conflict with an immediate economic objective, but, broadly speaking, they are and must be compatible.

We must try to find ways for environmentally sound projects to pay for themselves. To do this, we will need innovative thinking and action, especially if we're to meet the financial needs of the developing countries. For one thing, we must improve cost-benefit analysis to take into account longer-term environmental benefits and costs. Many conservation projects do not show a good rate of return in conventional economic terms, of course, but we may be encouraged

by the evidence that other such projects do, in many cases bringing a higher economic return than more conventional, infrastructural projects. For these profitable projects, we must develop new sources of finance from private investment.

We must also take a look at the role of development assistance and learn to make better use of existing funds. Aid is essential but it is not enough, as we learn from the World Commission on Environment and Development Report—a report that might well serve as a basic text for this new era, a guidebook for all. We also need to promote the synthesis of environment and economics through changes in the macroeconomic and policy structures. The developed nations must work in new ways with the developing world, toward the kinds of economic growth that will meet the legitimate aspirations of all nations for a fair share of the world economy. We need to provide markets for products of the developing countries and give them a fair deal in trade and for carrying the burden of their debts. Removal of agricultural subsidies is directly relevant to developing countries, since it would enable them to do what they can most competitively, and would stimulate them to sell their products to us. These debt and trade issues, the science and technology transfer issues, private investments, redistribution of global industrial capacity—all are absolutely germane to the central subject of environment. Developing countries must be full partners, not just marginal recipients of our bounty. We must understand that their economic and ecological health are intimately related to our own economic and environmental security. If they are going to share in the responsibility for our planet, they must be able to share the benefits.

The World Wilderness Congress presents some of the new ideas we'll need. The World Conservation Banking Program demonstrates how private funds can be mobilized to meet conservation-related development needs and still achieve an effective economic rate of return. The Tropical Forestry Action Plan is an excellent example set recently by a number of important non-governmental and intergovernmental organizations—the World Resources Institute, the World Bank, the FAO, the IUCN and others—of how to tackle the immense problem of the destruction of tropical forests. The idea of swapping debt for environmental action is another new idea with great potential. Those who make economic policy—leaders of business, ministers of industry, agriculture, forestry and transport, who also make environmental policy—must be accountable for their effects on the earth.

The future of the planet is everybody's responsibility and it involves everybody's future. No longer can we secure our individual futures and those of our children by our own individual activities and plans. If we do not join in ensuring planetary survival, we will be building our own individual houses on sand. Cooperation, caring for and sharing with each other are not just pious ideals but are imperative for economic and environmental survival. Most importantly, such attitudes also strengthen human morals and spirit, the most important values which undergird all economic and environmental factors.

It is sometimes said that conservationists are always "preaching to the converted." Yes, in a sense we are. But the circle of the converted has widened broadly in recent years, as the 4th World Wilderness Congress makes clear, and it is our job to widen it further, much further. We must make it clear that worldwide cooperation and caring for each other are essential. In many ways we are all parochial, but we can develop a global form of parochialism that will embody the truth of those words of Chief Seattle, "If we care for the earth, the earth will care for us."

ECONOMIC GROWTH AND CONSERVATION: PARTNERS, NOT ENEMIES

James A. Baker, III

Those who know some economics may have heard of something called the Phillip's Curve. This was the rather startling theory, popular in the 1960s, which stated that in order to reduce unemployment you had to tolerate higher inflation or vice versa, that to tame inflation you had to have high unemployment. This theory never did stand the test of time.

Yet I sometimes think a cousin of the Phillip's Curve survives in the way we often look at environmental policy. We seem to assume that to protect the environment, we must have slow economic growth. For if we desire fast growth, then inevitably we will degrade the environment.

I don't subscribe to this bleak choice any more than I believed in the Phillip's Curve. I think growth and conservation can coexist. Indeed, I'd go so far as to restate things in a much more positive way: that growth and development are essential for conservation, and conservation is essential for growth. Despite some assertions to the contrary, these concepts are not mutually exclusive. In fact, they should not necessarily be deemed mutually antagonistic.

I am not saying that growth and development do not put new and difficult strains on the natural environment. The lesson of centuries is that they often do—and with tragic results when men and women are careless.

Yet I also think we have to be realistic about those strains. They are going to continue because the drive for growth and development will inevitably continue. No U.S. political leader who wants to remain in office will endorse a slow-growth platform.

In the same way, no leader in the developing world is going to tell his countrymen they cannot aspire to the same standard of living as Americans simply because their ambition strains the ecology of the rain forest. Those of us who care about conservation will not persuade anyone with a "Limits to Growth" philosophy.

Instead, I think we have to pursue, both in the United States and abroad, a philosophy of growth combined with conservation. This philosophy has its roots in America's own conservation heritage. Gifford Pinchot, who headed America's Forest Service early in this century, believed in what he called "utilitarian conservation." At the risk of oversimplification, the concept is very much like a growth and conservation philosophy.

Pinchot's insight happened to fit beautifully with the mood of the times and with the views of his president, Theodore Roosevelt, and he was able to accomplish a great deal. Pinchot—with his political skills and practical vision—did more to preserve this nation's environment than did most of his more celebrated, and more purist, contemporaries.

Conservation, Pinchot once said, is "the greatest good for the greatest number over the longest time." It is a sensible definition and a catchy political slogan at the same time. Under Pinchot and Roosevelt, the amount of forest under control of the U.S. Forest Service tripled and our great national treasure, the National Parks System, was greatly enhanced. Pinchot and Roosevelt never lost sight of the fundamental importance of a growing economy, and so they never lost wide public support for their energetic conservation programs.

As important as these political realities are, we can also make a strong, practical, economic case for the benefits that growth can have on conservation, especially in the developing world.

At a basic level it is simple common sense. Expanding wealth eases the pressure that the poor feel to work constantly just to survive. In short, it creates opportunities for leisure. And when people have the luxury to take time off from the burdens of subsistence, they invariably turn their attention more to the condition of the environment and the quality of life. They begin to care more passionately about the cleanliness of rivers, or the preservation of wildlife.

We saw this in our own nation's history, as conservation became an important political movement only after the strong industrial growth of the late nineteenth century. And we saw it again in the 1960s after another run of industrial growth, rising incomes and expanding time for leisure.

The same holds true today in the developing world. Often the countries with the poorest conservation records are the poorest countries, those that consider clean rivers or the preservation of natural wildlife habitat something to care about only after their citizens have made a living or fed their children.

In some of the countries of Africa, for example, we've seen great pressure from farming put on the natural ranges of elephants and other wildlife. The populations of these countries have exploded and each family naturally wants its own plot of land. Tragically, these countries have often pursued mistaken

policies that have damaged economic growth and denied their people opportunities other than farming, such as work in industry or in urban centers that might ease pressure on the land and on that continent's inspiring and irreplaceable wildlife.

The story is very different, however, in some of the more successful parts of east Asia. In Korea and Taiwan, industrial development has eased the pressure on the environment from farming by drawing workers into the cities, just as it did decades ago in our own country.

It's certainly true that industrial development has created new problems such as water and air pollution. But at least growth has helped these nations escape the environmental degradation of the poorest countries. As a by-product of their increased affluence, we've also seen growing public concern in Korea and Taiwan about the new problems of pollution. I'd submit that here is a clear case of growth aiding the cause of conservation.

I see a trend away from the idea that conservation is a luxury that wealthy countries can embrace while the developing world faces more pressing economic problems. The political leadership in the developing world is increasingly responsive to the underlying reality that sound conservation is good economics. It recognizes a direct correlation between wise use of natural resources and economic growth. The perceived tension between the need to create economic stability and the obligation to preserve resources for future generations may be easing.

I think we can make an even stronger case when we look at the new and advancing technologies that tend to accompany growth. Peter Drucker, the business and management expert, once said, "The only means of conservation is innovation." And he's probably right. We've seen technology help us better dispose of industrial waste. We've seen advances in biology help us restock rivers with fish and reforest our woodlands.

Perhaps most significantly, the industries that we consider high-tech—important growth industries of the future for America—are primarily less intrusive environmentally than the industries of the smokestack age. Simply compare the quality of the air and water around Pittsburgh or Chicago of 40 years ago with the air and water around Silicon Valley or Route 128 near Boston today.

I am not suggesting that new technologies will lead us inevitably into some brave new world of environmental safety. They clearly present their own dilemmas and challenges. But these technologies—and the economic growth that spurs and sustains them—can often help us to ease the environmental problems of the present if we apply them wisely.

CONSERVATION AT THE WORLD BANK: A NEW EMPHASIS

General principles also have practical consequences. Perhaps I can give a better sense of that practical impact by telling how the Reagan Administration has been trying to encourage greater concern for the environment in the way the World Bank promotes economic development.

The World Bank and some of the other development banks have not always had the best conservation record. Indeed, I think even most bank officials will acknowledge this. They'll admit that in pursuing the very hard work of economic development, they may not always have given the environment enough attention.

We've all heard of the roads and other development projects in tropical regions, assisted by the World Bank, that have encouraged the uprooting of rain forests without regard for conservation or sustained use of this precious land. Because of the rain forest's delicate ecology, the result has too often been erosion, despoilment and ultimately disappointment, even for the once hopeful developers of this land.

Another example of environmental damage exists in the African nation of Botswana—a superb country with an outstanding record of political stability and democratic tradition. I couldn't help but admire the magnificent wildlife on that nation's splendid savanna. At the same time, however, I also couldn't help but notice the pressure on parts of that savanna from overgrazing by livestock.

As U.S. Treasury Secretary a few years later, I happened to see a report on a World Bank loan to support grasslands development in Botswana. I made sure that, in its role as a major contributor to the bank, the U.S. Government urged the bank to make concern for environmental management a central part of lending criteria for sub-Saharan Africa. Earlier this year, during the visit to Washington of Botswana's vice president, we discussed the importance of that issue. And the bank is, in fact, incorporating these concerns into its development lending.

What the Reagan Administration wants the World Bank and the other development banks to do is make environmental analysis, systematically and routinely, a central part of every loan proposal. We want the bank to draw on the expertise of trained environmental analysts—both from its staff and outside consultants—who know developing countries and can assess just what impacts any new project or policy will have on the ecology of those countries. It should then incorporate that analysis into its lending decisions and assistance from the very beginning of the lending process.

We have found a receptive audience at the development banks when we've made these points among bank officials, among other contributing countries and even among borrowing countries such as Botswana. We had a frank discussion of these issues at the meeting of the World Bank and IMF Development Committee in Washington last spring. And we expect to have a similar discussion and to make further progress on specific proposals at the next World Bank/IMF meeting.

It is my goal that by the end of this process the bank will have adopted specific procedures that make conservation and environment a centerpiece of its development program. All nations, rich and poor alike, can't afford to support development that does not also support the environment any longer.

In that spirit, we at the Treasury Department are looking closely at ideas that some of you here have brought to our attention that would convert some

LDC bank debt to local currency specifically earmarked for use for environmental activities and sound development projects. There is some question as to whether this would require legislation or might be done by interpretation of current rules. We still are working on the complicated technicalities, but I can tell you this: We believe in the concept and are working to produce results.

In our debates about the environment, we need voices of moderation and common sense. Voices like yours, that recognize the importance of preserving our environmental heritage, but that also understand that the importance of continued economic growth and progress are valuable contributions.

We cannot expect to conserve our environment if we preach a policy of limited growth and opportunity. We will not succeed in achieving our conservation goals if we deny to the citizens of the developing world the dream that built our own nation—the dream of economic opportunity and a better life. But I believe we can succeed in preserving that heritage if we make clear that the fulfillment of that dream depends upon conservation. Conservation should not be the enemy of prosperity; it should sustain and enrich our prosperity.

A NEW FRONTIER IN DEVELOPMENT AND THE ENVIRONMENT

Charles Lankester

I shall briefly describe the world economic scene as I see it, international aid flows in particular and how these have an impact on the environment; the distinctive characteristics and responsibilities of the United Nations Development Programme (UNDP); and illustrate how progress has been achieved in tropical forestry and energy and what lessons may be learned from these models.

Although official development aid to the developing countries rose to $37 billion in 1986, this amount represented a sharp decline over 1985 figures, as higher official aid failed to balance the continued net decline in export credits and commercial bank lending. It is noteworthy that agricultural aid, including land-use surveys, irrigation schemes, forestry and wildlife, and extension work, is estimated to constitute 26 percent of this aid, and that agriculture's share has increased by about 4 percent over the last eight years.

But I think the figures show us that we must reconcile ourselves to the fact that significant increases in such aid flows are unlikely to occur in the short term. Readjustments within the package will continue but are unlikely, in my opinion, to be significant. Consider two facts: firstly, that noble American initiative the Marshall Plan, initiated 40 years ago, channelled $3 billion into Europe each year for four years, or 1.3 percent of the gross national product (GNP) of this country. As the Administrator of AID recently noted, a comparable sacrifice today would correspond to a $50 billion program, or $13 billion more than the global aid flow I referred to a moment ago. Secondly, at the present time, only four Scandinavian countries amongst the entire donor community have reached the current UN target of 0.7 percent of their GNP for aid.

Against this background of resource availability, what other challenges have confronted decision makers in the developing countries? The three most commonly referred to are:

- Declining standards of living. In Africa today, for example, we have lower standards of living than we had ten years ago;
- Burgeoning debt-servicing schedules; and,
- Capricious and disastrous markets for the primary commodities exported from these nations.

The facts are well recorded and understood. I would ask you to just reflect that since the Special United Nations Session on Africa some 15 months ago, commodity earnings by these African nations have declined by $19 billion.

Confronted by an inability to service their debts, many countries turned to the IMF for advice. The prescriptions were almost unanimous—to restrain demand rather than to increase supply—and they were unpopular. Certainly they had certain desirable effects. Inefficient factories were closed down, unproductive jobs in the public sector were slashed and food subsidies were reduced. But we have all read of the consequences and the social unrest that these policies caused. These adjustments, then, were achieved at tremendous social cost. Expenditures on health, nutrition, education and housing have all been drastically slashed, just to cite some critical subsectors.

Against this background of draconian cuts, how did the environment fare? With few exceptions, it didn't. And it wasn't just the pure environmental projects, but even the environmental content and safeguards of many projects that went by the board. I well recall the cool efficiency with which environmental projects were withdrawn, postponed and canceled in the late 1970s and early 1980s. And when progress was achieved, it was often through the extraordinary energy, dedication and persuasiveness of the private sector, most notably the NGO community and its work in national parks and the wildlife fields.

Now, fortunately, a shift has occurred. The sharp focus on demand restraint that began in the late 1970s began to blur by 1984, and today it is increased economic growth (sustainable economic growth) that captures our attention.

UNDP believes that, on balance, a renewed emphasis on growth is appropriate, particularly when it is accompanied by a strengthening of basic human services. But we must at all costs avoid a repetition of those examples whereby growth was achieved at the expense of the natural resource base.

Confronted by this situation, the challenge facing the leaders of the developing countries and development agencies is quite daunting, particularly given the magnitude of the environmental degradation that has occurred since the Stockholm Conference under Maurice Strong's leadership in 1972. To what am I referring? You can take your choice. Environmental deterioration and loss of soil fertility have undermined the ability of many developing countries to feed their peoples. Projections indicate that unless trends are reversed by the end of this century, as many as 65 developing countries will be unable to feed their populations. Deforestation has reached 27 million acres a year. Eighteen and a half million square miles are threatened by desertification. And population—we cannot avoid the subject—must be discussed. In July 1987, the five billionth person joined our spaceship earth. Africa's population growth is three times that of its growth in food production. Unless Nigeria can hold its numbers down, its population by the year 2040 will exceed the population of the entire African continent today. By the year 2000, three of five cities with populations of five million or more will be in the developing world—a developing world with ten cities where over 30 million people will have to live.

The situation is bad. It demands our best skills and cooperation. We cannot afford to fail. In this climate of growth management, the imperative needs for sound environmental planning and management of our heritage must receive renewed attention.

Environmental management and sustained economic growth are global problems and global responsibilities. The life of everyone is threatened by deforestation, desertification, the pollution of our oceans and our atmosphere and other injustices. Sustained economic development will only be possible if decisive action is taken today.

Characteristic of many of these environmental problems is that they recognize no frontiers. Think of acid rain, or of dust in the Bahamas that originates from dust storms in Mauritania in western Africa. Think of the scourges of onco, or river blindness, and the problems of international trafficking in wildlife and the global imperative to conserve germ plasm.

Common interests require articulation through international cooperation, and UNDP is a global organization. It is the world's largest grant-assistance agency on a multilateral basis. It is multilateral because we receive voluntary—and I do emphasize voluntary— contributions from as many as 150 countries in the whole range of the development spectrum. We provide assistance through a global network of some 112 field offices to about 130 developing countries. To give you an order of magnitude, our 1986 expenditures were approximately $690 million. And our assistance is not tied to the provision of particular resources to particular countries. The technical assistance that we provide, whether it is

experts or consultants, equipment or materials, is drawn from the best sources that we can identify: either from market, mixed or centrally planned economies. Our task is to provide unbiased, objective counsel to governments, to transcend political and economic tensions and the patterns of development. We have no ax to grind. And many governments specifically request our guidance on activities with subregional, regional and global ramification. Thus our involvement in these issues is substantial and it is hardly surprising that an in-house review we undertook two months ago showed that the contents of our portfolio pertaining to the environment has risen from some 10 to 20 percent since 1976 and that expenditures over the same period have tripled.

UNDP has also a special—and critical—aid coordinating responsibility with recipient governments. Experience has shown that separate inputs by a multiplicity of donors usually does not add up to a coherent program. Common sense dictates that we reduce the number of aid missions that: (1) collect data in a different format; (2) have varying procedures and regulations; and (3) which unbearably strain the human resources in ministries of planning, finance and natural resources.

Roundtable discussions between the donors and the recipients and national capacity surveys have become critical coordinating mechanisms and are especially important responsibilities for our organization. Please, then, do not see UNDP as just another source of funds for developing countries. Maintaining dialogue constantly in each country,(providing impartial advice on what may or may not work and why, why failures that have occurred should not be copied, why successes in some other countries should not be copied,) is our special responsibility. Only when our assistance fits into a sound development strategy is it provided.

Two recent initiatives in which UNDP was engaged with other development partners, including NGOs, illustrate important patterns that are emerging in development assistance.

During the late 1970s and early 1980s, the magnitude and impact of tropical deforestation really began to be realized by development planners. But there was no coherent global program and aid flows were actually slipping. It was as if we had given up on the problem. Where were the foresters? They were overburdened and struggling with technical problems and forwarding technical facts to budget committees and ministries of planning and finance. But seldom did their presentations achieve more support. Often the reverse occurred. So an international program, initially conceived in the minds of just three or four people, was conceived.

The impact of deforestation on agricultural trade, health, school attendance, the transportation and energy sectors, employment and the balance of payments was studied and articulated. The social and economic costs of inaction were measured. How many more children had to die because fuelwood was not available to sterilize water or to cook their cereals? How much grain production was foregone in the developing countries because crops and animal residues were

being used as fuelwood substitutes? And how many environmental refugees had to be given basic services as they retreated to the cities after deforestation and desertification overtook their own villages? These numbers had an impact. The facts were laid out, key development officials and world leaders were advised, and the press was deliberately engaged as an ally. Political will and interest by donors and recipients gathered momentum. Success stories were collected, analyzed and information shared. Enthusiasm built up. And in this process not only was the top-down approach required with political and financial leaders but also the constituency of the people, the grass roots, had to be and is still being consulted.

Finally, attainable targets were set, consortia formed, coordinating mechanisms established and, not so surprisingly, there emerged a global Tropical Forestry Action Plan. It is a plan that still has many flaws and needs constant correction, but which in just two years has achieved its five-year target of doubling aid to the sector. With better knowledge of what our priorities are and with clear objectives, the entire development community is moving forward on this subject with renewed purpose.

The second example I take is the energy sector, to illustrate how the perceptions of development needs have evolved in the past decade and what the response by the international community has been. Earlier investments in this sector were heavily biased toward large-scale infrastructures, dams with hydroelectric and irrigation objectives. Some of these projects proved uneconomic, however, and they often failed to take into consideration the needs of the local population. All development agencies have a terrible responsibility to make sure that the real economic costs of such schemes are brought home and fully understood by the leaders of the developing countries before these projects are implemented. Typically in the case of dams, I am referring to the necessity for doing watershed management and reforestation upstream.

The energy management assistance program, called ESMAP, was launched in 1983 as a joint program between the World Bank and UNDP. It is directed at assisting the urban and rural poor to meet their energy requirements and to meet them in a manner which minimizes impact on the natural resource base. The focus is on the household and has necessitated combining again the top-down with the bottom-up approach. Other donors, finding a well-coordinated plan that corresponded to national priorities, quickly responded and within just two years became the major source of financing for the program. Already 10 other donors are involved with us in some 60 developing countries with special attention on sub-Sahelian Africa. It is noteworthy that virtually all of the recommendations of the Brundtland Commission which relate to the energy crisis in the developing countries are being systematically addressed by this ESMAP program.

Please note the common characteristics between these efforts:

- problem identification;
- gaining the help of the media to build awareness and political will;

- forming a consortium of donors;
- emphasis on social as well as economic benefits;
- engagement of the private sector, notably the NGO community, and involving women throughout the development process; and,
- how regular coordination and consultation was organized between the donors and the recipients.

Good projects do find adequate financing. The proposed World Conservation Banking Programme would provide a mechanism for any government, government agency, aid agency, multilateral development bank, corporations, foundations, NGOs and private citizens to join together in a communal response to finance and cofinance the necessary environmental projects that others have eloquently talked about and outlined. Pioneering and innovative thinking and consultation have been problems for over two years. Clearly there are very major headaches and problems to be resolved, but in UNDP we think it is time to take this idea out of the closet and have a far broader and more systematic consultation with donors and recipients, and I particularly emphasize participants because many of these countries are blocking the use of foreign currencies earned from development and private enterprise activities within their borders.

I can announce UNDP's intention to join as soon as possible with two or three other organizations, ideally a multilateral financing institution and a strong bilateral aid program, to finance an independent in-depth feasibility study of this proposed World Conservation Banking Programme. Collectively our organizations should risk some resources to determine whether this scheme will fly and if so, how to build and launch it properly. In conducting this study, I believe we must draw on a far wider circle of pragmatists, enlightened leaders and financiers—and please note I separated them out—than has been the case to date. And we should try to have a broader spectrum of support, for this will be absolutely essential before we can go any further with this proposal for a conservation facility. We must reach out beyond the advocates of the scheme so far.

The UNDP is in consultation with probable partners in this exciting investigation and will be very interested in the outcome of further deliberations on this subject.

ECONOMICS AND THE NATURAL ENVIRONMENT

D. Jane Pratt

There is an urgent need to defend earth's natural resources. The hour is late for action on the global environment, but not too late for effective, concerned, consistent measures of conservation.

It is my belief—and it is also the operating policy of the World Bank—that sustainable development and the nurture of human resources depend on a sustaining stock of natural resources. That statement is a truism, not a pietism, but it is only the beginning of wisdom. It establishes a sense of direction, but not a road map for environmental or economic progress. The World Bank is now engaged in charting such a course.

For 41 years the bank has been an international investor, first in the postwar reconstruction of industrialized nations, then in the development of Third World economies and societies. We provide investment financing and technical advice, primarily to governments, and, until a few years ago, primarily for large-scale projects in industry, agriculture, health, education, family planning, housing and, neither last nor least, conservation. The bank's central purpose is also its original one: to promote steady economic growth as the surest means of alleviating poverty in the world.

In 1970 the World Bank became the first multinational institution of its kind to formulate an environmental policy and establish a high-level adviser to assure its implementation. But until very recently the policy largely amounted to a developmental injunction, similar to that of the Hippocratic Oath: Do no harm. We have learned, however, that prevention is not just difficult to ensure, but often inadequate to the goal of resource preservation.

Thus, we have done what large institutions do as a first step toward reform: we have created an environment department. Its mandate is to reach into all phases of the bank's investment and technical operations and to develop a positive program both for reversing environmental degradation and for assuring that nature's wealth is used for sustainable development. In short, its mandate is to make sure that the bank unfailingly implements in practice what it has long embraced in principle and to harness the enormous financial and intellectual capital of our institution in the service of sustainable development.

Such development, as the World Bank's president, Barber Conable, declared, "depends on managing resources, not exhausting them. Economic growth based on any other premise is a costly illusion." That principle is the foundation of a genuinely new and exciting development discipline: the endeavor both to analyze the environmental consequences of economic policy and to harmonize

long-term profitability and long-lasting protection. As Conable said, "Environmental action adds a new dimension to the fight against global poverty. It recognizes that sound ecology is good economics. . . ." Where short-term economic progress conflicts with natural resource preservation, and where conservation values are of paramount significance, we must endeavor to ensure that development defers to preservation. This is a monumental challenge where development is, as in much of the Third World, synonymous with simple survival.

The World Bank has long understood that poverty and overpopulation can do more environmental harm than industrial progress. That Malthusian reality is all too evident wherever too many poor farmers use too many poor farming practices. Slash-and-burn cultivation, overgrazing, and overplanting destroy the land and its capacity for renewal. It is not just logging and mining companies, after all, that assault the wilderness areas.

People who live in poverty on the edge of land that is—or should be—protected as wilderness, or reserves for tribal people or national parks can hardly be expected to respect those boundaries if the forbidden ground seems the only firm ground on which they can settle for survival. To protect against such encroachment, it is, of course, a great help to define boundaries. That is why the bank has been so glad to work with the Sierra Club and IUCN's Monitoring Center on initial efforts to digitize and map these sensitive areas. That initiative is a sound starting point.

Effective wilderness protection, however, requires more and more complex, environmentally sensitive development strategies. Among the solutions are intensified agricultural practices, land tenure adjustments, crop-pricing policies, industrial job creation and other actions by governments, local and international institutions to accelerate economic development in buffer zones, to manage the human pressure on the wilderness, and to manage, indeed, human pressures on our global biosphere.

Conservationists must help, not just to write laws and to draw demarcation lines, but to effect reforms in funding and manpower that can improve agriculture and stabilize population levels and thus relieve pressures on wilderness. Bank-supported programs that help reduce poverty by improving agricultural techniques, introducing new skills promoting energy conservation and controlling population growth are therefore not just developmental measures. They are also effective means of environmental protection.

The World Bank deserves the aid of environmental activists in promoting this patient, vital work throughout the developing world. We would be pursuing these antipoverty strategies even if they were not also investments in environmental protection. But in asking that they be recognized for their dual merit, I am not suggesting that the bank's role in defending natural resources ends with its offensive against Third World rural poverty and overpopulation.

Our commitment to sustainable development—to controlled, enduring economic growth—requires not just a sensitivity to limited natural resources

but an emphasis on renewable resources and on renewing them. That priority defines the juncture between environmental and developmental concerns.

What sustainable development teaches is that we must treat natural resources as productive capital—not just when they are mined or harvested as commodities on their way to market, but as working stock that is critical to continued production. Conventional economics knows how to measure man-made assets. It can put a value on buildings, equipment, roads, dams and sewers. It can define them as productive capital to be written off through depreciation against the value of production.

Our scale for valuing natural resources has been less precise. For too long, owners tended to look at natural resources in terms of the short-term income generated and to celebrate the way that income rises even as the assets disappear. Environmental consciousness has exploded that method of accounting. It has shown the world that the bottom line of environmental abuse is a hideous deficit between what we use up today and what we need to live well with tomorrow.

Still, that discovery only directs investment away from the worst forms of pollution and environmental degradation. It writes a readable debit column in the ledgers of economic policy makers. But it does not give them the other tool that investors always need, a cost-benefit calculation of the return on sound natural-resource management. It is that economic instrument the World Bank is now working to sharpen and to apply. Some specific examples of this effort to set a realistic value on the environment and on measures to develop and protect it simultaneously follow.

The world's forests are among our most endangered life support systems. Tropical rain forests, as you know, are vanishing at the rate of 11 million hectares a year, and the World Bank, which has put over $1 billion into forestry projects over the last decade, is planning to raise its lending assistance in this area from $138 million in 1987 to $350 million in 1989.

We have never questioned the urgency or the value of such work. Conservationists long ago succeeded in demonstrating the wisdom of renewing woodlands as they were harvested. In 19 industrial forest-plantation projects the World Bank has supported since 1978, the return on capital ranged from 10 to 16 percent. That is a very credible performance, but it turns out that doing good in other forms of forestry does even better.

Social forestry—helping small farmers and producers to grow trees for fruit, for fuel, for soil protection—had its start in initiatives aimed more at rural poverty than environmental neglect. It is paying off, however, in showing the complementarity of the two concerns. The results are in and the payoff is handsome—first in terms of environmental protection, but in financial terms also.

The rates of return on 27 bank-financed social forestry projects between 1978 and 1986 ran twice as high as plantation forestry investments. And that 20 to 30 percent rate of return ran parallel to the performance, between 15 and 21 percent, of five watershed rehabilitation projects in such fragile environments as Nepal and parts of India.

Even in Rwanda, where dense population has severely degraded natural resources, farm-level agriforestry work has given the land more trees now than grew there 25 years ago.

What these examples show—indeed, prove—is that it makes sound financial sense to invest for both humanitarian and environmental profits in bettering the lives of the poorest of the poor.

Agriforestry can increase productivity and income in the countryside and also protect the farming ecosystem, especially soil and water. It is a convincing instance of the potential harmony between sustainable development and sustaining nature. It is not, however, the only marriage the Bank helps make between ecology and economics. The other unions we are working to establish are broader in scope but less immediately obvious in their impact.

The opportunity to promote such compacts arises, ironically, from economic failure rather than perceived environmental danger. More and more in the recent years of global economic stagnation—decline and depression in many Third World countries—the World Bank has been providing support for a process that the euphemism-coiners call by the name of adjustment.

That's a soft word for a hard reality, for a sometimes revolutionary and always painful combination of austerity and reform in social spending, pricing policies, public employment and other macro-economic policies. Heavy debt burdens and institutional inefficiencies have forced nation after nation to change old ways for new, state controls for market realities, mistaken subsidies for the risks and rewards of trade liberalization.

Environmentalists have worried, understandably, that programs of conservation will be among the "old" expenditures sacrificed to the "new" exigencies. But justified as that concern is, it should not blind us to the opportunities to build environmental protection into macro-economic adjustment.

Again, from the perspective of the World Bank, the broadest field for action is also the one most in need: agriculture and the rural destitution of the hundreds of millions who live off the land.

In fostering reforms that aim to better their lives, we believe economic advance can bring ecological savings as well. The body of knowledge and theory on this point, however, is still thin. I hope you, as environmental activists, can help fill in the many empty spaces.

One problem—and one area where some remedies are becoming clear—is the pricing and other incentives that lead farmers to behave as they do.

Fragile soil that does not feed a family with a single crop will inevitably be denied the fallow time that it needs to renew itself. Overvalued currencies that encourage imports will inevitably deny farmers access to their own domestic markets, hence adequate incomes, for the produce of a single planting and harvesting cycle. Spending too much on industrialization will crowd out investments in the basics of rural productivity—from appropriate technology to effective transportation networks. Subsidies for pesticides will encourage their misuse; subsidies for livestock raising will lead to the destruction of precious

pasture; subsidies for irrigation can leave good land waterlogged and salt-poisoned.

And the contrary is true. Reformed agricultural-pricing policies can turn behavior around.

Increasingly, in what is called policy-based adjustment lending, and in the counseling that goes with its financial support, the World Bank is in a strong position to help developing nations join environmental and economic reform under a common policy umbrella. Our analysts understand the problems involved. No one fully understands the technical solutions.

Thus, it is here that I would urge environmental activists to turn some of their attention and energy. I hope you will become partners in the economic policy adjustment process. As the advocates of sustainable development look for new ways to protect and renew natural resources, the defenders of earth's ecology should join in that search with a fresh eye on the economics of environmental abuse and protection.

The governments, the organizations and the experts at the World Wilderness Congress have an unparalleled wealth of firsthand knowledge of the practices that threaten nature and endanger mankind. With hands-on, close-up expertise, the World Bank and its members can gain new insights on current and past policies. You have the power to advance conservation by helping to direct change.

I would ask you to look at your experience in a new light, to examine development not just for its attendant evils, but for the opportunities reformed growth policies are opening for redemptive, preservative treatment of natural resources. I would ask you to look at poverty, especially the rural poor and the population pressures they represent, as a danger to the environment every bit as grave as the waste products of the rich, the exploitative practices of the greedy and the indifference of industrial polluters. And I would ask you to regard the World Bank as your ally in a common cause, a common sense of economics and ecology as companion disciplines. Those in conservation have already helped by joining forces with those working inside to prod the bank to a new level of activism. We are grateful for that.

I said earlier that the World Bank provided its help in the past primarily to governments, primarily for large-scale projects. That practice is still what we are best equipped to conduct. But we are learning to appreciate small-scale possibilities as well as giant challenges. And we are relying on the help in the field of the army of non-governmental organizations that work, as we do, to combat poverty and despair. That army encompasses neighborhood associations in the cities of Venezuela and anti-Bwaki leagues fighting malnutrition in the villages of Zaire. It ranges from rural credit unions in Bangladesh to family-planning organizations in Turkey.

You are leaders in that campaign of conscience and consciousness-raising. If we are to overcome the global threats of pollution, deforestation, overpopulation, erosion, desertification and ozone depletion, we must clearly have a global

force mobilized in concert for the survival of the planet.

The World Bank is working to be a potent force for sustaining that struggle as it works to sustain development. We all seek the same ends. We can work best by working together.

THE NEED FOR PARTNERSHIP

David Rockefeller

Damages result when people fail to recognize that the future of the human race depends, to a large extent, on a sensible compromise between economic and environmental considerations. Extreme positions at either end of the spectrum are dangerous. There is an urgent need for a majority consensus when it comes to matters affecting human survival.

I see two extreme positions that could threaten the future of our world. The first extreme is the one taken by those who helter-skelter pollute our environment and destroy the globe's seed corn, as it were, for our children and grandchildren. The second extreme that gives me concern is that of those who would place all environmental concerns before the economic well-being of the people living on this planet.

In the past, the two fundamental drives behind these extremes—namely, economic growth and environmental protection—have been viewed by many as basically antithetical.

Happily, however, there increasingly seems to be some meeting of the minds—some understanding that man and nature can, and indeed must, work together creatively.

One of the more rewarding experiences for me in preparing for this paper was reading the report of the World Commission on Environment and Development. The very fact that the environment and development are placed together is, in itself, encouraging. The emphasis in the report on "sustainable development" is especially encouraging if we are to escape the tyrannies which are the product of extremes and absolutes.

The first extreme I refer to—that of the ravagers of our natural resources—is in part rooted in the belief of some single-minded businessmen that it is acceptable to sacrifice the environment of the future for present profit. Alas, there have been too many examples of people in the industrialized world who, out of greed, ignore pollution standards, destroy the landscape, poison the waters and create

such conditions as acid rain. There is no question but that blind pursuit of short-term economic gain can and has enacted its own form of tyranny on the rest of humankind.

To place all of the blame for unacceptable environmental behavior on industrialization or large corporations, however, is clearly grossly inaccurate. Much of the devastation of the world's environment, especially in today's world, is due to individuals who are without power and who are trapped in grinding poverty. Deforestation, for instance, is often more the product of actions taken out of desperation by the poor rather than through irresponsible exploitation by industrial giants. Some 70 percent of the world's rapidly growing population currently relies on wood for energy to cook and heat. The consequences of this fact are little short of disastrous.

A similar problem arises from overgrazing which leads, in arid areas such as the Sahel of Africa, to desertification. But for the individual farmer, over-grazing may be his only way to stave off immediate starvation. By the same token, it should not be surprising that for people in desperation it is more rational to slaughter rare wild animals for food or for sale to the affluent than it is to preserve these animals for their biological role in the world and for the enjoyment of future generations. A combination of ignorance and the desperate will to survive is at the root of a large part of the devastation of our natural resources which is taking place today.

Ecological damage, whether it is caused by the less affluent or the more affluent, has a cumulative effect which is far broader than the area of primary impact. Deforestation, for instance, not only causes floods and droughts in the nations where it takes place, it can also produce a change in the globe's climate and can further reduce the ability of the atmosphere to absorb the carbon dioxide created in increasing quantities by industry.

It is important to recognize, however, that in most cases there is a basic difference between factors contributing to ecological damage in the industrialized world as compared to the developing world. The industrialized nations have enough wealth and technological expertise to have options, even if some of these entail slower short-term growth rates, to preserve resources for the future. On the other hand, for many people living in developing nations located especially in Africa, Latin America and Asia, these options do not presently exist. People are simply too poor and their needs too pressing to allow them to take the necessary steps to preserve the environment on which they depend. Without prompt assistance from the outside, concern for the environment may literally be a luxury they cannot afford. For this reason the industrialized nations have a compelling obligation to help their less well off neighbors, in their own self-interest as well as for humanitarian reasons.

The fact that it is poverty which drives so many to ravage the land brings me to the second extreme: the attitude of those who would place ecology before humanity.

Life on this planet is an evolving ecosystem. Future generations of humans

may well view us with as much curiosity as we now view our more remote ancestors. Resisting change, whether man-induced or otherwise, is as futile as it can be harmful. Perhaps what we can do is guide change in a manner which, as much as possible, will better protect the long-run interests of humankind.

Yet there are some who would fight even the smallest disruption of the environment. They seem to forget that the history of the world has always been one of evolution and that adaptability is one of the wonders of nature.

It is true that the potential forces of potential man-generated destruction are now greater than ever. But more and more people are recognizing and taking into account the importance of the earth's biological diversity to future important breakthroughs in the biological sciences which will support sustainable growth. Those solely concerned with preservation for preservation's sake, however, run the risk of going to extremes which lose sight of the urgent economic good of people at large. And, once people's economic welfare is adversely impacted, their concern for their environment can only decrease. The situation is obviously self-defeating if a too-narrow focus on ecology creates economic deprivation which in turn forces people to generate yet more environmental damage.

Getting past these opposing extremes—of greed or necessity on the one hand, and of dogmatic ecological and environmental purity on the other—may require more definitive steps along the lines of those suggested in the recent World Commission's Report which calls for the real integration of environmental concerns and economic needs.

Most people today recognize that the two must be viewed as equal partners, but this has not always been so. Too often in the past, environmentalists have pursued causes they believed in passionately with a certain arrogance and self-righteousness which many times actually hurt their cause. In some cases, they became spoilers—adept at stopping economic progress, but offering few constructive alternatives and basing their position on lopsided reasoning.

By the same token, many major economic players have tended to view environmentalists as wooly-headed tree-huggers. Those who focus solely on economic growth tend to scoff at what they see as the excesses of the environmental movement. At the same time they often ignore legitimate early warning signs of basic threats to future survival, for they themselves may be partly responsible.

Neither of these extreme positions is constructive and both ignore the deep interrelationship between our economic and environmental well-being. But fortunately, I believe we are seeing progress on both sides.

The question is, what more can be done to promote cooperation between those concerned with protecting the environment and those dedicated to promoting economic growth? I have three suggestions:

First, I suggest that environmental concerns be made integral—not add-on—priorities wherever economic decisions are made. It is encouraging that the World Bank, which had in the past been lax in this regard, now is taking environmental issues more seriously. But a systematic approach to this problem

needs to be taken by all governments and all economic institutions in both the public and private sectors. There have been a number of interesting and constructive proposals along these lines, such as debt-equity swaps and the creation of a World Conservation Bank. I applaud these, but I also believe that the most far-reaching hope for significant progress is through concerted action by all our major institutions, economic and political.

Second, I believe that we should consider incorporating economic impact statements as an integral part of environmental impact statements. I am not suggesting more bureaucracy, but I am concerned that at present special interest groups are able to use environmental impact statements with great effectiveness to stop projects they do not like, but which have substantial economic and social importance. If economic considerations were examined concurrently with environmental impact, a more balanced result would be likely to emerge.

Third, and finally, I believe that we should look at new growth strategies for the developing nations which will help to alleviate the poverty which now makes the environment a second-class citizen.

Just last year, I was involved in an extensive study called "Toward Renewed Economic Growth in Latin America," which was jointly carried out by El Colegio de Mexico, the Fundacao Getalio Vargas and the Institute for International Economics. While the emphasis was on Latin America, I believe that many of the proposals that emerged from this study are valid more broadly.

Simply stated, this strategy has four parts—three for developing nations, and one for the developed world. The parts for the developing nations call for a more outward orientation with an emphasis on exports rather than import substitution. In addition, it calls for new efforts to induce savings and investment, and for a substantial reduction of the role of the state both in directing economic affairs and in the production of goods and services.

An underlying theme of the study is the promotion of greater entrepreneurship in the private sector and a stronger sense of ownership by people involved in the production process. It seems to me that, in addition to generating more economic growth, this sense of ownership will also foster more reliable protection of the environment.

If people do not feel a personal stake in their grazing land or farmland or forests or waters, it is doubtful that they will do much to protect them. Without a sense of ownership there is no incentive to preserve. Indeed, the opposite may be true. The natural tendency is just to leave matters to the state or to exploit resources as much as possible before someone else does.

On the other hand, a feeling of ownership, combined with appropriate technology and better education, can do miracles in terms of making people care about preserving their natural resources at the same time that they enjoy better standards of living. A farmer who is passing his land on to his children will think carefully before destroying it. Given greater knowledge and meaningful options, it is possible for more and more people to play constructive roles as guardians of global resources.

The developing world cannot, by itself, overcome economic stagnation and the resulting ecological myopia. The developed nations have a major role to play in providing markets as well as technical and financial assistance. In addition, there is a need for a combination of renewed economic growth, trade liberalization, cuts in budget deficits and real interest rates. The Third World needs substantial new funds from private sources and international agencies such as the World Bank.

These proposed strategies will be difficult for both the developing and the developed worlds to accept. Nevertheless, we must make every effort to adopt them, for I fear that the alternatives can only mean continued economic deterioration with consequent destruction of the environment.

We come now to a final point I would like to make. It is a point which was also stressed in the report of the World Commission on Environment and Development. This is that the environment should be everyone's concern and not just the province of a few, isolated specialists.

CONSERVATION AND SUSTAINABLE DEVELOPMENT: THE ROLE OF U.S. ASSISTANCE

Nyle C. Brady

The growing number of international and national meetings concerned with conservation issues attests to the global concerns for the protection of the earth's natural resources. I share this concern—personally as a scientist and officially as Senior Assistant for Science and Technology of the U.S. Agency for International Development (AID).

In terms of overall concepts and perceptions, there is a growing international consensus that:

—Environmental problems have no national boundaries;

—Human health depends on world environmental health;

—Environmental protection and economic development need not be in opposition, but can be mutually supportive;

—We must be concerned about our children's futures; and,

—If we are to win the conservation war, we must win the war on poverty.

Perhaps I can give another perspective to these concerns and the linkages between conservation and development, as an AID official concerned with science and technology; and, in addition, discuss the role my agency has played, and likely will play in the future, in the area of environment and natural resources.

First, it is important to understand the external political, social and intellectual context in which AID operates. As a scientist and administrator, new to government bureaucracy, I have been singularly impressed by the degree to which a bilateral donor such as AID must respond to influences external to the agency. The primary influence, of course, is and should be from the developing countries that we are supposed to help. As one of the most decentralized donor organizations, most of our program decisions are made by our 60-country missions in consultation with developing country counterparts.

Another external influence is the legislative branch and other executive agencies of the U.S. government. We are bound by bills passed by the Congress, which reflect differences of opinion among the branches that are ironed out by compromise during the legislative process.

The most complex of all these outside influences are the many non-governmental constituencies which support foreign assistance, each with very specific interests and ideas. They include the university community, the private voluntary organizations, commercial and business interests and non-governmental environmental and family-planning groups.

Their interest and support are critical but their views and interests can be conflicting in many areas such as agriculture, health and family planning. Common to them all, however, is the desire that their individual concerns receive equal treatment. Arriving at a fair balance among these important external interests can be a delicate and difficult task.

Second, it is useful to remember the historical context of U.S. foreign development assistance. The first "big project" phase (1949 to 1972) was patterned after the Marshall Plan for European recovery after World War II.

The emphasis was on short-term activities to support infrastructure construction and industry. Little or no attention was given to human resource development or institution problems. Environmental matters were largely ignored. The focus of the project was on rapid assessment of development needs, quick action on projected solutions and funding, withdrawal where appropriate, then movement on to the next project.

This approach was mutually agreed upon by the donor and recipient countries since the accepted perception of the road to success was to mimic the U.S. and other more developed countries. The underlying concept was that foreign aid should be both temporary and short term.

Though there were some notable successes, in most cases the results were, unfortunately, disappointing, primarily because the benefits of the investments did not reach the poor people who were most in need.

Since recognizing that support for industrial development as the sole engine to drive social and economic development was inappropriate, the next phase

(1973 to present) has been to focus development assistance on those who need it most—low-income citizens. Emphasis has been placed on agricultural improvement, rural development, better health and education and family planning. While the results have not been uniform, very significant progress has been made:

—The "green revolution" prevented the massive starvation predicted in the 1960s by the experts, notably in Asia and Latin America;

—Life expectancy has increased dramatically and infant and child mortality decreased, although it is still disgracefully high; and,

—The rate of population increase has been slowed significantly in some countries.

Unfortunately, environmental concerns and natural resource management were not given high priority.

The third phase, which is only now beginning, is emphasizing sustainable development as a primary goal. This does not require abandoning the fundamental focus on the needs of the people and the need for economic development. It does add a complementary concept that whatever we support must be sustainable over time by our developing country partners. It means that along with meeting the immediate human needs for food, fiber, health, energy and income, the equally important needs, particularly for children, of environmental quality, biological diversity and natural resource conservation must be attended to.

This new phase has been heavily influenced, as it should be, by private voluntary organizations. It has only begun and will likely last a long time.

AID has made significant progress relative to this third phase. In 1976, when the agency's environmental policy was adopted, it had three major objectives:

—To ensure the environmental soundness of all the projects we support;

—To help the developing countries with whom we work to build their institutional and scientific capacity to identify and solve their environmental and natural resource problems; and,

—To promote environmentally sound development by other donors.

To implement that policy, we conduct environmental assessments of projects that have the potential for negative impacts on the environment in our cooperating countries. We created a new Office of Forestry, Environment and Natural Resources and expanded our technical staff in these fields both in Washington and in our overseas missions. More importantly, we provide loan and grant funds to support programs that address environmental and natural resource management needs as identified by our host countries. These range from water-quality improvements to forest management and conservation. Our expenditure in this area in fiscal year 1987 was about $155 million.

We continue to refine our approaches to emerging international issues such as those on the agenda of this meeting. AID's concerns for conservation of biological resources led to our support for a U.S. Strategy Conference on Biological Diversity in 1981 in cooperation with the State Department, other U.S. federal agencies and the scientific community. One of the recommenda-

tions of that conference—the establishment of an Interagency Task Force on Biological Diversity—was translated by the U.S. Congress into an amendment to the Foreign Assistance Act of1983. The amendment called for AID to take the lead in preparing a U.S. Strategy for Conservation of Biological Diversity in Developing Countries. Following the preparation of the strategy, Congress passed new legislation in 1986 setting aside approximately $2.5 million of the fiscal year 1987 AID budget for specific conservation activities.

Some of the specific actions under way include:

1. Identification of priority countries, ecosystems and programs in each of the three geographic regions in which AID works.

2. Investment in improving the present methods of economic analysis that better measure the real costs of natural resources depletion and the economic benefits of maintaining ecosystems processes and conserving wildlands.

3. Expansion of research efforts to help us better understand and maintain biological diversity. Biological and physical science studies will be complemented by social science research to reveal and modify how human activity impacts on biological resources and their loss.

4. Intensified efforts to develop alternatives to unsustainable agricultural practices, such as slash-and-burn agriculture, and to incorporate the use of multipurpose tree species in all agricultural projects to reduce pressure on natural habitats.

5. Use of our experience to encourage other public and private donor organizations to invest in conservation. To enhance collaboration in this area we helped initiate and are providing support for a Consultative Group on Biological Diversity. In addition to AID, the initial members of this group are a number of the major U.S. private foundations that support work in both conservation and development.

We have also recently redefined the agency's approach to agriculture and rural development, incorporating three equally important goals:

—Increasing the incomes of the poor majority;

—Increasing the availability and consumption of food; and,

—Conserving the natural resource base.

We are working with groups outside the agency to see how this new focus can be carried out. We will need help from these and many others as we move forward in implementation.

EXAMPLES OF PROGRESS

There are some good examples that combine these concerns for improved incomes, food consumption and conservation of natural resources. One example is the Central Selva Resource Management Project begun in 1982 in the Palcazu Valley of the high jungle in Peru. The project is jointly funded by AID and the government of Peru at a total of $30 million over six years. Its purpose is to test a methodology to promote sustained productivity in the Palcazu Valley and to institutionalize capability within the country to plan and implement integrated

regional development. Covenants included in the project agreement required that the government of Peru designate a national park and a protected forest area in the watershed, and assign technical staff to the area. The project design was derived from an environmental and social assessment that analyzed land-use capability.

The assessment concluded that production forestry held the greatest potential for development, that previous plans for large resettlement of people to increase food production were not feasible and that major attention should be given to managing the area for existing inhabitants, many of whom were native peoples.

The project's goal is to develop sustainable production in the high jungle with systems less destructive than the traditional "exploit-and-move-on" methods. Major activities include agricultural development and integrated agro-silvi-pastoral livestock management, health and environmental sanitation, roads, communications, and two of particular interest: natural forest management for sustained yield and the establishment of protected areas.

The forest management plan is testing rotational, narrow clear-cuts based on new scientific knowledge about how plants recolonize cleared areas and the regeneration requirements of tropical forest canopy tree species. This technique will hopefully permit natural forest regeneration over 30-year cycles, and generate an adequate annual family income from 80-hectare holdings.

The park and forest reserve areas were selected because protection of upper watersheds helps maintain the economic returns from downstream production forestry and agriculture. They also provide a refuge for the unique flora and fauna of the area.

We hope that the Central Selva Project will demonstrate an ecologically sound and sustainable production methodology that, with adjustments, will apply to other high jungle areas in the Amazon as they are opened for development. However, it also raises the issue of what is the appropriate duration of projects that deal with environmental degradation and renewable natural resources.

The six-year time frame already appears too brief given the severity of the problems, the time required before returns on investments may be realized and the need to test new and sometimes risky technologies. Ten to twenty-year commitments may be necessary, requiring that governments and lending agencies rethink existing policies and approaches.

AID is now designing projects with longer time frames, which is a significant breakthrough and, in fact, is negotiating an extension of the Central Selva Project. Another example is a ten-year natural resources project for Panama which has four components: watershed management, natural forest management, private industrial plantations and farm woodlots. The project rationale is based on the need to protect the economic values of existing agriculture and commercial investments, including the Panama Canal, to maintain electricity and water supply to major urban areas, to reduce dependence on wood imports and to enhance employment.

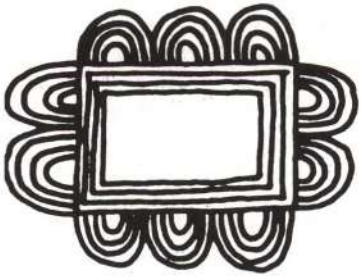
FUTURE CONCERNS

I strongly believe that economic development and concern for environmental and natural resources provide the twin engines for sustainable improvements in the low-income countries of the world.

There is a growing recognition in developing and donor nations alike that economic development and the maintenance of environmental quality and biological diversity are not only compatible but can be mutually supportive. It is no longer viable to think in terms of economic development versus environmental quality. The two must work hand in hand for the betterment of human life around the world.

While governments must continue to be major players in sustainable development activities, they must have help from non-governmental organizations (NGOs) and private enterprise. NGOs from both the Third World and donor nations must help in conceptualizing what is needed and in planning its implementation. Private efforts will be the backbone of sustainable development implementation. Countries with successful economic growth have done so under the leadership and initiative of individuals and private enterprise. The second wave of countries accelerating their development has provided greater opportunity for individual effort. Their example could be followed.

While more financial resources are essential, another element must be considered. It is time for those concerned with the environment and natural resources to do a better job of coordination than has been evident in the past. This includes coordination among donors and coordination by the environmental community. The international agricultural research effort could be used as a model. It provides coordination without homogenization.



TOWARD SUSTAINABLE GROWTH: A NEW APPROACH TO WORLD ENVIRONMENTAL PROTECTION

William D. Ruckleshaus

If I had to sum up the recently released report of the World Commission on Environment and Development in a single phrase, it would be this:

That the survival of this planet as a decent home for all who share it depends on us making profound changes in the way we do business.

I have chosen the word business deliberately because few things affect the environment more directly than the way we extract material from nature, add value to it by industrial processes and bring it to market. In America we refer to these processes as "doing business."

Since what I have to say derives largely from the World Commission Report and from my personal experiences as a member of that commission, let me begin by setting out why I believe its findings demand the closest attention from the world's economic and political leaders, whatever their nation's stage of development or their economic or political system.

First, the World Commission has made a clear finding that for most of the developing world, mindless continuation of current practices will lead to descending spiral environmental degradation, increased poverty, desperate remedies inflicting further destruction of irreplaceable environmental assets, political disorder and even social chaos. The statistics on what conventional "development" has wrought in terms of desertification, soil erosion, impoverishment of rural people and the loss of tropical forests are by now depressingly familiar.

Second, the continued prosperity of the developed world is dependent on the accelerated prosperity of the developing nations in an environmentally responsible manner. The developed world is increasingly dependent on the developing countries for markets, and this dependency will increase. Even now, the developing nations represent a larger market for U.S. goods and services than all the developed nations combined, with the exception of Canada. Such markets will vanish if the developing economies do not resume their expansion. Most cannot resume if the present environmental warnings are ignored.

Think of this: We in America have always viewed environmental degradation as an unwanted side effect of industrialization. Today, in the developing world, just the opposite is true. Environmental degradation equals absence of development.

Third, it follows from this that economic development and environmental protection are complementary rather than opposing goals. They are two sides of the same coin. This, I believe, is the central—and jarring—finding of the World Commission's report. Nations that remain poor will not protect their environment; nations that do not protect their environment will either remain poor or gain poverty.

Finally, the World Commission proposes sustainable development as a new model for economic growth. Sustainable development means increasing prosperity without the destruction of the environment from which all prosperity ultimately derives. Twenty years ago, when the roots of the present environmental movement were being formed, such an idea would not have been welcomed or understood. Environmental protection was seen by most business and developmental interests as an overblown stumbling block. Most environmental interests saw development as the cause of environmental degradation. Many preached that the world economy had reached its limit and that redistributive policies leading to a static, universal human leavening were the only moral choice.

The commission saw both these views now as shortsighted. Our view was that environmental protection, far from hindering economic progress, is its irreplaceable partner; it is growth, not poverty, that will save the environment.

It is for the economic powers of the world to lead the way in the creation of this growth. Success in fighting environmental degradation depends on reinvigoration of the world economy, a task that lies largely within the power of the developed nations, their firms, their governments, their financial and human resources and the multilateral lending institutions they fund and control.

The developed nations have a special responsibility for another reason. Perhaps the greatest luxury of a certain level of prosperity is the freedom to plan beyond the immediate future. We can see, if we will, that unless the world economy moves in the direction of sustainable development, all nations will eventually be paupers, living in a tumbledown shack of a planet.

In recent times, the poorer nations have not had that luxury. At a certain level of desperation, tomorrow is swallowed up by the mouth of today. If you are worrying constantly about what your child will eat, it is impossible to be much concerned about what your grandchild will breathe. So we see nations beginning to act like starving people, eating their seed corn, boiling it on the fires of the last tree. The developed nations have too often contributed to such situations, without any excuse for doing so. Ravaging the environment in exchange for marginal increases in the bottom line was never an ethical choice: we now see it is stupid as well, when considered in anything but the shortest possible view.

Let me make two final points about the World Commission findings. The first is that it is not a prediction of doom. It is the most hopeful major environmental document to be published in the past twenty years. The trends which the commission notes are a warning but, as René Dubois has said, they are not our inevitable destiny. There is not much time to change, but there is time.

The other point concerns the practicality of instituting economic changes

on the scale required to make sustainable development a reality. We should understand that these changes, while possible through execution, are by no means painless. Economic policy and strategies for promoting growth in both the developed and developing nations are products of power balances among various interests. Some of the interests adversely affected will surely have their oxen gored by the changes recommended by the World Commission and will resist them.

We dare not be put off by such resistance. The world requires an economic order that will realistically promise sustainable development and hence a livable future. Indeed, I detect hopeful signs that significant changes are already under way. I would like to touch on some of these in the context of the recommendations of the World Commission report.

First, there have been significant changes in the attitudes of many corporate leaders in the developed world toward environmental concerns. In the United States over the past 15 years, Americans have generally accepted that environmental protection is a necessary cost of doing business. Transnational corporations are a major influence on the environment throughout the developing world, and a major source of both pollution and the diffusion of environmentally sound technologies. The proportion of money flowing into developing countries from private sources is much greater than the total of official development aid. Recognizing the importance of this investment, several major corporations from a number of developed countries have formed the fledgling International Environmental Bureau to help developing countries plan growth in an environmentally sound fashion. The device of swapping debt for the commitment to protect vital natural areas, pioneered by Citicorp and Bolivia, is a more dramatic example of this new concern.

These are important first steps, but much more needs to be done. Increasing cooperation between government and industry is essential if we are going to generate real strategies for sustainable development. This can be accomplished directly by the establishment of joint advisory councils in individual nations, or indirectly through the use of regional or non-governmental organizations.

Out of such cooperation should come environmental goals, regulations, incentives and codes of private sector behavior that are workable, international and consistent. Nor should industry remain a merely passive compiler. There is much it can do affirmatively, even within the constraints of completion. Hopeful examples of this are the formation in the United States of Clean Sites Incorporated, an industry-funded organization devoted to cleaning hazardous waste sites, and the Health Effects Institute, which receives support from both government and the motor vehicle industry, and which functions as an authoritative source of information on the health impact of auto emissions.

Extending this concept to sustainable development, the World Commission recommends:

- That all industrial enterprises work to establish company- and industry-wide policies governing resource and environmental management, including man-

agement and worker training to incorporate cleaner technologies and environmental planning into work patterns;

- That industries using hazardous materials ensure that information on the risks involved be conveyed, not only to government agencies in the host nations, but also to the people subject to such risks;
- That plants be operated according to the highest standards of safety; and,
- That transnational firms institute environmental and safety audits of their operations in host countries and measure the findings not against the prevailing local standards, but against those in effect in developed nations.

These and similar measures will help to move transnational firms into a position of environmental leadership commensurate with their enormous technical skills and economic strength.

Of course, international agencies also have a major role in the effort toward sustainable development. They have come to realize that in the past, their development aid has often encouraged quick yields of exportable commodities at a terrible cost in environmental degradation and has resulted in the actual impoverishment of large numbers of people—in short, unsustainable development. This is changing, as evidenced by new policy emphasis at the World Bank.

Recently we have seen this reformed policy in action in relation to international funding of roads and railroads in the Brazilian Amazon. The Inter-American Bank has threatened cancellation of this funding because the roads are leading to wholesale destruction of rain forests for cattle ranching and the production of pig iron, using charcoal derived from the forest. This situation is worth mentioning because it is highly symbolic. There is something seriously flawed with an international development assistance program that encourages the destruction of irreplaceable tropical forest to produce a commodity pig iron of which the world already possesses a vast and growing overcapacity.

Beyond this, the World Commission report recommends that a larger proportion of total development assistance go to investments needed to enhance the environment, such as reforestation, fuelwood production, soil conservation, rehabilitation of irrigation projects, agroforestry and small-scale agriculture. Sustainability considerations must be diffused throughout the lending community, starting with the World Bank and the International Monetary Fund, particularly in regard to commodity assistance and other policy-oriented lending. In the past, such lending has served too often to reduce, rather than enhance, the possibilities for sustainable development.

The mandates of international trade organizations, principally the General Agreement on Tariffs and Trade and the United Nations Conference on Trade and Development, should be modified to reflect concern for the impacts of trading patterns on the environment.

Other international institutions should move to recast their research and planning activities in order to strengthen the information base that will make development sustainable. A recent example of this is the Tropical Forestry

Action Plan produced by a cooperative effort of the Food and Agriculture Organization, the World Bank, the World Resources Institute and the UN Development Programme. The plan offers the opportunity for ending the current state of alarm over the destruction of these forests. Its implementation would lead to restored productivity, sustainable use of forest resources, improved food security through better land use, increased supplies of the fuelwood upon which fully half the world's population depends, increased income from locally manufactured products and conservation of endangered species and natural ecosystems. The plan's cost of $5 billion over five years is large in relation to what has been spent on such projects in the past, but it is tiny when compared to what has been spent in recent years on environmentally degrading projects in tropical forest regions.

But perhaps the most important role in creating the conditions for sustainable development will be played by governments, both in the developed and the developing world. Here is where I fear the most difficult problems will lie. History shows how unusual it is for those in charge of governments to take actions that will have effect only over the long term, when they themselves are out of office. It is extremely unusual when the immediate beneficiaries of such actions are people in other lands. It is virtually unheard of when such actions have short-term negative effects on domestic political interests. This will always be true so long as governments are run by human beings.

There is reason to hope that even governments can learn from experience. At the famous Stockholm conference on the environment in 1972, invited delegates of 29 sub-Saharan nations stood and roundly denounced environmentalism as a plot to check development in what we then called the Third World. The dreadful results of 15 years of development projects that have often ignored environmental realities have in many nations had a pronounced educational effect. Recently, Julius Nyerere, the founding president of Tanzania and still one of the most influential of black African leaders, stated, "Environmental concerns and development have to be linked if the latter is to be real and permanent." That would have been heresy at the Stockholm luncheon.

Examples of what happens when there is no such linkage are all too common. Perhaps the most striking is what happened in Costa Rica. I do not mean to pick on Costa Rica; I could have used any number of examples, including many right here at home. I choose it because this nation had and retains so many advantages that so many other developing nations still lack: stable, democratic form of government, enlightened social legislation, a modern infrastructure and a bountiful land and climate. During the 1970s Costa Rica, in common with other Latin American countries, borrowed heavily in international markets. For a variety of reasons these loans did not suffice to establish a viable industrial sector, and so pressure was increased on export agriculture as the only way to earn sufficient foreign exchange to service the loans. Now the nation entered what the World Resources Institute has called "dual debt," the most egregious example of which is in cattle ranching. Large producers of export commodities were subsidized by cheap audit and guaranteed prices. This encouraged them to

borrow again, this time against the land itself, clearing forests and bringing marginal land into production. This additional short-term production increase led to yet more borrowing. But the poorer soils supported fewer cattle as the years and the cycle went on, until now, although beef production represents only 6 to 8 percent of Gross Domestic Product, cattle ranching soaks up one-third of all agricultural credit, cattle occupy half the agricultural land, soil erosion has greatly increased, water resources have been wasted, the forestry industry has been decimated and large numbers of people have been driven from the land into the cities and into poverty and unemployment. Costa Rica now has the highest per capita debt in Latin America and is losing forests at the fastest rate in the hemisphere. As I said, my point is not to single out Costa Rica.

If there is a moral to this sad story, it is this: In planning any economic or development policy, developing nations must make sustainability the primary consideration. It can't be secondary, or ancillary, or "nice to have," or something for an understaffed environmental agency to worry about at a later date. If sustainability is not primary, then any natural, political or structural advantage the nation has will be nullified, sooner or later.

How each nation makes the transition to sustainable development will vary with its economic and political institutions and its culture. In the United States, we have created an elaborate and expensive legalistic system based on complex environmental reviews and command and control regulation. This is not necessarily the correct model for the developing world; in fact, I would tend to doubt it, on the basis of my own experience in trying to get it to work properly. Japan has done wonders with its air quality using a quite different system. The point is that developing nations must strive to avoid the development errors that now cost the developed nations tens of billions of dollars each year to fix. If they can afford development, they can afford sustainable development. As we have learned, environmental protection after the fact is too damned expensive.

The national governments of the developed world also have a responsibility here. Resolution of the debt crisis and a resumption of global growth is essential: national programs to help this happen are not in any sense charitable, but rather hard-headed investment in our common future.

Beyond this, national economic policies must be adjusted to encourage sustainable development in the developing world. As I noted earlier, this will cause short-term dislocations in some sectors of some national economies, and governments must prepare to respond to these.

Continued subsidies to agricultural commodities are a major example. Agricultural policies built on shortsighted political responses are becoming a critical economic and environmental problem throughout the developed world. Not only do they divert resources from more productive ends, like investment in sustainable development, but the resultant surpluses depress farming enterprise throughout the developing world. This crisis is now high on the political agendas of the United States, the European community and Japan. It remains to be seen whether these nations will marshall the leadership and wisdom to reform

agricultural policy in the face of seductive short-term political temptation.

Protectionism and restrictions on the flow of capital are problems of the same type. The developing world cannot grow in the way it needs to grow, absent from the free flow of capital. Yet trade barriers are rising in the developed world, largely in response to the development success enjoyed by a small group of nations, mostly in east Asia. Should these barriers hold or continue to rise, there is little hope for the kind of development required to preserve and restore the global environment. History shows again and again that such policies impoverish the protecting nations along with those they would protect us against. Our response to global economic interdependence must not be to erect barriers but to accept the challenge that interdependence offers us and lead the world toward an environmentally sound prosperity.

Developed world governments are often moved to action by the efforts of non-governmental organizations. The environmental organizations in the developed nations have, I think, an important role to play. They must become more international and developmental in outlook, so that they can place their ethical force and energy behind the ideas proposed in the world where every day 25,000 people die from easily preventable waterborne diseases. And yet we continue to argue in America about even smaller increments of pollution abatement with diminishing health benefits. This is like putting another coat of white paint on your house while your neighbor's house goes up in flames. None of the environmental values we cherish in the developed world will long survive if sustainable development does not become a reality.

A word should be said here about the notion of pollution havens, since it involves governmental policies in both developed and developing countries. By one estimate in 1980, the industries of developing countries exporting to OECD members would have incurred direct and indirect pollution control costs of over $14 billion had they been required to meet the pollution control standards then prevailing in the United States. In one sense, the developing nations were extracting a subsidy from the environment in order to increase competitiveness.

This is a delicate issue. The developing countries may claim that they cannot yet afford the higher environmental standards, or that our standards are unnecessarily strict. It is probably inappropriate for the developed nations to demand that developing nations simply follow their environmental lead. Yet when the environmental subsidy comes not out of a particular area within national borders nor out of the health of the citizens of one country, but affects the global commons, then it must become the concern of all nations. Working out how the various national policies, developed and developing, affect the common interest is a task we have barely started. Both developed and developing nations must work harder on this issue if the destructive experience of the now developed world is not to be repeated in every corner of the globe, with possibly irreversible effects on the world environment.

Sustainable development is a difficult lesson. How difficult may be seen in the problems we have had in applying one of its minor corollaries, the concept

of sustainable yield in the fisheries industry. Across the world, once productive fisheries have been destroyed and fisherman have themselves gone under because of failure to grasp the simple lesson that you can't take fish year in and year out faster than they can reproduce themselves.

Will sustainable development require a miracle, then? Perhaps, but we have seen miracles enough in our time. Millions of people now alive recall Hamburg as a field of stones and Tokyo as an ash pit. India now not only feeds its millions, but exports food and will survive the current monsoon failure without the mass starvation such events have occasioned so often in recorded history. Much of the developed world recognized the warnings of Stockholm and acted on them, and the economic disaster many predicted did not occur.

Enormous changes are afoot, and we must develop economic and political systems capable of coping with them, including especially the ability to succor those injured by the changes incident to a move toward sustainable development. The ecological and human consequences of not doing so are, I believe, intolerable.

And there is another consequence, yet more grim. I have not mentioned peace and security, although that is an important focus of the World Commission report. In the past 20 years the developing world has endured over a hundred armed conflicts, with a total of 11 million dead. The world now spends a trillion dollars annually on arms and not a fraction of that to avoid one of the chief causes of the use of those dreadful weapons, namely resource depletion and the subsequent uprooting and devastation of vast numbers of people.

Former Secretary of State Dean Rusk has written, "One of the oldest causes of war in the history of the human race, the pressure of people upon resources, is being revived in a world in which thousands of megatons are lying around in the hands of frail human beings." Surely, sustainable development is about relieving that pressure for ourselves, our children and our *Only One Earth*.

Drawing by J. Wolf

ECONOMICS AND INTERNATIONAL AID— A DEVELOPING WORLD PERSPECTIVE

Emil Salim

My country, Indonesia, is in the World Bank category, "lower middle-income economies." We have an average income of U.S. $530 per person, as compared to around $17,000 U.S. dollars per person in the United States. We have a total population of 172 million people and, in spite of the fact that successful family planning reduced the population growth from 2.3 percent in 1970 to 2 percent in 1980, we are still experiencing a rapid growth in population. We expect, by the year 2000, to have a population of 216 million, or an additional 43 million people in the next 13 years. This is equal to the size of Thailand's population today.

What does this mean? It means that we have to change our economic structure from an economy depending on land-based activities toward industrialization and surface industries. As a low-income country with high population growth, the pressure is large on the total forest. Out of 193 million hectares of total land area, we have approximately 143 million hectares of forest. It is planned that out of the 143 million ha, we can maintain 113 million ha as a permanent forest. But for this we need development.

Currently, we are assisted by the World Bank, which is working together with us on a development plan incorporating environmental considerations and sustainable development for the years 1989 through 1994. In this effort we are encountering certain serious problems, such as how to give substance to the concept of sustainable development.

One of the major issues is financing conservation and sustainable development. In brief, the issues that we are confronting involve giving substance to the concept of sustainable development—issues such as how to raise the interest of the aid-giving countries to finance environmental programs which have a low internal rate of return (such as financing buffer-zone development around a tropical forest or buffer zones around the national parks) and a very low rate of return on investment; or programs such as land rehabilitation and reforestation, which have a low foreign exchange component and a high local currency component. The trends in aid-giving countries are that foreign aid is to be used to finance the foreign exchange component, and preferably on a donor country's financial base. You receive aid, but it must be spent in the aid-giving donor

country. If that is the case, how do you finance land rehabilitation and reforestation, which have a high local currency component?

Second, there is aid fatigue now. Everybody is tired of aid. One gets fed up with aid. So how to raise the total value of aid-flow if you do not only want sustainable development, but want to have it with environmental considerations? Therefore, larger flow is required at a time when the supply of aid is diminishing. Aid for family planning is declining. Aid to the United Nations Environment Program for 1986-1987 is declining. Total aid to the IDA funds (the International Development Assistance Funds of the World Bank) is not forthcoming. So the total flow is declining while, on the other hand, the need is increasing.

Third, how to ensure an integrated approach to development between the numerous United Nations special agencies such as the FAO for agriculture, UNITO for industries, WHO for health, and so on. While in *Our Common Future* the basic notion of sustainable development is an holistic approach, how can you assure an holistic approach if all the special agencies are working separately? How can UNEP coordinate this?

Finally, how will the environmental dimension be treated in the covenants of aid documents? If you have an aid agreement, you must sign a document. There are conditions. How is the environment to be treated? Will it be another conditionality that if you don't do this and that, then aid will not be forthcoming? If that is the case, it will put an additional burden on the developing countries.

These are, in brief, the major issues that we in Indonesia, and I trust also in the other developing countries, are confronted with when wanting to obtain financing for sustainable development programs.

Drawing by Gaston Phoebus, ca. 1390

CULTURE, MAN *and the* ENVIRONMENT

"I heard today that economic growth is a necessity and conservation is a matter of importance. We disagree. Conservation is life and economic growth is a matter of interpretation."

—Chief Oren Lyons,
Onondaga Nation
Spokesman for the
Traditional Elders Circle

CULTURE AND SOCIETY

THE PERSPECTIVE OF TRADITIONAL AND NATIVE PEOPLE

Oren R. Lyons (Jo Aqguisho)

Neyawenhha Scano—Thank you for being well.

Greetings from the traditional elder circle, the chiefs, clan mothers, faithkeepers, men, women and children, even those on the cradle boards, we send greetings to you.

My relations:

The World Wide Conservation of Wilderness is an important consideration. I shall do my best to present the perspective of traditional people, but I am sure that there will be many things left unsaid and not presented. I apologize for this and admit my ignorance of the cultures and wisdom of the indigenous people and nations unknown to me through this hemisphere and the world. One thing that I have been finding out is that the indigenous nations throughout the world do understand the natural law and have fashioned our societies to support and adhere to this great spiritual law.

I am often asked to speak on behalf of native peoples in North America because I am educated in my brother's culture and society. I understand his language better than I understand my own. Because of that I am able to communicate with you our collective thoughts. I have been instructed on what to say and it stays with me.

It is important for you to understand that our societies often choose representatives to convey the thoughts of the people. The thoughts conveyed may be the collective position of the people of the Onondaga Nation, the

Onondaga Council of Chiefs, the Grand Council of Chiefs of the Haudenosaunee or the traditional elders circle of North America, the good minds.

It is not my thoughts nor my wisdom that you read, but the collective thoughts and wisdom of the indigenous peoples who have always been here in these lands from time immemorial. Their knowledge is profound and comes from living in one place for untold generations. It comes from watching the sun rise in the east and set in the west from the same place over great sections of time. We are as familiar with the lands, rivers and great seas that surround us as we are with the faces of our mothers. Indeed we call the earth "Etenoha," our mother from whence all life springs.

My relations: So then let us begin:

We will start with the word wilderness, derived from the word wild. For us there is no word for wild, it is not in our vocabulary. The closest we come to that is free; so then we speak of freedom in the natural order of things with the inherent rules and obligations of freedom. Respect and recognition of the sovereignty of the individuals, whether they be human beings, the animal nations or the living forests.

For us our lands did not become wild until our brothers from across the great Eastern sea arrived upon our shores, and then our lands became wild and untamed—even called the Wild West. Previous to that, this continent we called the Great Turtle Island was a land of peace and plenty, so we do not perceive our habitat as wild but as a place of great security and peace, full of life.

My relations: Listen to what we say:

Our grandfathers spoke of the crystal clear waters of the springs, streams, rivers and lakes and great inland seas. They spoke of the fresh pure waters. The first law of life: water.

They spoke of ancient trees, grandfathers of another age, trees so huge it took six men to circle their trunks.

They spoke of forest so vast, leaves so thick that sunlight barely found its way to the forest floors, and a squirrel could travel from the great eastern sea to the Mississippi River without touching the ground.

They spoke of flowers and medicines that grew in profusion along with the fruits, nuts and berries that fed not only the human families but also the animal nations that abounded and prospered in these vast lands.

They spoke of fish so abundant that in spawning season, the streams and rivers were so full you could run on their backs.

They spoke of the passenger pigeons so plentiful their roosting places were stripped of limbs, their combined weight breaking those limbs, so plentiful they darkened the sky for hours as they migrated north and south.

They spoke of the vast herds of game, deer, elk and massive herds of buffalo that roamed the entire continent, powerful and endless.

But they did end, and so we received our first lesson.

My relations: listen as we continue:

The lesson we learned was that man wanted to dominate, and what he

couldn't dominate he destroyed; that mankind was capable of destroying life, both the natural world life and his own. Our people were so closely aligned and intertwined with the order of the natural world that we suffered the same fate as the trees and the wolves, our spiritual relatives.

It taught us that mankind could be motivated to exploit the natural resources and the environments that these resources provided, to the point of total depletion and extinction of the animal and fish life.

It illustrated to us that there were people who were ignorant of the natural law, or who chose to ignore it. It caused our people to gather together in alarm and hold to our bosoms the principles of the great natural law and to protect our ceremonies that celebrated these principles and ensured the existence of the generations to come.

My relations: The natural law as we understand it is the ultimate authority upon these lands and waters. It is the prevailing law of life and the order of life upon this earth we call our Mother.

It is the law the Creator put here, set down here deliberately, firmly and with finality to govern all life in this creation.

This is the way we understand it. The Great Creator planted life upon this earth. He planted all of the nations of life from the grasses to the trees, from the insects to the elephants, from the tiniest life in the waters to the great whales in the seas.

He planted the families of mankind, in the four great sacred colors of black, white, red and yellow.

He gave instructions to these great nations of life, from the grasses to the whales, and they continue to follow these original instructions up to this very moment. To the best of their abilities they carry out these duties—they live in a state of grace. They do no wrong.

For us, the human beings, he gave additional responsibilities. He gave us hands to work with, he gave us intellect and the power of reason, he gave us options to choose our paths to do what is right or to do what is wrong. He gave us the foreknowledge of death and he gave us the insight to life after death. These are responsibilities more than gifts, and he gave each of us a mission in this life that is ours alone. These are responsibilities to be cherished and shared for the benefit of all life.

My relations: This is what we believe: Since you asked, we shall continue:

We are sharing this with you so that you may understand us better. These are our cosmologies. Your stories may be different, but we believe that we all received the same instructions in the beginning.

The natural law is a spiritual law. Its powers are both light and dark. We are blessed and we prosper if we live by the law. It is dark, terrible and merciless if we transgress the law. There is no discussion with the law, there is only understanding and compliance. Its tenets are simple.

A respect for all life, for all life is equal.

Thanksgiving ceremonies for the special forces of nature.

A Thanksgiving ceremony for the thundering Grandfathers who water the earth and the people who freshen the springs, streams, lakes and rivers.

A Thanksgiving ceremony for the four winds who bring the seasons and sow the seeds of life.

A Thanksgiving ceremony for the corn, beans and squash that sustain our lives and give strength to our bodies.

A Thanksgiving ceremony to our Grandmother, the moon, who raises and lowers the tides of the great salt seas, who gives us light at night and who marks the cycles of the female life and the seasons.

A Thanksgiving ceremony for our mighty Uncle the Sun, who unites with our Mother the Earth to bring forth life in all our seasons; who brings us light each day as we wait in the morning to greet him.

A Thanksgiving to those spiritual beings assigned to help the human beings carry out our duties.

A Thanksgiving ceremony to the Great Creator, the master of all life, for the creation and all that we have been given to enjoy, and to protect so that seven generations from this day our children will enjoy the same things that we have now.

Listen to the howl of our Spiritual Brother the Wolf, for how it goes with him, so it goes for the natural world.

My relations: So now we will continue:

The World Wilderness Congress gathers people from the four directions of the earth to report on how it is where we come from. This news is heavy and there seems to be a determined effort to destroy life on this planet. How did this come about and what are some of the problems facing us and the natural world?

What is the relationship between a fast-food hamburger and rain forests in Central and South America?

We as consumers should know, but we don't. And more to the point, even if we did know these connections and understand them, it is very questionable that we would give up the convenience of fast foods for the long-term process of conserving the wilderness and saving our environment.

The discussion then revolves around the values of the societies responsible for the attitudes of their people. What are the societies teaching their children?

Rain forests are cut down for timber and to clear the lands for farming and ranching. Ranching lands are seeded for cattle grazing, a cash crop. The local people do not eat the meat. It is often shipped north to become hamburgers. The people give up subsistence farming for wages and the land use is changed. Cheap labor on that end, more profit on this end. At the same time the manufacture of Styrofoam releases chemicals into the air that affect the ozone layer, the thin lifesaving protection of life on earth.

The rain forests are the lungs of the earth. Trees recycle carbon monoxide back into oxygen, clean air that all life breathes in common, thus continuing the life-giving elements and maintaining the constant atmospheres and temperatures around the earth. If we continue to cut these trees at the present rate, we

will have cleared a space as large as India within 30 years. The natural law is simple in this case: we will suffer in exact ratio to our transgressions; the damage done may be permanent in mankind's existence.

My relations: We shall continue:

The scenario is the same in Central and South America—first the timber companies come to clear the great forests and lands are used for cash crops. These crops need help to grow because the cleared lands are fragile, so fertilizers are introduced, and as the cash crops grow, insects invade and insecticides are introduced. These chemicals cost money, so soon the farmer is paying more for chemicals that his cash crops can be sold for, and he finds himself working for the chemical companies. Soon he gives up and abandons the land as it turns to dust and as the timber companies march into virgin rain forests, he follows to continue the cycles. This process is called progress and sometimes economic development.

The natural law is clear in this case: If you destroy the process of the life cycles of the rainforests, which affect climate around the world, then you will affect life as we now know it. The balance is delicate. The Mayans farmed these lands for centuries by working with this balance and they prospered. They are called people of the corn, and they lived in the jungles of these huge rain forests in harmony. They lived with the law in respect and understanding and they prospered.

There are great dams being built in these same areas and they have caused the rivers to cease their annual overflowing to bring silt and fertility to the lands that they covered. The lands lose their fertility and life suffers. We understand that the World Bank, which most often financially supported these projects, is now rethinking its policies, and I for one am grateful. The natural law is clear in this case: damage done quickly takes a long time to repair or renew. Thus, we may cut a tree with a chain saw in 10 minutes, but it will take 100 years for that tree to grow back. So who suffers? Our children. We are profiting at their expense. We are deliberately changing our life in the future and we must question our motivations.

The great seas are the same as the earth.

Man has lived off the abundance of the sea from time immemorial. Its great resources have sustained life and songs of joy and contentment have lifted our hearts up to this time. The energy it produces has galvanized civilizations and cultures throughout the world. But we, even now, endanger our lives by imprudent exploitation without regard to the laws of nature, and again we will suffer the consequences.

My relations: You have asked us what we think and so we will continue:

The herring is gone from the North Sea; it is gone from the diet of the people, the result of overfishing. How did this happen? It happened because we either did not understand the natural law or we deliberately chose to ignore it. We could say that technology caused the demise of the great schools of herring, but technology is a tool. Technology doesn't think, ponder or reason. That is the

province of mankind. So we must agree that the destruction of the herring was a conscious decision of mankind. What then is the motivation? The answer is simple: profit. Profit at our expense, for we are all deprived, including the fish life that also sustained itself on this once-great natural resource. Technology unleashed our greed. There were many nations involved in this great kill; they fished in competition and rivalry. They developed fishing nets that allowed larger and larger catches. The great seine nets were the final blow to the herring and coupled with the giant trawlers now prowling the seas they were able to catch in one day what previously took a month of fishing. So it is not technology that is to blame, it is the attitude of the fishermen. The results are the same; we have lost a great resource. It is the law that we suffer.

Brothers: There are many examples of mankind's folly and I use the word "man" advisedly because Western thinking, as we see it, has exploited the women as well. Men have excluded women from decision making, and thus flawed the partnership that is the natural law. Male and female are fundamental to life, partners in work to be done. By excluding the female, mankind has again denied a resource of compassion and understanding that balances the competitive nature of the males. We as men should not fear our mates; we should listen to their counsel. They may be the last reservoir of life. They are just now beginning to fight for life. Mankind should stop and listen to their song. As we plunge ahead to build empires and race for supremacy we should stop and listen to their song of life. For without the female there is no life.

My relations: We come to the close of this short discussion.

Do not take offense as we present the examples of what we consider flawed thinking. The examples abound.

Acid rain has already killed half the forests of Germany. Acid rain is killing life in the rivers, streams and lakes of northeastern America. It is killing the chief of the trees, the maple, as our prophecies foretold.

Great famines are sweeping the earth, particularly in Africa, where the natural law is exacting the price of transgressions against it, and life suffers without relief.

Water is contaminated at the expense of our children. Toxic waste dumps are time bombs of death as they slowly work their way into the freshwater veins of our lands.

The Indian nations of North America have been particular victims to uranium mining, and toxic piles of waste tailings have contaminated the people, aborting life in pregnant mothers and causing defects upon our children who are born in these areas.

How can we discuss the economic problems of wilderness and life without talking about the monster most responsible for the problems of the earth today? And that is the gigantic military complexes of the two most powerful nation-states in the world. Soldiers outnumber teachers and doctors by wide margins. And row upon row of deadly bombs, weapons and aircraft wait for the moment of global war. It is hypocritical for countries to profess the cause of peace when

their economies are based upon the sale of military hardware. Something is wrong when arms to developing nations outnumber economic aid three to one.

We are seeing our prophecies come to be, one by one. Our gardens in the Mohawk Nation Territories are stunted and refusing to grow from this dark cloud of pollution that daily rains down upon us. We were told that this would happen, and so it has.

Ninety years ago there were 13 cities with a population of over one million. Today there are 200 cities with one million, with Mexico City in the forefront with 18 million, and we know the problems of that city.

Respect should be given to those indigenous nations who still carry on their ceremonies; following the ancient laws of nature with songs and ceremonies.

We cannot give up. We must follow the spiritual law set down for us so long ago. We are not defeated—if we do not allow ourselves to be manipulated like yo-yos on a string by cosmetic politicians whose interests are not for the natural world or the people.

I have heard that economic growth is a necessity and conservation is a consideration of importance. We disagree. Conservation is life and economic growth is a matter of interpretation.

So, my friends and colleagues, at this time in history we have a task that we cannot leave to our children. We have a choice that takes courage, fortitude and a will inspired by the understanding of the great spiritual law of our Mother this Earth. Take heed to the word of our Grandfathers who instructed us to:

"Take care how you place your moccasins upon the earth, step with care, for the faces of the future generations are looking up from earth waiting their turn for life."

So the decision is simple. Obey the natural law, or perish.

Dah Nay To

THE ZULU TRADITION

Magqubu Ntombela

Editor's note—Eighty-seven-year-old Magqubu Ntombela is an elder of the Zulu people, a living legend of history and the African bush. His father fought in the Zulu War of 1879 against the British at Isandhlawana. His grandfather served the great Zulu king, Shaka and his great-grandfather served Chief Senzangakona. Although Magqubu cannot read or write, his knowledge of history is exact and

unfaltering. He remembers everything passed down through the generations, father to son.

Magqubu lives in a thatched cottage, in his kraal, at Machibini, near the entrance to the Umfolozi Game Reserve in Natal, South Africa. He lives with his two wives, many children, grandchildren, a herd of cattle, goats, chickens and sheep.

He learned hunting, tracking and other wilderness skills early in life—like all of his Zulu contemporaries at that time. Tracking skills were required to find lost goats and to hunt and trap for food. White rhino, black rhino, lion, leopard, cheetah, kudu, impala, reedbuck, crocodile and other animals were all part of his daily life.

At age 14, Magqubu was an accomplished hunter and tracker and a guide to hunters who came to shoot in the crown lands adjoining Uluhluwe and Umfolozi Game Reserves. At age 16 he was employed as a laborer by Vaughn-Kirby, the first Game Conservator of Zululand. Magqubu worked for over 60 years as a Game Guard, continuing to study and protect the wilderness resources of his native land.

Magqubu has been involved with the Wilderness Leadership School since its inception. The World Wilderness Congress was originally his inspiration, when he told Ian Player that conservation needed an "indabakulu," or a Great Council. He is a natural teacher and is a favorite leader on wilderness trails. Despite his age, he is always ready to go on the trail, to share his knowledge and understanding, and to provide people with his unique perspective on the need for wilderness and conservation.

The following is a mere glimpse into a rich and varied individual. Sadly, there is no way here to reproduce the animation, gestures and incredibly realistic sound effects used by Magqubu when he speaks of the bush and the wildlife. He is a master mimic, a living repository of the ancient oral tradition of his people. He is a remarkable person.)

Saubona. I would like to greet everybody here today. I would like to greet all the dignitaries from America and all the other nations that are gathered here today.

I was born in the place called Masinda where people used to hide during the times when people were fighting among themselves and stabbing each other with spears. We lived during hard times when our people used to be killed by the British and Boers who used cannons while we only had spears. We were able to survive those hard times and I want to tell you a little of our way of life. I would like to thank all the officials of KwaZulu and the other officials who have helped me give this to you. It is very important for myself and my people that you know a little of who we are.

The month of September used to be respected by our forefathers because this used to be a very important month for the wild animals. There is the call of the wildebeests. The Boers, the white hunters, used to shoot the wildebeest and it used to make a call while trying to escape from the bullets. KwaZulu is the land

of the Chiefs, the land of the kings, first Senzangakhona then Tshaka, who turned his clan into the mighty Zulu Nation, then Dingaan, Mpande and Cetshwayo who fought the British. Kwa Zulu was once a land full of wild animals like the elephant, rhino, kudu and crocodiles. We lived with and knew these animals.

I now come to the month of October which is also very important in the lives of wild animals. If we had stuck to the traditional laws, we would be living longer than we are living today. I can agree that the laws of nature, the traditional ones, are very difficult to abide with. If we had abided with the traditional laws of nature, the World Wilderness Congress would not need to happen.

The main reason for the World Wilderness Congress is to save our lives and the lives of our future children and teach our children the laws of nature. That is our main aim.

The white rhino is an animal that I first saw while I was still a young boy. When a male white rhino is proposing to a female rhino, it makes a certain noise. The cow will either accept or reject the male. If accepted, the bull will get on top of her and the female makes a different noise. When it is finished it will dismount. I know the white rhino very well as I was born amongst them. This animal is highly respected by our people. Everybody from Pietermaritzburg and Durban has great respect for the white rhino.

A white rhino only used to be shot when a permit had been granted by the officials in Pietermaritzburg. I can remember one occasion when we had to shoot one for the museum in Pietermartizburg. It had to be skinned very carefully making sure that no bones were broken. It was then put in a place where all the young children could see it.

When I was involved with Operation Rhino I heard a hyena laughing. The hyena had seen a pile of meat from the dead white rhino. The first hyena was laughing and signaled to the others that the meat had been found. The hyenas ate and finished all the meat. The next day the hyenas could hardly move because their stomachs were heavy. We have a description in Zulu which says the time of the hyena. It is that moment between night and day when everyone looks the same. Even the ugly ones.

The white rhino is the animal that I like the most. Dr. Player was the first person I saw touching a rhino. Dr. Player, Mr. Steele and myself worked under hard conditions in Umflozi Game Reserve catching white rhino. They were captured by darting them first and then when they went down, Dr. Player gave them another injection and we steered them into a crate. Some were kept in bomas and then sent to many countries including America. We also sent rhino to the Kruger National Park and other game reserves in Africa. Our work was hard and we worked night and day.

I used to be involved in antipoaching campaigns and we caught many people killing the wild animals. We were protecting the animals against the poachers. Another animal that lives in KwaZulu is the buffalo. We do not point at this animal by finger. We point at it by our fist. It was not called by its name—it was

called "the black ones." That is the way in which we respect the buffalo. I grew up among the animals and there were no fences during those times. We did not kill the animals without permission from our traditional king, King Dinizulu. He did not allow people to kill the animals and any person caught was severely punished.

I also grew up with the animals called zebras. The zebras used to make their calls all over the plains. They used to make these calls while they were running back into the game reserve at sunset.

I think it is a very good thing that we should stick to the old traditional ways of living so as to protect the future for our children, so that our children will understand what a wild animal is. When future generations come they will know what wild animals we are talking about and be able to see them. All my life I have been involved in the conservation of wild animals and I have seen many of my fellow Rangers killed by poachers when they were protecting wild animals.

I understand the plants and the animals, birds and insects. I can tell when rain is coming. All this knowledge is in my blood. I know of Hlonipa, the language of respect, which we use when referring to animals and in the presence of our Kings and Chiefs. We once had a way of living in the world and knowing what was happening on the land. We were in tune with all that lived and sang. Chief Oren Lyons and my people speak a common language, "people of the feather." I will present to him the tail of the wildebeest which has been decorated with beads by our women. It is carried as a symbol of authority. Chief Oren Lyons speaks with the wisdom of his ancient people and their values should rule the world.

I wish I could tell you about all the knowledge of my people, about the land, the animals, birds, the plants that are so much of our lives. I have really only just begun to tell you.

Hambani ghalhi.

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WARDENS OF WILDERNESS

Kailash Sankhala

The Thar, or the Great Indian desert, is an extension of the Saharan Arabian Palearctic desert biome. It is situated between 22 and 32 degrees north latitude in the states of Rajasthan, Gujarat, Haryane and Punjab. It lies across India's western frontier with Pakistan, extending over 270,200 square miles (700,000 sq. kms.). The land forms, such as sand dunes, barren rocks, pavements with stunted and scattered vegetation and tropical grasslands, designate it as a desert. Temperatures exceeding 50° C during May and falling below -3° C at night in January are inhibiting for life. The heat is augmented by vaporless hot winds including whirlwinds and chilled by freezing winds from the Himalayas. The arid conditions further increase when rains miss the region, year after year. Surface water hardly exists except in some ephemeral depressions in lake-like forms. Its salinity is high, and increases in the summer. Pelicans (*Pelecanus phillipensis*) come for fish and are followed by flamingoes (*Phoeni copterus roseus. p. minor*), who feed on microbes in these salt lakes. By mid-summer, water becomes more of brine fit only for salt manufacture. Wells are few and deep. A relay of camels or donkeys is needed to lift water from over 100 meters' depth.

A water point is a center of activities of animals and birds. It is the nerve center of the village, where village beauties gather and discuss all topics. Mother-in-law is a common subject. Since it is a social gathering, ladies change their dress every round they return. The display of the charming forms is splendid. In many cases, people spend half of their life only bringing water from the wells on camels and donkeys and lend a helping head to carry a pot.

RICH DESERT LIFE

Since less than a million years is too short a period to bring about any anatomical change, the story of existence of the wide spectrum of life in the desert is the saga of heroic struggle of survivors.

Uncertain water supply, limited food and scarce opportunity for feeding make life in the desert a risky living, yet, life exists rich in vegetation varying from grasslands dominated by *lasiurus sindicus* to scattered flowering trees of *tecomela undulata, prosopis cineraria, salvadore oleoides* and acacias. Also common are xerophytes on dunes and rocks, and halophytes along salt lakes. These vegetative producers support a variety of first-stage consumers and their predators. In the food chain of the desert pyramid, the energy flows from base to the apex and, provided there are no outside influences, ultimately returns to the base to be again converted for circulation in the endless process of life and death.

The desert is rich in insects. Most of the insect orders are represented here. The dominating ones are the ants. There are 17 species of termites. The desert

is the home of the locust, which is the means of sustaining many birds and reptiles. Grasshoppers and their larvae do all the eating of vegetation and in turn they are delicious meals for insectivorous birds. A majority of the land vertebrates live here. They vary from dinosaurian spiny-tail lizard (*uromastic harawickii*), purely a vegetarian, to the dragonian monitor lizards (*varanus bengalensis* and *varanus grisesus*), which are wholly carnivores. Snakes vary from dreaded banded kraits, the Sindh krait (*bungarus caevuleus*), saw scale viper (*echis caenatus*), and Russell's viper (*vipera russelli*), to nonpoisonous large rat snakes.

ANTELOPES

Sure-footed gazelles fly with ease on rocks and are also at home on sand dunes. The open landscape is the home of the black buck, a true antelope (*Antelope cervicapra*). It has its telescopic sight and lives in herds of up to a hundred, dominated by a strong male, black in color with deadly pointed spiral horns. Sometimes a small herd consists purely of rejected bucks who are always on the lookout for their reentry into a full herd, or for an opportunity to fight it out and separate a few does in order to establish a new herd.

There are 25 species of rodents. The desert hare is the largest one (*lepus nigricollis dayanics*). Curious specie hedgehogs (*hemiechinus aurihis*) and many species of gerbils (*meriones hurranae* and *gerbillus gleadowi*) occur.

AVIFAUNA

The desert is rich in birds such as munias sparrows, skylarks and common sand grouse (*Pterocles exustas*). The last one lives in family flocks of about four to six members, but are more gregarious at water holes where over 1,000 birds congregate to drink. This spectacle of birds lasts for but a few minutes every morning just after sunrise. The avifauna is enriched by winter migration of common and demoselle cranes (*grus* and *Anthropoides virgo*). They arrive in large flocks for feeding. Their arrivals and flight formations are sung in romantic songs of the desert. Birds arriving in still larger flocks are the imperial sand grouse (*Pterocles orientalis*). When they take off to visit a water hole it is like a volcanic eruption. The flights are soft and their landing sounds like a waterfall. The rollers (*Coracias bengalensis*) and bee eaters (*Merops phillippinus*) lend color to the desert. The grace of the desert is the "ostrich" of India—the Great Indian Buzzard (*Chirotis migracaps*). This miniature ostrich flies, but lot of effort is needed to be airborne. After a short distance, it glides to land. The lesser buzzard is a migratory bird which arrives in pairs from Arabia and Iran. The buzzard is the falcon legend of the Arab Emirates. Falconry, an expensive sport where one bird costs over $6,000, is a sport now banned in India.

Masters of the sky are the eagles and falcons, the largest of which is the tawny eagle (*Aquila rapax*). The lagger falcon (*Falcob armicus*) is the fastest in picking up partridges. Both raptors breed in the desert. There are two species of flying foxes—the common fox (*Vulpes bengalensis*) and the desert fox (*vulpes*).

They feed on desert fruits, insects, lizards, birds and mammals. They are at the apex of the biological pyramid and maintain the balance of nature in the desert. For vultures, there is enough to eat since cattle population is large and their underfeeding results in many deaths. The scavenging vulture (*Neophron percnopterus*) is bold and aggressive. The king vulture is big but shy. Its red wattles give it regality. All the same, they are scavengers. They start eating even without waiting for the formality of death.

DESERT FLOWERS

The desert blooms twice a year, first in spring when woody plants like tecomela and capparis decide to flower, and then during the rains when the annuals flower. They range from large cucurbita to macroscopic indigofers. Fruits of salvidore oleoides are juicy but slightly pungent. Plums of capparis are the delicious fruits. Cricket ball-like melons are called bitter melons (*cucurbita spp*) due to their taste. But rodents love them. They are also a source of water in the desert.

DESERT MAN

In terms of human settlement, the region is cosmopolitan—Hindus, Muslims and Jains. Except the Jains who are traders, all others are semipastoral, marginal agriculturists. There are traces of civilization which existed here even 2,500 years before Christ. Even the recent ruins of Kirada near Barmer are over 1,000 years old. Artists' concepts of what the desert was when man was part of the ecosystem are often presented in the miniature paintings of the desert school of art. It was a harmonious existence of man and animals, marking the time of the golden era of the desert.

This attracted outsiders. Loot, plunder, conversion and killing became the order of the day and influenced the way of life of the people. The open society changed to a closed culture, fortified in forts. Needs gave way to greed. Reckless cutting of trees and killing of animals began in any name shikar and trade. The land became treeless and lifeless. Droughts, famines, migrations, death and poverty prevailed, and desertification increased.

JAMBASHWARH'S BISNOI

Moved by the lot of the people, the heir apparent of Panwar Jagiradars of Pipasar left his fortress and preferred to roam in the desert to understand the problems of the people. He meditated for years on sand dunes. As a result of his meditation, he discovered that ecological disorder was the cause of their misery. He had no education and his arithmetic was limited to counting up to 20, that also because it was easy to count fingers and toes. But he had nine more things to teach. He added nine to 20 (Bis) to make 29, creating Bis-no (20 plus nine). The followers became Bisnoi. It was the need of the hour and the awakening spread like wildlife among semipastoral and marginal agriculturists of the desert. The Guru came to be known as Jameshwarji or, in short and with reverence,

"Jamboji." He preached the significance of trees and animals. He symbolized Khejari (*prosopis cinraria*) among trees worth a worship and black buck among animals as indicators of environmental quality. This was 500 years ago when ecology was unknown.

In every Bisnoi settlement, village or hamlet, antelope, gazelles and birds have a part to play. The howl of jackal is a healthy sign, and disappearance of that howl is supposed to bring disaster on the village. Therefore, jackals, foxes and even wolves are given protection.

Bisnoi men are tall and handsome, clad in snow-white clothes and large turbans, with a camel. The hard work of the Bisnoi women shape their forms. They are bold and colorful, and continue to be custodians of their culture. They surpass the menfolks in charm, beauty and jubilation.

AGRICULTURAL PHILOSOPHY

Their agriculture is full of chance, and they play this gamble every year for the opportunity to raise a crop of bajra. Their fields are open and the damage done to crops by wild animals and birds is considered a fair share, according to the Bisnoi farming system. Their philosophy is that sometimes their harvest is good because of the luck of birds and animals. Good luck of the animals complements the Bisnoi in their mutual search for existence in the desert.

KHEJARLI—AN ULTIMATE SACRIFICE

The Bisnoi passion for environmental preservation has no parallel in the human history. Some 250 years ago, when the 400-year-old fort of Jodhpur needed repairs, the Maharaja's man could find no sizeable trees to cut except in the Bisnoi village of Khejarli, which was known for its Khejari trees. This is hardly 20 kilometers as the crows fly from the fort. But it was not easy to cut trees—the symbol of Bisnoi culture. Bisnois hugged the trees to protect them even at their life's cost. The first to fall victim in protecting her trees was Amrita—a lady. Then her family was slain, and thereafter the sacrificial ceremony was simple. One by one, a Bisnoi came, took a bath and got his head chopped off. Three hundred and sixty two trees were cut only after 362 men were beheaded. When the Maharaja came to know of the bloodshed, he immediately issued a declaration that "No one shall cut trees and kill animals and birds in the territories of Bisnoi villages throughout the State of Marwar." No tree is cut and no animal is killed in these villages. The result is the richness of the environment. The Bisnois continue to be the custodians of the flora and fauna in the name of their Guru.

The incident can easily be passed on as a fiction. But the rich environment in density of trees and number of birds and antelopes, in stark contrast with the adjoining overfelled and overdestroyed land, is proof in support. The spirit of sacrifice is still demonstrated if anyone happens to stray from the main road. The whole village—men, women and children—come to stand between the wild animals and the hunters' guns. The animals have also realized to rush to the villages and hamlets for shelter. The confidence placed in men by the animals is

a unique example. A herd of antelopes, clean prosperous houses, healthy, charming and happy inhabitants loaded with silver and gold ornaments in casual innocence are the characteristics of a Bisnoi environment. Bisnoi settlements are not showpieces or demonstration plots, but extend over 30,000 square miles from Punjab, Haryana to the southwest end of Rajasthan—all a desert environment.

ENVIRONMENTAL TRUTH

There has been no second Guru in the last 500 years to rejuvenate the Twenty-Nine Principles, but their spirit has not faded. Five centuries is a sufficient period of time to test the truth. There is no second example in the world of a conservation culture of such commitment. People come to the Khejarli to pay homage to the heros who gave their lives to protect the trees. Men and women pledge for the supreme sacrifice in defense of their environment in front of the sacred fire. They assemble there every year in September to recharge their commitment. They also visit Mukam where the Great Guru rests in peace, to pay their homage to the Guru for the Twenty-Nine Principles he gave them for their prosperity. The ceremony starts with lighting a fire in front of the Samadhi, with praises of the Guru.

One must not carry an impression that they are backward tribals and that preservation of the environment is just a tribal custom. These are reformist Hindus, enlightened people who are part of the mainstream of India. Many are prominent in our national politics. Our Minister for Environment and Forests in the Central Cabinet, Shri Bhajanlal, is a Bisnoi. The Bisnois are in all walks of life, including business. They are masters of the land they plough. They have mechanized their farms and are proud owners of tractors, having replaced their camel carts.

IN PRAISE OF THE GURU

In the present context, their contribution to conservation is meritorious. But for the Bisnois, the desert would have been a barren land, depleted and deserted. It is their concept of the Biosphere Reserve, initiated five centuries ago. And all goes to the credit of the great ecologist, Guru Jambeshwarji, who is sung to every day with reverence and in thanksgiving.

Jai Jambeshwarji Maharaj ki Jai

PRAN TARANG— THE FLOW OF LIFE

Jasmine Shah

Pran Tarang takes you back through the corridors of time to a vision of the natural world rooted in antiquity. The earliest expressions of this vision are to be found in the *Vedas*, the ancient Sanskrit scriptures of the Hindus. "Knowledge," "vision," "wisdom" and "science" are some of the meanings implied in the Sanskrit word *Veda*. The earliest glimmer of this vision began more than 30, perhaps 40 centuries ago. The *Vedas* have come down to us unchanged, recited daily by an unbroken chain of generations "traveling like a great wave through the living substance of the mind."

These texts of philosophy were composed in Sanskrit, the classical language of India, which is ideally suited to describe the nature of phenomena, from the spiritual level to the physical. This range of applicability in the realm of nature makes it the language of nature.

The *Vedas* are the fountainhead of Indian philosophy from which have evolved not only the tenets of Hinduism, Janism and Buddhism, but also a rich tradition of mythology, classical music, dance and literature in India. Common to all of these are a deep sense of identification with, compassion and respect for all aspects of creation.

Beginning with this philosophical background, Pran Tarang presents these perceptions of nature through a rich combination of visuals, music and narration. The audiovisual opens with the sounds of the timeless conch and verses from the beautiful Hymn of Creation of the oldest *Veda*, the *Rig-Veda*. Chanted in Sanskrit by voices from ancient South Indian Temples, these verses dwell upon the evolution of life from a single primordial cause, the primary or eternal principle, the *Hiranya Garbha*. This hymn is remarkable for the beauty of its pure abstract, which was born out of a strong identification with nature.

Life is seen to have evolved from that single point of potency; all forms of creation are considered manifestations of the same basic living energy. There is a sense of unity linking all forms of life—human, plant and animal, mountain, river and earth in a primary kinship. Nature is not to be conquered or dominated. Instead, it is seen to be full of fertility and generosity. The difference between man and animal is not one of kind, but of degree. All forms of life, grand and small, are celebrated and respected.

In Indian mythology, animals represent life/energy, fertility and wisdom, and are associated with the gods as their vehicles and companions. Ganesha, the elephant god whose vehicle is the mouse, is the symbol of wisdom and humor. They show us that the biggest and smallest of all creatures are equally important.

Traditional Indian art in all its forms of expression—sculpture, painting, terra-cotta—is part of this same vision. The traditional Indian artist has seen in nature the thousand-fold reflections of ideas. The whole aim in his art is the expression Rasa or the passion which animates nature. Classical Indian literature, as in the verses of the immortal Sanskrit poet Kalidasa, continually reminds us of the grand qualities associated with mountains, rivers and clouds and the delicate emotions felt by trees and animals. Classical Indian music keeps man in close touch with nature and its melodies reflect nature in all her seasons and moods.

This integrated vision of life and creation is a philosophy which finds expression in every aspect of traditional Hindu life. Carried on the magic carpet of sculptures, scriptures, music and dance, and the deep resonance of Sanskrit hymns echoing around us, we receive a message which lingers and lives in our minds beyond the show.

ON LIVING IN HARMONY WITH NATURE

Hind Sadek

We should acknowledge that this sapient species of the genus Homo has not always been the despoiler of nature and the destroyer of life on earth. *Homo sapiens sapiens, Homo sapiens neanderthalensis, Homo erectus,* and many others before us have lived on this earth and shared the natural world with other living creatures. They extracted a livelihood and survived in both friendly and hostile environments through sheer ingenuity and technology, without polluting, destroying or marring the environment. And they did so for many hundreds of thousands of years.

Anyone who has visited the caves of Lascaux or Altamira cannot fail to recognize in the paintings not only great art, but the testament of an intimacy with nature and with life that can only be borne of love and of respect for life. There is an indefinable sense of spirituality on the walls of these 15,000 to 20,000-year-old caves. Looking back as you exit Lascaux is indeed a humbling moment.

The alleged pagan worship of animals of so-called primitive societies is

neither pagan nor worship. Today, yesterday and for millennia, the attitude of these societies has been one of brotherhood with the animate and inanimate world, including rocks, plants and animals. Hunting and gathering activities were aimed at human survival, not at the extinction of species nor the destruction of the natural world. And so, for millennia, the animals continued to roam and the forests continued to provide shelter and sanctuary for all.

The extraordinary phenomena of the modern world—the successes and excesses of modern technology which we identify with progress—are based on the inventiveness, creativity and industriousness of men and women. Its advances have helped alleviate much human suffering, cured men and women and children of disease, and much more. Yet, there has also been extensive degradation of land, resources and people. But I have a new hope that reversing that vicious cycle of development-equals-destruction is possible. It is a hope inherent in the concept of sustainable development; development that encourages economic growth and yet does not lose sight of the environmental imperatives.

Is poverty the single most important cause of environmental degradation, as has been suggested by some? I think not. Though it is true that in developing nations, parents who cannot feed their own children can hardly be concerned about clean air for their grandchildren, it is equally true that acid rain is certainly not caused by poverty or by primitive technologies. While slash and burn have no doubt contributed to the destruction of forests, and erosion of overgrazing has aided in the desertification and agricultural lands, so has the indiscriminate use of chemical fertilizers and pesticides, both products of highly evolved technologies. Another product of superior technology and of wealth, rather than poverty, is the dumping of toxic wastes by the millions of tons, which poses severe threats to human health and causes loss of habitat and species, with grave consequences to both developed and developing nations.

Damages to the environment and natural resources, which are accelerated by increasingly more efficient methods of exploitation, aggravate rather than relieve the overexploitation of native raw materials which, in turn, add to what the NCED has rightly identified as the "hidden costs" of environmental degradation. Since developing countries are compelled to pay these "hidden costs," the inevitable consequences to these countries and to their economies is financial debt, which translates into such statistics as: high illiteracy rates, poor national health services, low average per-capita income, and, yes, poverty! Furthermore, the high birth rates and alarming population growths which today characterize most developing nations accentuate their plight.

The fact is, however, that it is not poverty, but the *cause* of this modern, devastating poverty that constitutes our main concern. We must find alternative solutions for the cause, and not just focus our efforts on curing effects. Some may argue that this is too long term—not so. Both are needed—long-term projects as well as "specific, short-term projects" and "resolute action right where the problems are," to quote Mostafa Tolba of UNEP.

Debt-for-nature conservation swaps appear to offer immediate solutions

involving governments and banks. But it is the involvement of the citizenry of both the developing and the developed nations that is of greater and more profound significance. The fact is that we are now talking to each other and that we must find ways and means of talking to concerned citizens outside of our circles and we need to make sure we are being heard and understood. It is indeed a literacy campaign and one that must begin at the grass roots level of life. Young and old, developed and developing, must learn the language of conservation and sustained development.

THE ROLE OF NATIVE PEOPLE IN SUSTAINABLE DEVELOPMENT

Norma Kassi

I am of the Vuntat Gwich'in Nation—The People of the Lakes—of the far northwestern part of Canada. My village, Old Crow, is the most northern community in the Yukon Territory. I am a member for Old Crow in the Territorial Legislature. Since being elected just over two years ago, I have had the privilege to attend meetings across my country, to speak and to learn.

I am both a legislator and leader of my community and must constantly struggle with how to assist governmental officials, politicians and decision-makers to understand that the environment, to indigenous people, is not a matter of perspectives or forums. It is our life and our survival. Let me explain.

The Yukon is changing, and I want to share with you what those changes are all about, mostly by using examples from Old Crow, my community of 300 people.

Changes are taking place as well in the territory as a whole. For the first time in history, the new democratic government of which I am member has a majority of aboriginal elected members, including two cabinet ministers and the speaker of the legislative assembly. Even with this majority, it is sometimes difficult to create a cultural balance.

It is important to understand that in the Yukon, the land claims of the aboriginal peoples have never been settled. No treaties were signed and no conquest ever occurred. Our land claims negotiations are a difficult process. The claim involves more than land ownership. It also must address aboriginal self-

government—the right to decide what happens to our people and to all important resources of our lands; the right to continue to protect our resources, in other words, our environment.

My people have governed their environment for thousands of years in order to sustain their communities and lands for generations to come. Southerners and Northerners, white people and aboriginal people must come to an understanding and accommodation which allows the environment to sustain us both for all time.

Old Crow is located below the junction of the Crow River and Porcupine River. These rivers meet and then join the Yukon River, which flows through Alaska to the Bering Strait. Much like this great river system, the Gwich'in Nation extends throughout the Northwest Territories, the Yukon and Alaska. We have a language of our own and a strong culture based on the land. It has been documented that we have been a self-determined people for 30,000 years.

Through all these years we have lived and managed the resource in a sustainable manner. We have conserved and protected the caribou and other animals, and we have lived in harmony with the natural world. While you may think of us as living in the wilderness of northern Canada, we think of ourselves as being of the wilderness. We and our activities are part of our natural wilderness system and have been so for tens of thousands of years.

Our ability to live with our environment has always depended on our Old Ones, our Elders, who command the respect of the community and whose direction we must follow. The Elders train their children and educate them in our traditional ways. We are taught to conserve Mother Earth and all the resources she holds that are given to us so freely. By this I mean the basics of life that we cannot survive without: the air we breathe, the water we drink, and the plants and the wildlife that we eat and use. The land is not something which lies pristine and dormant, stretching away empty around my village. Every spring, for example, the village of Old Crow becomes nearly deserted as many families leave town to go muskrat trapping, or "ratting" as we call it, in the Old Crow Flats, many lakes north of the village.

From the month of March until June, our culture thrives on a springtime of hard work, traditional training and personal as well as family-unit development. The muskrats we get are an essential part of our yearly income. Their harvest is a focal point for our traditions. This is also true for many northern communities where fur trapping is a very significant activity where most people are not part of the wage economy.

Animal rights activists in the south and overseas who attack fur harvesting ignore the fact that Yukon's wilderness provides a basic subsistence living for most people. The antifur campaign is an attack on the survival of my community and the Gwich'in Nation.

My people are of the wilderness. We use the land and the animals. It is our life's foundation. Aboriginal people are an important part of the environment where I live—there may not be villages or roads everywhere, the evidence which

you may associate with human use, but we do use the land. So when southerners think about northern wilderness, they need to think about allowing traditional use of the land and wildlife by a culture much different from their own. It is good that some areas are set aside to protect wildlife and it is good that there are controls on industries and road building, but southern ideas of excluding all human activities from all wilderness areas is not an idea that my people can ever agree to. We conserve the resources and we have to use them to survive. We need the wilderness—for food and for life in general.

This spring I spent a month on the flats, a place which nourished me spiritually. But beautiful as it may be, I have seen a lot of changes there, changes that have taken place since I was last on the Old Crow Flats. Subtle changes, slow changes that the Elders talk of. In the environment, lakes are drying up here and there. Our snow water doesn't taste like it used to. Small animals—ptarmigans, rabbits, birds, ducks, migratory birds—are not as abundant as they used to be. As well, the behavior of the caribou has changed; it's different from what the Elders remember. There are more airplanes flying over our camps, including U.S. military jets flying tests. This is upsetting.

My Elders speak about these changes. They speak about them often and with concern. We suspect that many of the changes are the result of industrial developments in the south and in Alaska, and we fear the effects of nuclear testing, oil spills, chemical waste deposits, pollution and the influx of more people who see wilderness only as a resource to be exploited. We are very concerned. How much more can the land and the wilderness tolerate?

In Old Crow, the people believe that our future relies on our renewable resources. We are not interested in the exploitation of nonrenewable resources such as oil and gas. Huge developments such as the MacKenzie Valley Pipeline have been proposed for our area. Our village fears developments. The benefits from such exploitation of our lands flow all in one direction, and it isn't to our people. I do not believe we need a pipeline, a road or a port facility on the north coast to give us wage work. We have learned that oil industry work is unreliable; it comes and goes with the price of oil and gas. The large-scale developments such as the proposed oil and gas developments on the Alaskan North coast will be devastating for our people. We rely on the caribou that use the coastal plains. The caribou are our main source of food. We eat caribou meat three or four times a day—boiled, dried, roasted—from the nose to the insides, and we use the hides for clothing. It is the very essence of our survival and we intend to protect our future through the development of a local conservation strategy. We may have to make accommodations to other interests in the vast North, but we will fight to make our priorities known and included when decisions are made.

Our local conservation strategy will focus on six specific renewable resource issues of immediate concern: water, fuel, wood and timber, fish, fur, caribou, waterfowl and our involvement and control in the operation of the North Yukon Parks. With the support of the Yukon government, we will build a strategy that makes sure that the resources are not overused and that they will continue to be

available to us for all time. This strategy will involve our traditional laws and practices concerning our land and environment.

Scientists like to use big words when they talk about conservation—words like sustainable development, biological diversity and ecological stability roll off their tongues. But to my people of Old Crow, it all means one thing—our survival. There really is no acceptable alternative to conservation for my people—at least if we want anything like our present lifestyle and if we want a future which follows our tradition.

With a conservation strategy in place we will have a more secure future, but getting the strategy in place will mean hard work. If we have the strategy we can continue to hunt, fish, trap and survive with some certainty in our lives. The aboriginal people of our countries have the skills of conservation. We follow our traditional laws. When we take, we have ways of giving back. If we go out on the land and take a caribou, we give back some, we have our traditional ways of doing so because of our spiritual ties to the land. If we take fur, it is in balance with the muskrat that are available to us. We share with everything. We are part of the natural cycle and must live that way to maintain a balance between our needs and the available wildlife resources.

If we destroy the land and resources on which we depend, and with which we live, then we are destroying ourselves. The Vuntat Gwich'in Conservation Strategy will help us ensure that there is a future for the children of Old Crow, but it cannot stand on its own. Cooperative arrangements must be made with other organizations that share the responsibility for managing the resources on which we depend. Our Vuntat Gwich'in Conservation Strategy will stand a better chance of helping us because it will mesh with a strategy for sustainable development which my government is working on for the whole Yukon. But what about the world beyond the Yukon's borders?

The caribou on which we depend recognize no political boundaries. In Canada, they move between the Yukon and the Northwest Territories. Internationally, the herd moves from Canada to Alaska and back. We have recognized this fact.

The Gwich'in people in the Northwest Territories, the Yukon and Alaska are now all represented on the boards that make decisions on the management of the porcupine caribou herd that has all user interests represented, a majority aboriginal membership and an aboriginal chairperson. The government of the Yukon also has representatives on the board. The board has responsibilities for harvest allocation and deals with management issues, for example the decision that no commercial harvest of the herd will be allowed except for traditional practices of sharing food within the aboriginal communities.

This year an additional management mechanism was put in place. I represented the Yukon government in Ottawa this summer when the governments of Canada and the United States signed an international agreement for management of the herd. This agreement will establish a management advisory board designed to improve the cross-border communication of information

about the caribou. It took a long time to negotiate this agreement.

Unfortunately, in spite of all this, the caribou herd is still threatened. The U. S. Department of Interior is proposing to open the last 10 percent of the Alaska Coastal Plain to development—in the heart of the calving grounds of our caribou. They are doing this in spite of scientists' warnings about the potential effects on the animals, not just the caribou, but the birds, the bears and the muskoxen that use this area. I'm aware that there is considerable opposition to the oil and gas proposal in the United States, and I am grateful. The proposal is frightening to my people and it must be stopped.

Because we are opposing these particular oil developments in Alaska, we have been accused by some government officials and developers in the United States of being antidevelopment. Well, yes, we are, if "development" is always defined in their terms. Development to us is "preservation," and we have been successful to date in preventing their kind of developments in the caribou habitat in Canada. We depend on the caribou and our survival depends on their protection. We cannot tolerate any harm to these renewable resources that have sustained my people and our ancestors for many thousands of years. My people have contributed to the development of conservation policies that are now in place for the Northern Yukon. We now have the North Yukon National Park, which was established through the land claims settlement on the north slope, and we are negotiating a new land settlement for the Old Crow area. In time we hope to ensure even more protection for the caribou through a regional land-use planning process. But the developments proposed for Alaska National Wildlife Refuge lands will potentially destroy not only the habitat of the caribou, but of migratory birds, polar bears, foxes, grizzly bears and many other species of wildlife which live in the Alaska coastal plain and the north coast of Canada. It is time for our kind of development.

The migratory birds that use the area, for example, are the same ones that sustain people on Banks Island in the Canadian arctic, and they are the same ones that are hunted for sport in British Columbia, Washington, Oregon and California. The habitat pressures on these birds are growing all along their flyway, especially in places like California where wetlands are being converted to agriculture at a rapid pace. We need to be aware that these international resources are at very great risk. The world is linked together—we need to be responsible for one another's well-being and get away from this myth that we are only having little local effects with projects like those proposed for the Alaskan coastal plain.

Consider issues like acid rain or ozone depletion or the Chernobyl accident. The human species is affecting the entire planet now. With our waters poisoned, our plants and animals dying, then *we* are next. Everything *is* linked to everything else. We need to wake up to this reality *now*.

This message is one that definitely was heard by the World Commission on Environment and Development. Prime Minister Brundtland and the other commissioners heard the message being delivered by communities like Old

Crow and I hope in my heart that the world's leaders will also hear the message.

Similarly, we need the leaders of the U.S. government to hear the voices of the Gwich'in nation. The people of Old Crow must be heard, and I ask you for your support. I urge any of you with concern or influence over decisions about the Alaskan Arctic National Wildlife Refuge to try harder still to protect it from development. The very survival of our northern native communities is at stake.

As you can see, conservation and sustainable development are ideas that are very much alive in our minds. In our tradition we have always been aware of our unity with the life and the land around us, of our activities having an effect on the world beyond that which is immediately obvious.

As the Gwich'in people, we have hopes and aspirations for the future. We hope that the world will come together to conserve what we have left, and we hope that the cultural and traditional values of the world's people will follow the natural laws. We believe that our Mother Earth has had enough destruction and can't handle much more. The world is trying to deal with nuclear experimentation and pollution that has gone beyond our control. We see more and more people suffer and even we are affected where we live.

In Old Crow, we want to take care of what we have left and share it with whomever will respect it and do the same. The World Wilderness Congress is an effort in cooperation, just as is the work we do—together we can make the world a better place. I want to believe that my people can sustain our traditional lives—the environment demands it of us and we have grown to enjoy and believe that we, the Gwich'in Nation, can live forever in harmony with our surroundings.

Mahsi-cho!

HONORING LIFE'S INHERENT DESIGN

Michael Burghley

I'm sure that many of us have been thankful for the availability of our wild places as settings for true inspiration and education. I'm especially aware of this because for many years now I've had an association with an outdoor adventure school in central British Columbia, the Educo School. I've seen thousands of young people pass through the school over the years and have been aware of the

specific contribution that the wilderness has made to their discovery of inner character and inner worth. Obviously that is not the only element involved in such a situation, but it is a crucial one.

The massive urbanization which has been occurring in recent decades emphasizes the importance of the natural world as a place for reminding us all of the way life really works. In Canada only 2 percent of the population still live on the land. This has had a profound effect on the way in which life is looked at. When we look at the designs of nature we can see the delicate and yet powerful way in which the natural systems of life fit together such as a spider's web, with all its precision and geometric exactness. Such a simple, silent thing hanging there, and yet representing a factor of absoluteness that is present throughout the natural world and, for that matter, is present in our own bodies and in our whole experience of life wherever we may be. The problem for us has been that so often we tend to be distracted from that awareness of absolute design.

We are keenly aware of the degradation that is occurring on the planet as a whole. I would like to remind you of some of the words of the Denver declaration:

"The productivity of the earth's natural resource base is rapidly deteriorating, as evidenced by desertification, deforestation, accumulation of toxic wastes, polluted drinking water and oceans, diminution of wilderness habitat and loss of genetic diversity. It is clear that, under the demands of increasing human population, the overall situation will continue to deteriorate."

We have in that description a summary of where human experience is today. The world condition reflects the inner state of its human inhabitants. Furthermore, the true severity of the deterioration of the world's economic and environmental conditions, for the most part, has not really been grasped. We do not have much time left. In fact, the repercussions of many of the things that have already been instituted on this planet in the way of degradation will have to be played out, and there will be heavy effects which will impact us all. There is the inclination, especially in North America, to look out at the broader picture and say that those in Third World countries need to deal with their population problems, as though somehow we weren't on the same boat! Only their end of the boat may be sinking, but we all go down if it goes.

There is much evidence of a huge destructive momentum moving in many fields. So often those who are knowledgeable in a particular field are very concerned about it; they see a disastrous situation looming. But they often feel that, while this is true in their individual realms of responsibility, the rest of the world is hanging together pretty well. However, at this 4th World Wilderness Congress we have begun to realize that everything is interconnected, and that there are serious problems in the whole fabric of the earth.

Chief Oren Lyons remarked, "The natural law is a spiritual law. Its powers are both light and dark. We are blessed and we prosper if we live by the law. It is dark, terrible and merciless if we transgress the law. There is no discussion with the law. There is only understanding and compliance. Its tenets are simple....The decision is simple. Obey the natural law or perish."

These are wise words, spoken by one representing a people who, in their history, have been more closely connected with the Earth Mother than most of us, and who have lived in an awareness of the Great Spirit. These words must be heeded. Indeed, the leaf emblem of the Wilderness Congress represents this wisdom. As you probably are aware, the idea for that emblem came from Magqubu Ntombela, the Zulu elder. The two smaller leaves lower down on the stem represent man's relationship with man and man's relationship with the earth. But the central frond, pointing upward and much larger than the other two, represents man's relationship with God.

This isn't the God of common and religious belief, but one who simply represents the way life works: a symbol of the universal law, the universal spirit, which informs us all. We have violated the laws that govern nature and which are evident throughout this planet and beyond. Oren Lyons stated that the tendency to ignore the law brings certain repercussions. It is of no ultimate avail attempting to deal with nature's laws without an acknowledgment of this point.

We need to admit that there is something that goes beyond our own immediate abilities, so that we step back to a place of greater humility and stillness in ourselves. Then we may have the space internally to perceive and respect natural systems and to sense what our relationship with them actually should be. If we are too taken up dealing with the problems that are immediately at hand in the external sense—though they certainly do need loving attention—to the exclusion of respect for life's inherent design and purpose, then the actions we take will inevitably create further problems.

The real point here is that we belong to life. Life does not belong to us. Many things have been said about the benefits that wilderness can give us. How about asking the question, what is it that we should be providing for the world in which we live, rather than all the time thinking about what we can take away, what may benefit us? Oh, we'll provide a little protection here, a little care there, so that we can have what we want. But the question is: What does life want of us? That never seems to be considered.

Population is a major issue on which the World Wilderness Congress needs to focus. In the external sense the population explosion is the ultimate problem that we're all facing, so much more discussion is needed. Perhaps we think it inevitable that population growth will continue until we have standing room only on the planet and all we can do is see if we can devise ways of accommodating this. There is certainly more to the issue than resignation! Does not the population problem epitomize the feeling extant in the human race that we want the right to have the sexual aspect of our lives to ourselves? We talk about the need for education in this field, about the need for people to be aware of the impact their actions have on the planet as a whole. But people love children, and people feel insecure. They feel that if they surround themselves with sizeable families, that is security. I'm a fine one to talk about this: I have two children and live in wealthy North America!

It has been said that those who live in the developed world and who don't

think they have a population problem need to look at their consumerism, because that is the same expression of wishing to fill out one's life in a way which is satisfying, fulfilling, secure.

Chief Lyons impliedthat the place fulfillment comes from relates to harmonization with the natural, spiritual Law, not from surrounding ourselves with glitzier surfboards or larger families. I'm talking about sacred things here. In the end we are all brought face to face with ourselves personally. It is not a matter of arranging the rest of the world, but of considering what my stance is toward the world where I live, toward life and the laws of life. Am I willing to put aside the well-established self-preoccupations that have been present for me, so that I have the openness to accommodate the requirements of the universal law and so that I can sense what it is that life actually calls for me to do?

There is a statement in the book *Touch the Earth* which speaks of the native American, but which really speaks to each of us and the genuine potential in each of us: "He believes profoundly in silence—the sign of perfect equilibrium. Silence is the absolute poise or balance of body, mind and spirit. The man who preserves his selfhood is ever calm and unshaken by the storms of existence—not a leaf, as it were, astir on the tree; not a ripple upon the surface of the shining pool.

"If you ask him, 'What are the fruits of silence?' he will say, 'They are self-control, true courage or endurance, patience, dignity and reverence. Silence is the cornerstone of character.'"

With the increasing pressures of our day and the crises that face us all in one way or another, it is only that individual who has come to a place of inner stillness and silence who will be in position to stand steady and act wisely with respect to what arises. When the pressure rises, pleasant ideals tend to fade away. Should the economic situation collapse, should the environmental situation go from bad to worse, should the population situation be uncontrollable, what then? Who will be calm and unshaken? Who will be able to provide any wisdom and perspective? That is the challenge I leave with you.

It is something that, for myself, I must ponder deeply, knowing that my actions in the external sense will carry healing and blessing only if they spring from this clear, still place of harmonization with the laws of life. They are there to be sensed and related to if our inner eyes and ears are open to them, if we are not taken up with our own adventures, our own goals and ideals, our own opinions and beliefs, but are still, in a place of silence. There life speaks like thunder for those who are listening.

WILDERNESS AND THE SOUL

John A. Sanford

As a Jungian analyst, my focus is on one individual person and the inner life of that person, which I like to call the soul. It is a very different kind of focus than most people consider when they deal with conservation. The question might be, of course, what does the soul of a single individual have to do with the larger theme of the conservation of nature with which we are all very concerned?

There are three aspects of my work with the soul of a given individual that can be related to the issues of conservation. The first concerns what we call in the language of my psychology, individuation. The process of individuation revolves around getting the bad news about yourself, facing the things you would rather overlook if you could. C.G. Jung observed that the people who kept coming to him over the years were engaged in a process, a lifelong process, of becoming a whole, completed personality. This process, he felt, was not something that they chose or decided upon, it was a process that was thrust upon them from an unconscious source buried deep within them with such strength that it became an inner necessity.

Jung named this process "individuation." He chose that name for several reasons. First, because he believed that process was seeking to bring that particular person into his or her unique fruition as a human being. Because, of course, while we are all members of the same human race, no two of us are ever alike. Each one of us has his or her own destiny and personality calling for fulfillment. This very individual quotient to our personality can never be discovered by a collective means. It must always be discovered individually and personally. Jung called it individuation because he believed that this process was attempting to bring about a person whose personality was no longer divided, a person in whom the conscious personality and the unconscious personality were now in harmony and accord. It is of course an ideal goal. No one ever reaches it completely. But the striving for it lends to life a sense of meaning even when things are going badly.

Now, to many people this may seem perhaps an esoteric idea, but actually it is very commonplace. In fact, we see something very much like this everywhere in the natural order. Everything that lives is impelled to its proper goal and fruition by its own inner dynamic force. If we went out into the hills and mountains and we came across a great oak tree with its great spreading branches, great massive trunk and its firm strong root system, we could say there is an acorn that has individuated. There is an acorn that has reached its proper destiny, fulfillment and goal, for it is true that contained within the acorn there was, in potential, the mature tree.

So in nature too, everything individuates. Jung once said, "Everything living

dreams of individuation, for everything strives towards its wholeness." It is, in the final analysis, this power that heals. The psychotherapist knows that he or she never heals anyone. They heal themselves, and they are able to heal themselves because each person has within himself or herself exactly that same power that lies within the acorn—a built-in knowledge and striving of the goal toward which we are summoned. And the healing process is to realize the goal and make it a reality.

There is, however, in human being, a difference between us and the oak tree. In the life of the oak tree, so far as we know, it all proceeds along biological and natural lines. In the life of the human being, this process of individuation that moves toward wholeness must be consciously understood and realized. It all must go through an ego that has been awakened into consciousness. So on the level of our human life this otherwise very natural process has a markedly psychological and spiritual aspect.

The second thought I would like to suggest to you revolves around the idea of what we can call the "center." In this process of growth, of individuation, we discover that a process takes place in the personality. The personality is centered originally around the ego, the "I" part of us which lends to our personality an irritatingly egocentric quality. We find that as that person moves toward wholeness, the center of the personality shifts from the ego to a much greater center within us, a center which Jung called the "Self." And so in our psychology, there are two centers to our personality rather than one, the lesser center of the ego and the greater center of the Self. The process of individuation requires that the ego, while vitally important for the accomplishment of this process, must eventually subordinate itself to the greater and larger reality of the center within. Only in this way can we be healed, only in this way can we be fulfilled.

In a religious language this greater center within can be likened to the will of God, and has been so described in religions of all sorts. To mention just one, from Saint Paul, where he declared, " It is no longer I who live, but Christ who lives in me," meaning in psychological language, his life is no longer organized around the striving, wishing, willing "I" (the ego), but around a much greater reality within himself that he termed, "the Christ within." It is out of this larger reality there emerges our unique identity. Out of this larger inner reality that there emerges the purpose of our lives. And I think it is this larger reality, the self, which embodies a natural law of which indigenous people speak.

Nature also has a center. In nature, all forms of life are interrelated. No unit or species of life in nature exists by itself. There is an interconnection amongst all things. Left to itself, nature will achieve a balance. It is as though there is within the natural order an invisible center. Indeed, sometimes within a certain species there appears to be an invisible center. If you study a colony of ants you notice that each ant seems to know exactly what to do. But, according to a study done on ants, if the colony of ants were reduced to a number below 200, the individual ants became disoriented and no longer knew what to do. We could say that the center of the ants was within the colony. Among the ants there was an

invisible center guiding and regulating the life of each individual ant.

So nature, too, has her center and we call this in the language of ecology, the "ecosystem." We know in that if the balance of nature is disturbed, which it is by the intrusion into nature of egocentric human beings, then the ecosystem is disturbed and everyone in time will suffer. In the same way, if that same arrogant, egocentric ego tries to dominate the personality of the individual, then that individual's balance is disturbed and illness results.

The third thing I would like to mention has to do with dreams. How might we find this inner center? How might we know about the greater life of the self? There are many ways, but one way is the analysis of our dreams. In the course of a great deal of this kind of analytical work, dreams are very important. They are not the only thing that is important, but they are very important in the work for several reasons. First, dreams relentlessly portray to us the truth about ourselves. They lay out for us the way things are in the state of our souls. To look at dreams, therefore, is to look at the way things really are within us, and sometimes things within us are much worse than we thought, and sometimes things within us are much greater than we thought. The dreams are also endlessly creative. One thing at which I marvel is that in the tens of thousands of dreams about which I have listened to and examined, of myself and of my clients, with only infrequent exceptions, has there ever been a duplication. The dreams are endlessly original. They may bring up the same motif, but each one says it in its own uniquely clever way. It is as though the dream story fabricator within us is a brilliant author, constantly thinking of original plots.

So there is in our dreams evidence of the endless creativity of the Creator. And then, too, the dreams emanate from our deep self. When heeded and listened to they lead us into a relationship with this deep Self and therein we find our purpose. Although we use our dreams in depth in psychology and we think perhaps of people like Freud and Jung bringing this to our attention, analysis itself is very ancient. The first Jungian analysis, to make a small joke, was the prophet Daniel in the Old Testament. He summed up the essence of Jungian thought on dreams in one sentence, "King Nebuchadnezzar of Babylon had a dream. He could not understand his dream and his various magicians and dream interpreters were unable to interpret it. But he heard that the Hebrew prophet Daniel was skilled with such things and so he summoned Daniel and he told Daniel his dream. And Daniel interpreted King Nebuchadnezzar's dream. And after he had finished the King said to Daniel, 'Why did the dream come to me?' And Daniel said, 'The dream has come to you, O King, in order that you may know the thoughts of your inmost mind.'" And there it is in a nutshell. The dream brings to us the thoughts of our innermost, unconscious mind, for the purpose that we may know, understand, and become conscious.

Others, too, relied on dreams by our time. I could make quite a list. The American Indians relied on dreams. They said that the Great Spirit knew, that we would wander in darkness and error in this world, and so he sent us dreams to be a light and a guide to the soul. And so did inspired spirits in all ages. In the

nineteenth century, for instance, that most materialistic and deterministic and mechanistic of all centuries, we find such persons followed their dreams as Abraham Lincoln, who has left a record of them, Dostoyevski, Robert Lewis Stevenson(who dreamt the plot of Dr. Jeckyl and Mr. Hyde) and Emily Brontë.

Dreams also are filled with symbols drawn from nature. Earthquakes, forests, streams, rivers, meadows and flowers abound. As an analyst I could always tell how well someone is related to their unconscious psyche by examining their dreams to see if they are in a good relationship with the animals that appeared in their dreams. Just five days ago a man brought to me a dream with a sketch of a magnificent spider web. In Jungian understanding, this is a dream of that center I mentioned earlier which, like a spider, catches disparate things and brings them together into its web and its center.

Does nature dream? We know that animals dream. Maybe Jung is right. Maybe everything dreams. I would rather quote the American Indian shaman, Lame Dear: "A human being is many things. We must learn to be different, to feel and taste the manifold things that are us. The animals and plants are taught by Wakantonka what to do. They are not alike. They all have their own ways—the leaves of one plant on the same stem. None is exactly alike. The Great Spirit likes it that way. All creatures exist for a purpose. Even an ant knows what that purpose is, not with its brain, but somehow it knows. Only human beings have come to a point where they no longer know why they exist. They don't use their brains and they have forgotten the secret knowledge of their bodies and their senses and their dreams." Whether we have recognized it or not, many people are conscious today of such hunger in themselves. Our souls are empty and they yearn to be filled.

20,000 YEARS OF ANIMAL ART

David M. Lank

Our legacy of wildlife art provides the most enduring record of how man has seen—and interacted with—the world around him. In the earlier years, the artistic outpouring seldom consciously segregated man from his world, for man never questioned that he was one with his surroundings. Reviewing 20,000 years of creativity is, therefore, not only an aesthetically delightful exercise, but also a trustworthy way of gaining insight into our own social roots. It is my firm

conviction that any civilization worth its salt must be judged on how it views and treats the world around it. The written record covers too short a time span, and changes of words, language and meaning distort our ability to understand fully the tempers of people past. The visual record is a far more trustworthy guide.

It is a rather extraordinary task to present 20,000 years of art in a paper such as this covering all cultures and all mediums. You will therefore be glad to know that during the introductory paragraph we covered the first 13,000 years. It is a shame to gloss over time and art, the two elements that most firmly establish our place in the total scheme of things.

We are part of the animal kingdom, the biosphere and the ecosystem. But the dividing line between man and animal is now being examined more closely than ever before. Our traditions taught us that we were "Man the Thinker." We now have extensive empirical data showing that a lot of animals can consciously think, at least to a limited extent. We have long talked about "Man the Toolmaker" as a dividing criterion, but then we see Secretary birds grabbing large pebbles and hurling them at ostrich eggs. Chimpanzees and the great apes pile up chairs to get at the last banana, and the Darwinian woodpecker finch uses a tiny thorn to pry a grub out of a rotting Palosanto tree in the Galapagos Islands. So, "Man the Toolmaker" isn't quite as good as it used to be to separate us from the rest of the animal world.

What about "Man the Artist?" Man the artist is unique. I do not consider finger painting by a chimpanzee to qualify, even though it is more than qualified to hang in some of the more trendy art galleries.

Long before man had been dissected and studied by anthropologists and sociologists, before we were conscious of skin color or contending religions, the artistic impulse appears to have been at the forefront of our entire civilizing evolution. And art has continued as a vital part of all cultures over the 20 millennia since man emerged from prehistory into protohistory. In the limestone caves of Lascaux and Altamira and the Pyrenees region between France and northern Spain, some of the greatest animal art of all time was created *NOT* to be seen. The artists selected the darkest almost impenetrable recesses where few could have gone. Art was the vehicle chosen to underline man's inexorable participation in nature—man and animals meant man and life.

There is an artistic message that comes across the centuries. The various species, the movement, the character are all forcefully depicted yet sparse in detail. You cannot see every hair. The artists felt no need for the microscopic detail which tragically, from my prejudiced point of view, seems to be the leading religion of many of today's wildlife artists. Let me sound a cautionary note: most of the Limited Edition Art Prints—or prints in unlimited numbers with limited art—are to serious art what pop stars are to serious music.

In cave paintings the essence of the animal was there, whether on monumental or diminutive scale. This applied to primitive sculpture, whether in clay modeling of an extinct European bison from 13,000 B.C. or a flotilla of tiny seabirds of ivory from the Inuits of St. Lawrence Island in the Bering Sea.

The currents of art run deep. After thousands of years of isolation, the Quechua Indians of the Inca Empire would put little totemic figures of llamas into graves for use in the afterlife by the deceased. Parallels can be found in all primitive cultures throughout the world. Primitive animal art was less a celebration of the animal itself than it was an attempt to integrate animal life into human activity. Animal art, as we shall see, assumes a very different meaning as we enter the modern era.

Styles obviously change. The Egyptians knew how to draw, but their style appears distorted and flat to our eyes. They understood that perspective is a trick of the eye and that the farther away something is, which is the same size as you are, the smaller it appears, not the smaller it becomes. To compensate for this optical distortion, they made all of the cattle the same size, even though some are farther removed from the viewer than others. And yet in their art you can feel the powerful movement of that herd—almost hear the lowing—as it walks to its destination. It would appear similarly when they depict a gaggle of geese—the rules of perspective that we insist on today would be ignored. But the bustle and the imminent chaos would still be there.

I use the Egyptian experience to emphasize that there is no one right way of making art. There are lots of different approaches, each of which, when excellently done and conceived in the right spirit, is equally meritorious.

The Greeks knew that art and utility were not in conflict. Some of the finest classical art is to be found on pottery intended for domestic use. For example, there is this wonderful black-figure kylix of Dionysius returning on his little vessel with the grape arbor mast. Joyously guiding him home are dolphins leaping and sporting. They are not "accurate" in the modern Richard Ellis sense of underwater painting, but there is no doubt as to what they are doing.

The Scythians were considered barbarian nomads, but they appreciated the work of their captured Greek goldsmiths. On a 2,000-year-old pectoral, there is a 3/4-inch long sheep being milked, which is a study of the mutuality of interest between flock and shepherd. In no manner should size determine artistic greatness.

In the Pompeiian frescoes, even with the passage of two millennia, one has no difficulty at all in recognizing a magpie or a guinea fowl. There are no guinea fowl in southern Italy, nor have there ever been. It is an imported species from Africa. Animal art begins telling us where people traveled and traded. When Vesuvius erupted in 79 A.D., the magnificent Roman frescoes of Pompeii and Herculaneum were snuffed out, and for almost 1,800 years were lost.

The development of our Western animal art really sprang from indigenous roots whose continuity was snipped off from the classical world. The thrust of Western animal art has been profoundly influenced by *Genesis* 1:28, in which God gave man "dominion over" everything that flies, swims, walks and crawls. Not surprisingly, this conceit led to a corpus of art with animals in the service of man, not of animals in their own right.

Above all, animals represented food. Food meant hunting or domestication.

Food also meant cooking and eating. There are thousands of examples of animals in art depicted in one of these settings. Even as great an artist as Rembrandt could portray a flayed ox.

With status came institutionalization of killing. There is a subtle difference implied between killing for food—hunting—and killing for fun—sport. Based on hunting paintings, if you are a scorekeeper, the animals were not winning. They are usually shown at the wrong end of someone's spear, gun, trap, net or fishing rod. Such paintings number in the thousands.

In all such cases the animals were in the service of man. Overwhelmingly, animals in their own right were ignored. Great painters such as Titian, Tintoretto and most of those we associate with the Italian Renaissance boasted about the fact that they knew nothing about animal anatomy because the church taught that animals had no soul and, therefore, animals were beneath the dignity of a serious artist. The examples of awful animal renderings in so-called masterpieces are truly embarrassing. Leonardo, Albrecht Dürer and Bruegel are real exceptions.

In order to trace the evolution of animal art as we know it today, we find the real thread of continuity, tenuous though it might be, in books. Some of the earliest admittedly paralleled the developments in other art forms. The illuminated manuscripts in the sumptuous Books of Hours for the Duc de Berry have gem-like butterflies, flowers and birds in the margins for use as decorations, religious symbols or real participants in historical events—but always in the service of man. Not surprisingly, some of the earliest books containing animal art dealt with hunting and falconry.

But sometimes the tables were turned—engravings of man in the services of animals. One of the most delightful examples dates from 1633 in Olina's book on birds, presenting how to recognize them, take care of them, feed them and—back to the service of man—how to eat them. One plate on how "to stimulate the nightingale to sing" shows several clusters of musicians on lutes, dulcimers and celestes playing for their stimulation. Another plate shows how to prepare special food in a noble's kitchen, but another gives graphic instructions on how to impale little birds on a tree, before roasting 16 at a time on a skewer, before popping them into your mouth.

Then as now, art needed patrons. The church—directly and indirectly—was the largest patron and animals, therefore, could not expect much support. Ironically, a pre-Christian author was largely responsible for the lack of change in attitudes. Pliny, who died in the eruption of Vesuvius, wrote in his *History of the World* about whales that were 600 arpents long and three feet wide which, conveniently, lived in the deserts of Arabia where verification was difficult. This total divergence of fact and reason suited the church just fine. Down to 1634 with the first English translation, Pliny's 2,000 year out-of-date natural history was widely accepted as a sort of parallel gospel.

But the first glimmerings of what we would call science were discernible by the mid-sixteenth century. Pierre Belon of France and Conrad Gesner of Zurich

produced major works which included hundreds of woodcuts of birds, animals and fish to accompany texts that, while incorporating some new material, relied heavily on Pliny, Aristotle and even earlier naturalists. It was Ulysses Aldrovandus of Bologna who was the first man ever to hold the title professor of natural history as opposed to natural philosophy. His multivolume sixteenth century work included firsthand field knowledge, and represents a significant pushing back of the frontiers of ignorance.

Woodcuts from the sixteenth century are stiff, but only because of the technical limitations imposed by the grain against and across which the engraver had to incise his lines. The original watercolours from which the cuts were made show that art was filled with subtle and fluid lines when the medium permitted.

Before being too quick to criticize the crude-looking cuts, let's admit that most of the species are instantly recognizable, which was no mean feat without the aid of colour. And remember, too, that 400 years ago, when these were done, Copernicus was still alive, Kepler had not yet discovered the laws of planetary motion, Newton had not yet been hit on the head by the apple, Descartes had not yet begun to think and therefore wasn't, the earth—not the sun—was the center of the official universe and, of course, Galileo had not been forced to recant. The woodcuts in the books of Belon, Gesner, Aldrovandus and their contemporaries are a visual link with the dawning of intellectual scientific thought in our Western civilization. In effect, they come from a world as different from ours as are the planets revealed by modern space probes.

Freedom of artistic expression in books was accelerated by the introduction of new technology. This is part of the human experience: technology allows leaps forward, not just leaps backward.

Copper engravings were used successfully for the first time at the end of the sixteenth and beginning of the seventeenth centuries. The birds and fish found in the books of Willoughby and Ray are a quantum jump beyond the woodcuts on which many were based. The most obvious next step was to combine the freedom allowed by copper with the artistic potential inherent in colour.

The first natural history book published with colour plates (as opposed to black and white intended for future colouring) was Eleazar Albin's *Natural History of Birds* from 1728 to 1731. On the title page of the first edition we read that the book was "published by the author, Eleazar Albin and carefully coloured by his daughter and self." She was so much better an artist that her name was taken off the title page of the second edition by her jealous father. In Elizabeth's work one notices not just a bird, but decorative elements that add an appropriate touch to the scene.

Mark Catesby was working on *A Natural History of Carolina, Florida and the Bahama Islands*, the first comprehensive natural history of North America. As a botanist Catesby taught himself how to engrave plates. He was beyond his predecessors in that he introduced birds and animals doing something, rather than just sitting there. His meadowlark and blue jay are classic examples of poses that show an activity associated with a particular species.

Catesby did magnificent plates of snakes, and this brings to mind the fact that we in North America tend to be species-oriented rather than art-oriented. A really bad painting of a bald eagle will surely sell more easily that the greatest portrait of a Wampum snake. Catesby achieved new levels of layout and artistry in his snake plates, but they can hardly be called popular.

Catesby also pioneered placing his animals and birds into settings that incorporated appropriate ecological elements. For this he is often called the "Colonial Audubon." If some of his figures are less than perfect, we can kindly remember that they had been collected 20 years previously and had been stored in kegs of dark navy rum. Catesby had to reconstruct a lifelike rendering from a soggy mess and copious field notes.

The evolution of animal art picked up speed as we approached the close of the eighteenth century. Peter Paillous was producing imposing life-sized raptors and water fowl for Thomas Pennant's *British Zoology*, one of the most important books on natural history of all time. Perspective, foreshortening, creative torsion and tension in the bodies were now standard elements.

At that time, there were even artists/naturalists who were trying to make a living in the publication of natural history books. Edward Donovan was one such entrepreneur. He could rightly point out that the more than 2,000 hand-coloured copper engravings in his 30-odd volumes were individual works of art. The underlying engraving was so faint that it basically ceased influencing the tonality of the finished plate. He laid on the colours in lavish amounts and completed the detail where necessary with a single-hair brush. On his insects, he added gold leaf and individually varnished the wings of dragonflies. The process was too expensive and too time-consuming to be economically viable, and so Donovan's books are considered among serious collectors to be little more than highly treasured oddities.

The artist who had the biggest impact was Donovan's contemporary, Thomas Bewick from Newcastle-upon-Tyne. Bewick's *Birds and Quadrupeds* revolutionized the art of the time and the art in books. By the simple act of turning the wood blocks on end to remove the impediment imposed by parallel grain, he was able to move his graver with the same freedom as would a silversmith. His birds—drawn from life—were brilliantly alive, and the textures of feather, rock, leaf and water were wondrously differentiated. Everything was accomplished with only black and white lines. His creatures were seldom more than an inch or two long, frequently far less, but they proved that monumental art could be achieved on a miniature scale.

Bewick is worth mentioning for another special reason. In 1790 he recognized the uniqueness of his thumbprint, and used an engraving of it as a receipt for copies of his *Fables of Aesop*. This was a century before Francis Galton published his great study on thumbprints which laid the foundation for a branch of forensic science. A hundred years earlier, an artist had anticipated a scientist. This is one of the reasons why I am pleased that art is treated seriously at the 4th World Wilderness Congress, because artists have every bit as much right to have

input into the environmental consciousness as do those of a scientific bent.

The turning point between the old and the new was focused on Alexander Wilson. After this Scottish poet wrote some unnecessarily accurate verses about the good burghers of Paisley, he found himself on the next boat to America, where he devoted the rest of his life to the first comprehensive bird book of the new world. As he had been trained as a poet, it is not surprising that his text was magnificent. As an artist, at his best he was better than any who had come before, but at his worst he had little to commend him. Yet, the whole of Philadelphia fell over themselves to become his champion and his patron. Ironically, the adulation of Wilson closed the eyes of Americans to the greatness of John James Audubon who, when he had seen Wilson's birds, rightly published his own.

Audubon's start was quite modest. After Wilson's early death, Charles Lucien Bonaparte published what is known as *The Continuation of Wilson,* being those birds that the Scot had not seen. One of the plates in Bonaparte's book was of the great crow blackbird, known to us as the boat-tailed grackle. In the picture, the male in the foreground was by Rider. It was obviously nailed to the branch. There was no accuracy or truth in the rendering of the body or feathers, and the muscle and skeletal structures were completely lacking in conviction. It was, in short, a typical bird painting of the period. However, the female in the background could not have been done by the same artist, and it wasn't. The bird is alive, full of tension, and exhibits the essence of species. And it was the first painting by Audubon to be published.

But Philadelphia scornfully rejected the man who would change our way of viewing wildlife—and by extension, the way we see ourselves in relation to wildlife. Audubon took his portfolios over to Edinburgh and London, where he was to publish the greatest bird book of all time, *The Birds of America,* four double-elephant volumes with 435 hand-coloured copper plates.

To say that Audubon was a mere illustrator or just a wildlife painter says more about the critic than it does about this man of towering genius. History had, however, perhaps been too lavish in its praise of Audubon's originality, for many of the things that Audubon is credited with were actually pioneered by others. Others had painted birds life-size, but not up to the size of the whooping crane. Others had used proper ecological backgrounds, but never had they been so spectacular. But working away in Henderson, Kentucky and other backwoods areas, Audubon had not really had access to what others had done before. He independently arrived at the solutions and, in the process, far surpassed anything done by anyone before.

Time and again its so-called distortions have been proven incredibly accurate through the advent of high-speed photography. And time and again have critics pointed out specific faults in a small number of plates in order to condemn the whole. Despite admitted failures and even occasional plagiarism, it can be said that John James Audubon marks the transition from the old to the modern, and that he represents the first truly great wildlife artist in history.

Audubon did not just represent wildlife art; he represented art. His Great

Eskimo Curlew is a case in point. The upward motion of the neck and the slight swelling of the guttural sack tell of notes you can hear if your eyes become your ears. The angle of the beak is echoed by the countermovement of the waving grasses. In his plate of the yellow-breasted chat there is a visual bond between the male and the female on the nest. The two birds flying with their feet hanging down are not a mistake— that is the way chats fly during their nuptial dance. We are seeing birds as they are in nature, not artificially composed decorations conforming to the dictates of some passing taste.

The Birds of America overshadowed Audubon's other great project, *The Viviparous Quadrupeds of North America,* perhaps the greatest animal book of all time. An author stated recently in a leading wildlife magazine that Audubon did not know his animals as well as he knew his birds. To show that the poses were contorted, the author chose as his example the grey fox. I once spent a day with a grey fox. Every time it changed direction or something caught its attention, the fox would hunch his back and raise his paw for just a split second. By studying the picture carefully, at the extreme top right of the plate you can notice a small feather wafting down. The bird has just escaped, and the fox strikes the exact pose I had seen so fleetingly. Genius manifests itself in unexpected ways. Audubon's powers of observation were phenomenal, and so was his art. Give genius a chance, and mere talent is silenced.

Once Audubon—and his sons Victor and John Woodhouse—had showed the way, there were many other artists waiting in the wings. John Gould in England was one person who immediately understood the potential in publishing animal and bird art in this new form. He himself rarely completed a painting although surviving sketches and watercolours indicate that he possessed a fair amount of talent. Rather, he engaged the services of others, including his wife Elizabeth and artists such as Edward Lear of *The Owl and the Pussycat* fame. Hart and Richter were two more of the artists who worked for Gould. Altogether Gould published 40 folio volumes containing 2,999 hand-coloured lithographs which, for quality and consistency, constitute the most ambitious publishing venture undertaken during Victorian times.

The greatest of the artists who worked for Gould was Joseph Wolf, known in his day as "peerless," "impeccable" and by other similarly adulatory words. Wolf was only 20 when he did his famous portraits of falcons for *A Treatise on Falconry,* before emigrating from Germany to England. By the time he died in 1899 he had completed thousands of paintings and sketches, none of which were more beautiful than those done for Daniel Giraud Elliot's monographs of the *Pheasants, Birds of Paradise,* and *The Cat Family,* considered by many today to be the most sumptuous books of all time.

The finished plates were hand-coloured lithographs that had been translated onto stone from Wolf's original charcoal sketches by two other artists, Joseph Smit and John Keulemans. From the artistic point of view, these sketches far exceed the final product, because they bring you face to face with that once-in-a-lifetime microsecond when the artist sees and experiences nature. You share

his reactions before he has a chance to go back into the studio to polish, change, edit and thereby lose the magic of the moment.

In Wolf, art and science were finally reconciled. The artistic approach was carried on by younger men such as Keulemans who, during a working career that spanned 50 years, produced more than 30,000 paintings and drawings of remarkable quality. But Keulemans was the sunset of the Victorian style. He overlapped with a newcomer, Archibald Thorburn, who can be called the first of the truly modern painters. In his early paintings for Lord Lilford's *Coloured Figures of the Birds of the British Islands* (1885 to 1897), we find for the first time an understanding of the role of light. Thorburn saw reflection and refraction and light diffused by differing atmospheres. He also understood how birds flew and floated, and how they interacted with gravity. He built up his paintings in planes of perspective that started at the viewer's feet, so that the viewer became a participant in the painting, not merely an observer. In Thorburn's paintings the animals owe nothing to man. There are no cooks, farmers, hunters or sportsmen. There are only animals for their own sake. Perhaps this signaled a new degree of maturity in our civilization.

As animal art concentrated less on man and more on animals, the vast majority of works came from artists whose mother tongues were not Romance languages. The French, Italians, Spaniards and Portuguese did not paint wildlife. This strange fact may in part be accounted for by a parallel lack in any of their languages of a word for "wilderness." Each has a phrase or two that defines part of the concept, but nothing that is all-embracing. No single word comes down from the time when wilderness still existed in the Mediterranean world. Statistically, out of all proportion to their populations, the greatest animal painters have come from Northern countries: England, Scotland, Germany, Holland, Canada, the United States and Scandinavia. In fact, the greatest animal painter of all was Bruno Liljefors of Sweden, and in my opinion the finest bird painter was a Swiss, Leo-Paul Robert.

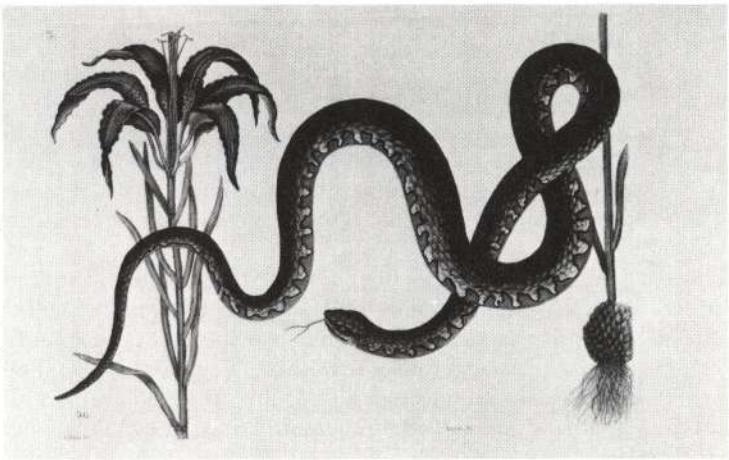
As unbelievable as Robert's bird paintings were, he always claimed that his greatest masterpieces were the 500 life-sized portraits of the caterpillars of his native Jura Mountains. Just as Catesby's snakes proved two centuries earlier, Robert's caterpillars emphasize how we tend to be species-oriented rather than art-oriented.

For centuries, animals in art played a subservient role and, within the total framework of art, animal art—or more accurately, animals in art—did not constitute a very large proportion. In fact, a case can be made for surprise as to how much there was, given the lingering prejudice of *Genesis* and the divinely bestowed "dominion." By the nineteenth century, quality and quantity of animal art took a quantum leap forward. Who were these people to whom we owe so much? I've described some, but many remain anonymous. In 1834, in Edinburgh, there appeared the first volume of *The Naturalist's Library*, an encyclopedic work that would span a decade and consist of 40 volumes. There were over 1,700 hand-coloured, copper engravings in each edition, and there were an

average of at least 5,000 copies of each volume. Simple mathematics shows that almost 50 million beautifully hand-coloured engravings were required for this one publishing venture alone. In one of the volumes there was an interesting publisher's advertisement which stated: "Altogether independent of the gratification which these plates have given to the public, the publication has opened up a source of agreeable, permanent, and profitable employment, to a very numerous class of most deserving and industrious persons in Edinburgh, whose rank in society and whose education precluded them from applying themselves readily to any other occupation than that of colouring." Men and women of towering genius have combined with the lowest of the low to bring us 400 years of animal art in books.

The importance of the development of animal art in books cannot be overestimated, as the chief repository of animal representation was found in the engravings and later the lithographs that accompanied a vast outpouring of books dealing with science, travel and sport. It has been rightly remarked that, until the popularization of the camera, more about science was learned through the sights of a gun than through any scientific instrument.

The patronage for wildlife books—even spectacular folios with hand-colored lithographed plates—was relatively widespread compared to the support given to wildlife paintings. It was only in 1874, after all, that the U.S. Congress finally authorized the unheard-of expenditure if $10,000 for a large painting of the Grand Canyon, by Thomas Moran, to hang in the Senate lobby. Even though it is dangerous to ascribe precise motives to the actions of others taken in other times, perhaps we can state that the Grand Canyon painting does mark a turning point in the official view of the importance of wilderness, and by extension, of wildlife. Since then the interest in and appreciation of wildlife and wilderness art has grown to the extraordinary levels they enjoy today.



© *Drawing by Catesby, ca. 1731*

CULTURAL CARRYING CAPACITY AND THE DEFENSE OF WILDERNESS

Garrett Hardin

Although environmental issues are steadily gaining support among economists, it is still true that our most vigorous opponents are found in the business and economics community. Even extreme statements of one's enemies should be taken seriously, because it is always possible that they may prevail. One of the strongest condemnations of wilderness lovers was made several years ago by one of President Reagan's most valued advisers. The wealthy industrialist Justin Dart, after admitting that he "loathed environmentalists," went on to say:

"I am for preservation. I say we should preserve the redwoods, sure, maybe 100 acres of them, just like the way God intended them, to show the kids. Those environmentalists who talk about preserving the wilderness in Alaska—how many goddamned bloody people will end up going there in the next 100 years to suck their thumbs and write poetry?"

In the academic world, unfriendly "growthmaniacs"—Herman Daly's term—may speak less colorfully but more effectively. Julian Simon and Herman Kahn have attacked one of the fundamental concepts of ecology in these words:

"Because of increases in knowledge, the earth's carrying capacity has been increasing throughout the decades and centuries and millenia to such an extent that the term carrying capacity has by now no useful meaning."

This statement raises several important points. The authors either deny—or do not understand—the centrality of the Malthusian model of population regulation. What Malthus asserted can be cast in the modern language of cybernetics. The temperature of a room is kept nearly constant through the suppression of departures from the "set-point" by negative feedback. In a similar fashion a population of animals is normally kept near its set-point—which is determined by the carrying capacity of the territory—through the negative feedbacks of Malthus's "misery and vice" (on the upside) and excess reproduction (on the downside). The logical entity that accomplishes this equilibration is called a *demostat*.

Most criticisms of Malthus rest on his failure to realize that the demostatic set-point was being moved upward in his day by technological advances in the production of food and other necessities of life. In our analogy, we would say that the temperature of a room was thermostatically controlled even if an unseen hand were to slowly turn the set-point to a higher level. So also is population demostatically controlled even when the set-point undergoes a slow secular drift (due to technology or whatever).

Malthus was not alone in failing to see the significance of technology. At its beginning, every historical trend is hard to see. Recall that the Renaissance in Europe was not named until four centuries after it started. All we have to do to make Malthus up-to-date is this: add the possibility of secular drift to the implied demostatic set-point.

Modern economic theory is such that economists experience difficulty in taking time seriously if it extends farther than five years into the future. Communist leaders and capitalist planners both find five-year plans adequate for most of the challenges that face them. Economists who say that Malthusian theory is useless because the set-point has risen for two centuries thereby reveal deficient imaginations. Human beings have been on this earth for at least a million years. During most of this time the change in set-point has been imperceptible during a single human lifetime. Not so, during the last 200 years.

But what are two centuries out of 10,000? No more than a "blip" in a curve. We hope that the human future will extend for at least another 10,000 centuries. If it does, what is the chance that the earth's carrying capacity will increase for 10,000 centuries as it has during the mere two centuries of the immediate past? *Zero*. There is not material enough, energy enough, or enough elbow room on earth to nourish forever the compound interest growth of technology of the past two centuries. (Migration into space is another matter, suitable for contemplation by those who believe in "Star Wars." In any case, this possibility won' t help whatever human beings are left behind on earth.)

Some economists seem not to know that every rigorous science must be built on a foundation of conservation principles. Too many economists are like Dickens' Mr. Micawber in believing that "Something will turn up." Their childlike faith in the power of future technology justifies (they think) their walking away from the work of paying attention to the foundations of political economy. The economists' "trickle-down" hypothesis holds that no one need be concerned with distribution problems because riches will automatically cascade down from rich to poor. This seductive hypothesis is not part of technology, it is not part of science and it is not a proper part of political economy. It is a religious belief (and a very convenient one for those in power).

The belief that carrying capacity is a meaningless concept is equally convenient, but we cannot let economists get away with such an assertion. The concept of carrying capacity is as basic to ecology as is the conservation of energy to physics. Let's see what carrying capacity means when it is applied to animal populations.

The carrying capacity of a territory is that number of animals that can be supported year after year without degradation of the environment—that is, without lowering the carrying capacity. Because capacity is subject to both seasonal and secular variations, the carrying capacity figure adopted must, in practice, be the lowest in the time series; or, that failing, massive die-offs will take place whenever capacity takes a downward turn.

When we turn to populations of *Homo sapiens*, capacity theory needs to be

elaborated. In 1967, the economist Colin Clark concluded that "the full support of one person requires the continuous cultivation of an area no larger than 27 square meters [of agricultural land]." Estimating the ultimate extent of the earth's agricultural land at 9.33 billion hectares, Clark concluded that earth could support 346 billion people. Wherever there is today a single human being, in Clark's Brave New World 69 human beings would ultimately have to be accommodated.

Are we, then, to say that the carrying capacity of the earth is 346,000,000,000 people? Only if we are reconciled to the thought of restricting *everybody* to the minimum number of calories required for the barest of living. No automobiles, no airplanes, no movie theaters, no sports arenas, no museums, no orchestras, no universities and perhaps no schools of any sort. Amenities that are conspicuous squanderers of energy would be forbidden: meat, baked food (boiling is more efficient), all sports and all vacation trips. Even complaining would have to be forbidden—it, too, "wastes" energy. Each adult would be held to a maximum daily consumption of 2,300 calories.

If you want a view of what such a world would be like, go to Bangladesh, where energy consumption is less than the present American standard by a factor of 140, in round numbers.

Now we see a good reason for being wary of "carrying capacity," but it is not the economists' reason. The concept is not meaningless; on the contrary, it has too many possible meanings. Calculations of the carrying capacity of the earth are necessarily based on the level of amenities assumed, whether stated explicitly or not. Focusing merely on energy, we note that Americans use 100 times as much energy as they need for the barest living—some 2,300 calories of energy per person per day.

Energy is a convenient yardstick of living, but it does not give the whole measure. A growing proportion of the population realizes there are real human values to be imputted to uncrowded beaches, to wild rivers, to the odor of pine forests unmixed with the effluvia of industry and automobiles, to extensive and lonely wilderness, and to all of the arts. Though the cost of such goods might be stated as energy production foregone, this approach hardly seems adequate.

We are deeply concerned with the values of the culture, where "culture" is used in the anthropologist's sense to include all the things, both material and immaterial, that are significant elements in the life of a people. If we want to make a meaningful assay of the potentials of our earth, we must replace the simple concept of carrying capacity by the richer concept of *cultural carrying capacity*. The semantic change does not automatically give us the answer to our problem; it reminds us that there can be no answer without an agreement on values, on standard of living, on "the quality of life."

Bluntly put: whenever someone asks you for the carrying capacity of the earth, the United States, or whatever, you must, at the outset, refuse to give an answer. You must convert the question into an inquiry into values. Most social scientists (including most economists) evade value questions, hoping thereby to

make their disciplines more "scientific." But without values, explicit or implicit, what use are social studies? (Whether the studies are to be called sciences or not is a definitional issue.)

Cultural carrying capacity is inversely related to the richness of the culture.

What then are the consequences when different nations adopt different standards of living? Many idealists regard national boundaries as indefensibly arbitrary; they hope to weld the many nations into "One World" that lives by Marx's ideal of "From each according to his ability, to each according to his needs!" Even in 1875, when Karl Marx first coined this slogan, the ideal could not be successfully defended, because of a fundamental analysis carried out almost half a century earlier by William Forster Lloyd. But the significance of Lloyd's work was not realized until 1968.

Now we know that a global Marxist sharing according to need will produce universal impoverishment. Just as free competition among different forms of money results in bad money driving out good money, so will free competition between different living standards (if need is the paramount consideration in distribution) produce a Gresham's Law of the Environment: Low living standards will drive out high standards. In a truly Marxist distribution, ultimately all grades of cultural carrying capacity become irrelevant, as the barest form of "carrying capacity" determines the outcome. Turn all the means of subsistence into common property and a "tragedy of the commons" is set into motion.

I am not sure that we who love wilderness appreciate fully the difficulties facing us. It is easy to perceive the threat of commercial greed, in such statements as the one quoted earlier from a Reagan adviser. It is much harder to recognize the latent dangers of idealism. Yet history presents us with minatory examples that should give us pause.

The growth of concern for animal welfare and the rise of the concept of the "sanctity of (human) life" in the eighteenth and nineteenth century may have seemed innocent enough in the beginning. But today we reap the unforeseen harvest of these idealistic movements. Medical research facilities are now being "trashed" by self-styled animal lovers who are made furious by the use of dogs and cats in experiments. Birth control clinics dedicated to improving the lives of women are bombed by "Right-to-Lifers." Both kinds of violence are carried out by people who express the most elevated concern for life.

What about wilderness? Is it possible that we may some day encounter a kind of idealism that threatens the preservation of wilderness? I think it is possible. The idealists who pose the greatest threat to the preservation of wilderness are those who most eloquently put forward *equality of distribution* as a paramount good.

Like so many other ideals, this one also dates back to the eighteenth century. In 1796 the radical French revolutionist who called himself Gracchus Babeuf published a *Manifesto of the Equals*, in which the following significant passage occurs:

"We henceforth intend to live and to die equal, just as we were born; we want

real equality or death, that is what we need. And we shall have it, this real equality, no matter what the price. . . . Woe to anyone who would offer resistance to so keen a desire!. . .may all the arts be destroyed, if need be, as long as we have real equality."

Within nations, and between nations, those who place a Marxist distribution according to need at the pinnacle of the ethical system are following in the footsteps of Babeuf. It will be a sad day for wilderness if society adopts the Babeuvian idea, May all art and beauty be destroyed, if need be, to achieve equality of distribution.

Wilderness can be preserved only by explicitly asserting that equality of distribution, desirable though it may seem, must not be made the paramount goal of society. If we are deeply concerned with the well-being of our descendants, our paramount goal must be the acceptance of a level of cultural carrying capacity that includes "all the arts" and such precious amenities of life as wilderness.

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WILDERNESS AND HUMAN POTENTIAL

HOW WILDERNESS FACILITATES PERSONAL GROWTH

John C. Hendee and Michael Brown

The general notion is that in the wilderness you can learn about yourself, your companions and nature. In wilderness, away from the social intensity and distractions of daily life, participants test themselves, heighten self-confidence and esteem, clarify their identity and personal values and address the central issues in their lives. While in such environments and while benefiting from awareness, plans to change troublesome behavior can be laid and patterns redirected toward more inspired purposes.

How do programmed wilderness experiences facilitate personal growth? When and under what conditions is it most likely to occur? How much is possible? What is the right mix of hard skills, such as rock climbing, and soft skills, such as group dynamics, exercises and solo time? Can experiences be prescribed to produce desired results? Can we, as practitioners and proponents of the use of wilderness for personal growth, therapy and education, synthesize collective evidence from studies into a practical conceptual framework?

Scores of studies have been conducted on wilderness experience programs to determine their effect on participants. Hundreds of investigative and popular articles have been written about wilderness adventure programming and outdoor leadership, and courses are offered at many universities. Scientifically, one can conclude from the research evidence that many wilderness programs yield small but significant increases in self-esteem, improved self-concept, a shift in locus of control from external to internal and heightened self-awareness among some participants.

Despite several analyses of the experiential process, there are not yet agreed-upon principles to guide the training of instructors and practitioners in the use of wilderness for personal growth, therapy and education. Neither is there any agreed upon theory, model or framework to guide further research or program design.

This paper offers a conceptual model that synthesizes previous research, personal experience and years of dialogue with instructors of wilderness programs, their participants and other wilderness users.

Our goals in developing this theoretical model are: to create a useful tool incorporating previous research and experience to help practitioners improve their programs and train instructors; to focus additional research; to help users understand how to use the wilderness for their own greater inspiration and benefit; and, to increase understanding by resource managers about how the natural environments they manage can contribute to the development of human resources.

PERSONAL GROWTH

First, some definitions and assumptions: By personal growth, we mean a range of effects toward expanded fulfillment of one's capabilities and potential. We see a continuum of personal growth outcomes ranging from insight at the low end of the spectrum, clarified purpose in the middle, to transformation or redirection of one's life on the high end.

We define growth motivation as including all motive patterns which aim toward personal development and self-actualization. For example, personal growth begins with an increased awareness of one's desires, abilities and values, which makes possible the satisfaction of needs and the achievement of goals that are important and different for each individual. For some it may be more power and possessions; for others it may be enhanced love and relatedness to humanity. But many people may also be struggling with deficiency needs such as dependency, low self-esteem, a poor sense of identity, or a lack of direction or self-confidence.

Postulate 1

Personal growth depends on receptivity: Personal growth from a wilderness experience depends on the participants' receptivity. Do they want to go? What are their incentives to participate? Are they ready to change? Readiness for

change may depend on conditions preceding the experience which affect one's motivation to grow or change, and also one's stage in life. For example, people struggling with deficiency needs or those who are already striving toward self-improvement are likely to be more receptive to personal growth. So are people in transition from one life stage to another, such as from adolescence to adulthood, mature adult to middle age, from illness to health, from marriage to divorce. Likewise, people coping with change or emotional trauma—such as a new job or the loss of a loved one—are good candidates for personal growth and can benefit from clarified values and heightened self-esteem which may stimulate renewed direction and meaning for their lives.

We believe that one cause of clouded results in the hundreds of studies of participants in wilderness programs is that they include persons who are not in a receptive mode. Such studies include participants along the whole continuum of growth motivation, including persons who are comfortable in a steady state period of adjustment and not motivated to explore themselves. Others may be in a stage of denial which often precedes growth and would cause them to resist a process of change. Unreceptive participants are not likely to experience growth.

Postulate 2

Personal growth depends on optimum stress from the experience: Personal growth depends on the right degree of stress from the wilderness experience—physically and emotionally—and this threshold will vary with the physical condition and previous experience of each individual.

Natural environment experiences are diverse in their intensity, from gentle hikes near town to wilderness experiences requiring rigorous and skillful physical activity like backpacking or technical rock climbing. Stress comes from dealing with the rigors, discomfort, danger and uncertainty of outdoor experiences. A sudden snowstorm can turn a day-hike into a survival situation. The stress is physical and psychological, as anyone knows who has gritted his teeth with determination to fight pain and fatigue those last few miles back to camp at the end of a hard day. With extreme physical stress may come psychological breakdown as anyone knows who has unravelled wilderness disasters where the difference between death and survival was panic and illogical decisions.

There is wide belief that the greater the natural environment intensity, and the harder it is to access and enjoy the environment, the greater the potential for personal growth.(No pain, no gain!) It is thought that the more natural, primitive and remote the setting and camping style, the greater the likelihood for personal growth to occur.

But this is not necessarily true. There are limits, and each person has his or her own unique threshold of tolerance for intensity of contact with the natural environment which must not be crossed if the experience is to be positive and productive. Beyond a certain point, the individual may become overwhelmed by the challenge, demands, uncertainty or dangers, and then the experience can "short circuit" with negative results. Excessive stress may trigger a whiplash ef-

fect. For example, too much stress may provoke uncontrolled emotional release beyond a constructive threshold and result in denial, repression of exposed weaknesses and mobilization of defenses—a regressive rather than a progressive growth effect. Furthermore, excessive stress once survived can lead some to inflated ego and self-aggrandizement—a survivalist effect that can produce a macho or authoritarian attitude and self-concept that will thwart cooperation.

Prescribing the right degree of environmental intensity is thus extremely important and will vary depending on individual differences. Some things to consider are willingness to risk, personal growth motivation and needs, physical health, previous outdoor experience and skill, responsibility and maturity, the psychological readiness or receptivity or the goal orientation of the participants, and the individual or group outcomes desired.

The purpose is to create just enough stress with which the individual can successfully cope, but enough to also bring core behavior and psychological patterns into awareness where they can be identified, clarified, evaluated and redirected if desired.

Postulate 3

Wilderness experiences provide change and attunement: Wilderness experiences provide a reprieve from cultural influences, external constraints and stimuli, providing a change of pace and the opportunity for attunement to oneself and the immediate environment. For many people whose lives are intense, an immediate effect may be a slowing down. For others, the effect may be liberation from the external forces that govern their daily lives.

With this liberation from the patterns of our daily lives, latent feelings, emotions and physiological functions may emerge. New perspectives may evolve. Enhanced potential for insight and a sense of renewal may follow as core patterns of behavior and values are viewed from a new perspective.

In wilderness, attuning to ourselves and the natural world, we can experience the functions of the right side of the brain. We can relax, slow down and access higher levels of awareness, imagination, intuition, creativity, empathy, and insight and enjoy the energies these functions deliver: awe,wonder, hope, inspiration and vision that connect us to a sense of the values, meaning, purpose and density in our lives. In the wilderness, we can experience, once again, the true significance of our lives in the natural order. This experience, of seeing ourselves in true perspective, both humbles and empowers us.

Postulate 4

Wilderness provides metaphors. Wilderness activities can provide metaphors to strengthen desirable qualities for application back home. The most simple metaphor may come from success in dealing with stress from the environmental intensity of experience and discovering previously untapped resources and a sense of accomplishment. This is why optimum stress from the environment is so important to provide challenge, but allow for successful coping.

The opportunities for metaphors are diverse using programmed activities which may reveal and allow development of native abilities of leadership, creativity, enhanced reasoning and problem-solving, communication, cooperation and teamwork, trust, delegation and negotiation. Metaphors provide new ways of seeing reality and the opportunity to reframe old ways of doing things. For example, the cooperation and teamwork required to get a squad over a 12-foot wall. Trust is required to be lowered on a rope in a rock climbing and rapelling exercise. Group dynamics exercise may require communication, cooperation and negotiation. Visualization exercises, enriched and stimulated by the natural environment, can provide a blueprint for growth in new self-concepts: for example, I am like an oak tree with deep roots and strong branches, I am like the river, with greater depth when moving steady and gently than when rushing wide but shallow. Encouraging these images can shape and guide behavior, inspire effort and build self-esteem.

HOW THE WILDERNESS WORKS: FOUR HYPOTHESES

How do wilderness experiences facilitate personal growth? The foregoing postulates are assumed to be true but, of course, each one provides a focus for additional research. They are important, because if we can isolate and understand the processes and conditions which enhance opportunities for personal growth from wilderness experiences, then we can more effectively prescribe experiences, conditions and programmed activities to maximize growth potential. These postulates lead us to four additional ideas or hypotheses about how wilderness experience can lead to personal growth that are both sequential and interrelated. They assert that wilderness experiences can lead to (1) increased per-sonal awareness, leading to (2) a threshold of growth motivation or what could be called one's growing edge, (3) which in turn can result in increased social awareness. All of these states are enhanced by the primal influences of wilderness and the experiencing of ourselves in true humility to the natural world.

1. *Personal awareness*—Wilderness experiences can reveal core patterns of personal behavior, values, emotions, fears, drives and tendencies, thus fostering heightened self-awareness, a first step toward personal growth. When we begin a wilderness experience we bring with us our worries, anxieties and concerns, and usually have had to forcefully carve out time for the trip from the overwhelming fullness of our lives. Our minds and bodies want to slow down and relax even as our spirits want to soar. It takes a while to shuck worries, tensions, concerns and fatigue, and even longer to throw off the patterns that drive us in our daily lives. One of the principle values of outdoor experiences is the opportunity it provides to notice just how patterned we really are.

The wilderness environment provides a mirror with which to see reflections of our inner worlds. We are uncomfortable when our normal patterns do not work, or when they stand out in stark contrast in a new and unstructured setting, and this discomfort heightens our awareness. The novelty of the wilderness experience strips us of the normal social basis for personal identity and provides

many opportunities for acute personal awareness. In the absence of our masks, roles and other social mechanisms for dealing with one another, we must confront ourselves. We can develop insight and glean new perspectives about who we really are inside.

Why does this occur in wilderness? Because it is so far removed from the influences of our daily life. Our patterns, values and beliefs emerge in bold relief. They become clear to us and our companions. We cannot blame troubling patterns in the outdoors on our partners, boss, kids, parents, society. We are the authors of our wilderness experience and by example we may come to learn that we are also the primary authors of our lives back home. Such heightened personal awareness is often an uncomfortable revelation, but it is often quite liberating, too. Heightened awareness is the first step on a path toward change.

2. *Growing edge*—Wilderness and outdoor experiences, by heightening personal awareness of core patterns, beliefs and values, place the participant at a growing edge where these personal qualities can be evaluated and change can be initiated if desired. The wilderness experience provides space for something new to happen. If unconscious patterns and values become clear, it can lead to important questions: Is there a better way? What is the meaning of my life? What goals should I pursue? What's worth living for, what's worth dying for? Simply stated, the growing-edge hypothesis asserts that as personal awareness is heightened under the stress of coping with the outdoors, core patterns will become clear and be available for evolution and potential change.

It is possible to go into the wilderness and simply replicate our standard patterns and routines. The hard-driving business executive may go with his son and hike 15 miles a day, carrying 65 pounds of gear. The immature young adult may go with his friends for a weekend beer party and leave beer cans strewn along the trail. People seek escape from the unhappiness of their lives and use the outdoors as a space simply to get away, with no intention of confronting their inner selves. In fact, many outdoor enthusiasts adamantly resist combining outdoor recreation with programmed activities in search of personal growth. It would spoil the fun! Such participants may be unreceptive to the personal growth opportunities of programmed wilderness experiences.

We assert that outdoor environments, even on these terms, provide unique space for nurturing the growth of the human spirit. The 15-mile-a-day executive may have no other forum with which to reach his son. The young adult is asserting his independence, testing his new wings and beginning to claim life for himself. If he finds part of himself in the wilderness, he may return to search for more. Conservation and environmental ethics will hopefully be learned along the way. Unhappy people can find a certain peace and calm, and enjoy the quieting effect of wilderness and the much needed change of pace and opportunity for attunement. Values have a way of getting clear, almost by themselves, in the company of solitude and silence.

Participants in a receptive mood, experiencing a proper degree of environment intensity, liberated from their normal routines and enjoying a much

needed change of pace and the opportunity for attunement, may find their growing edge even without the help of programmed activities directed toward self-discovery.

3. *Social Awareness*—Wilderness experiences in groups reveal individual patterns of social interaction that can then be evaluated. New patterns can be shaped and learned if desired.

Every wilderness group is composed of unique individuals who are required to interact for the duration of their trip. If strangers, they will be without the customary social identity of their daily life. Each unconsciously brings his or her patterns, defenses, masks and roles. But then each may begin to slow down, to relax, to tune in to the environment and to themselves. In the outdoors people begin to socialize in remarkably different ways. Status differences dissolve, stories are told, secrets are revealed, pains are shared, new alliances and friendships are formed, existing friendships or family bonds can be strengthened.

Unshielded by status and other conventional social bases for identity, we have many opportunities to see ourselves as others do, see into others like never before, and recognize and appreciate our common human condition. In wilderness, enhanced trust among interdependent companions can reduce the risk of self-disclosure, and patterns of social interaction that are functional, effective and inspired can be developed and shared. With participants moving toward heightened self-awareness and their growing edge, new and more effective patterns of social interaction can be cultivated, tested and learned.

4. *The primal experience*—Wilderness experiences directly expose participants to the primal influences of nature and the elements, which foster a sense of humility in relation to the natural world. The exposure to primal influences distinguishes the wilderness as an extraordinary place for personal growth compared to other locations such as a playground, counseling center, classroom or retreat facility.

In wilderness we must pay close attention to what is going on around us and continually adapt and respond to changing circumstances. Our awareness must return to the basics, to the essentials, to the primal truths of existence. We confront the natural world and sense its indifference to us, regardless of our social status back home. We feel relatively insignificant in the face of nature's awesome power, the perfect antidote for a self-absorbed ego. We learn we must be responsible for ourselves and for each other, in ways that are immediate and direct, for ultimately there can be lives at stake. We must pay the price for any mistake. We see ourselves more clearly under such conditions, and we may be both humbled and inspired by the beauty and power of the natural world.

Dealing with the natural world in a direct and unmediated way allows basic levels of awareness to be activated. Structures of perception and ways of knowing that lie below the ego and the personality are activated. We experience an awareness that is fully present to the moment. We remember with our bodies and souls the ancient language of survival. This is how the creatures in the wilderness survive, responding naturally to life and the threat of death.

This, too, is our potential: to experience the world in a primal, immediate undistorted way. For a moment we take our rightful place beside the creatures of the wild. Our original selves reemerge, long buried beneath the artificial constructs and patterns of society and culture. We sense the mystery of the natural world. We are a part of the timeless dance of life and an expression of its mystery. This is the real meaning of recreation and renewal: to be reborn with renewed perspective about who and what we are. Such moments of realization are extraordinary when they happen, are never forgotten, and are moments upon which lives of integrity and meaning can be built.

The model presented here is a guide to how wilderness experiences can work for personal growth. We hope and expect that the model will be a focus of debate that will generate additional ideas and inspire future research. In the meantime, it provides a valuable framework to guide: (1) the design of wilderness programs to increase their potential for leading to personal growth, (2) the instruction of wilderness program leaders in concepts and processes effective in increasing the growth potential of wilderness program participants, (3) wilderness visitors toward more enriching experiences. The model can also increase the understanding of wilderness managers so that they can better protect wilderness for personal growth and the development of human potential.

APPLYING THE MODEL

These ideas are presented in a scientific framework of postulates and hypotheses. Let us tell you more directly how they might be applied to increase the personal growth potential of wilderness experiences.

First, diagnose and cultivate receptivity to personal growth and change. It is unrealistic to think that maximum growth is possible among random participants merely by running them through a wilderness program.

Second, create the right degree of stress through program activities and contact with natural environment. The objective is not to break individuals down but to bring each of them to their growing edge by creating optimum stress for each individual. Recognize that the tolerance for stress of each individual is different and that proper challenge for one may be too much for another. A balance is needed between hard activities like rock climbing and soft activities like introspective exercises and group dynamics. In the final analysis what the wilderness location and outdoor activities really do is set the stage for something introspective to occur.

Third, to take full advantage of the new environment and activities in wilderness, time and encouragement are needed for attunement to oneself, the group and the natural environment. There must be time and activities that encourage personal reflection, social interaction among group members and communion with nature. This focus on reflection, social activity and environmental interaction may be most effective if gradual at first and then in increasing depth.

In conclusion, the model suggests that optimizing the personal growth

potential of wilderness programs depends on: receptive candidates who are ready for change; optimum stress from contact with the natural environment and a balance of hard and soft activities; a sufficient change for attunement to oneself, the group and the environment while in the wilderness and away from daily routines and roles; and, the conscious use of metaphors from the wilderness experience and program activities. The goal is to allow core patterns, feelings, beliefs, values and social interaction to emerge, and to use this heightened state of personal and social awareness to bring one to a growing edge where one's behavior can be understood, addressed, evaluated and affirmed or redirected.

Finally, the model suggests, and we firmly believe, that these goals are facilitated by the primal influences of wilderness that allow participants to see themselves in their true perspective to the natural world—a view and realization that is humbling, inspiring and empowering.

THE WILDERNESS LEADERSHIP SCHOOL

Ian Player and Wayne Elliot

The idea of the Wilderness Leaderhip School was conceived in 1957 when I was a game ranger stationed at Lake St. Lucia, a reserve under the control of the Natal Parks Board. A group of six schoolboys from my old school, St. John's College, was visiting the lake reserve and accompanied the game guards and me on patrol. The schoolboys' wilderness experience amongst the hippo, crocodile, flamingoes and pelicans and the coastal dune forests inspired a response that has become common to participants and a refrain Wilderness Leadership School trails since: "This experience changed my life."

The beginnings of the Wilderness Leadership School are founded in the steadfast belief that the future of mankind lay in an informed public—particularly people in leaderhsip positions—who will lead others to appreciate the necessity to conserve the natural resources of our planet, particularly the wilderness areas. The original objective of the Wilderness Leadership School was: "To enable people to go into the wilderness and wild places of southern Africa, under experienced guidance, in order to gain understanding of and to receive instruction in the conservation of natural resources, of nature and of wilderness."

The Wilderness Leadership School continues to believe that the leaders of today are mankind's most precious resource, and that they can be strengthened in spirit, mind, body and character by a wilderness experience. The school allows people the opportunity to experience firsthand not only the important role wilderness areas play in maintaining a healthy, vigorous world, but also to understand the relationship between the environment and human nature.

The symbol of the Wilderness Leadership School since inception has been the *Erythrina caffra* leaf chosen by Magqubu Ntombela. The three points of the leaf represent "Man to God, Man to Man, Man to Soil," the fundamental philosophy of the school.

More than 10,000 people from many countries have now experienced the trail with the Wilderness Leadership School. As a result, the school has become a vital part of an international movement and is able to influence conservation policy decisions.

The Wilderness Leadership School employs four full-time field officers who conduct the trails, two in the Province of the Transvaal and two in Natal. There is a volunteer staff of 25 field officers in engineering, architecture, building industry and others too numerous to mention. These volunteers perform a most valuable function by conducting weekend trails for interested members of the public who are only able to be away for two days instead of the normal five. The volunteers have been highly trained by the professional staff. They are unpaid and are able to expand the work of the school without being a financial drain. Plans are under way to train volunteer field officers in the Province of Natal. A branch has been formed in the Cape Province where experimental trails are being conducted by a psychiatrist with patients from a local hospital. There is strong belief that the wilderness has powerful therapeutic properties which can assist in the healing of the mentally ill.

Financially the school receives one-third of its income through trail fees and the remainder in donations from commerce, industry and individuals in South Africa, and from conservation organizations in the United States, including the International World Leadership Foundation. The IWLF has made it possible for many young American leaders to participate on Wilderness Leadership School trails through the provision of scholarships. The IWLF has also sponsored the four World Wilderness Congresses.

A review of the Wilderness Leadership School's activities over the last 30 years shows that the school provides two kinds of experience. First, it gives all the people of South Africa—irrespective of race, colour or creed—as well as visitors from overseas, the opportunity to experience the wilderness, to feel the rhythm of Africa, so aptly described by Jan Smuts, who wrote the following in 1929:

"The mysterious eerie spirit which broods over its vast solitude, where no human pressure is felt, where the human element, indeed, shrinks into utter insignificance and where a subtle spirit, much older than the human spirit, grips you and subdues you and makes you one with itself."

This is achieved by walking through the wilderness areas of South Africa like the Umfolozi game reserve and Lake St. Lucia reserve and areas in Northern Jululand adminsitered by the KwaZulu Bureau of Natural Resources. The Pilanesberg National Park and the Borakalalo National Park in the independent homeland of Bophutatswana are also used. The walking is done at a leisurely pace, each trailist carrying his own backpack and food for the trail. Encounters with the large mammals of Africa—black rhino, lion, Cape buffalo and white rhino—heighten the experience. Canoeing amongst the hippo and crocodile adds the spice of physical danger which heightens the awareness of the trailist. The scream of the African fish eagle in the early mornings and the sound of nocturnal predators and birds make campfire talk a special experience. All trailists are expected to keep watch alone for at least an hour each night, and this is the time for introspection.

Second, and depending upon the knowledge of the field officer, trailists can become aware that there is an inner wilderness—a personal, often unconscious, reality from which springs our personality and our actions. By allowing nature to become the teacher, there is a realization of the inward journey toward the self as understood in Jungian psychology.

The dreams of those participants sleeping on the African earth for the first time are often revelations that lead the dreamers to a better understanding of their own personal inner and outer states. Through knowing themselves better by a wilderness experience, they become more aware of their fellow men. And they learn the importance of wilderness to the continued existence of mankind. The wilderness enables them to be free, albeit for only a short while, from the technologically controlled lifestyle of the modern world and man's dominating attitude toward nature. The trailists are brought back to their aboriginal fears and become watchful, humbled and, importantly, awed by nature. The spark to tread the inner and outer paths toward wholeness can come from the wilderness experience. Many participants are deeply moved to a state beyond words by the darkness of a moonless African night, the penetrating silence, the solitude, the presence of the unknown and unseen, the crossing of a river in the presence of crocodiles, the fresh track of a lion in the mud, the weird call of the hyena and the comfort of a campfire.

Professor C.A. Meier, a Jungian analyst, in a paper entitled "Wilderness and the Search for the Soul of Modern Man," presented at the 3rd World Wilderness Congress (Scotland), noted the importance of a balance between the inner wilderness and the outer wilderness. Professor Meier states the wilderness within would go wild if one should badly damage the outer wilderness. The great dangers facing modern man will continue until man appreciates that his continued well-being lies in the understanding of the natural world and the rhythms of our planet.

To this end the Wilderness Leadership School continues to work.

WILDERNESS VISION QUEST

Michael Brown

> "Climb the mountains and get their good tidings. Nature's peace will flow into you as sunshine flows into trees. The winds will blow their own freshness into you and the storms their energy, while cares will drop off like autumn leaves."
>
> —John Muir

> "I went to the woods because I wished to live deliberately, to confront only the essential facts of life, and see if I could not learn what it had to teach, and not, when I came to die, discover that I had not lived."
>
> —Henry David Thoreau

Let's take a trip into the high country of concepts and ideas and talk about *how* we can connect with the peace, freshness and energy that Muir speaks of. Like Thoreau, let's deliberately confront some essential facts about how we can explicitly use our wilderness experiences for personal and spiritual growth.

I would like to share some of the latest research on how the brain works and talk about how we need to balance adventure-related activities with inner-directed processes to get the most out of our experiences in nature. I would like to introduce the field of transpersonal psychology, talk about the rituals, ceremonies and rites of passage people have used throughout time to provoke transformative experiences in nature, and I will discuss some specific methods we can use to enjoy a much more profound contact with the natural world.

As a human resources consultant living in Washington, D.C., I conduct a wide variety of innovative training programs for public, private and governmental organizations throughout North America. My primary commitment is to help people develop their latent human resources so that they can participate most fully in the joy of living. My expertise involves the development of creativity and the process of self-actualization.

Twenty percent of my work takes place in wilderness and back-country settings, on a retreat program I call the Wilderness Vision Quest. Since 1976, I have led more than 600 people on outdoor retreats which, at various times, have involved backpacking, trail rides, ropes courses, canoe trips and other adventures in nature. This is a small program, in comparison to those of Outward Bound, the National Outdoor Leadership School and the African Wilderness Leadership School. The work I do with participants is intensely personal and I have always been the sole leader on these trips.

SPIRITUAL GROWTH

I believe it is time for us to speak openly, and with a clear voice, about the spiritual value of our experiences in the natural world. I believe it is time to acknowledge the fact that perhaps the highest use of wilderness is as a site for self-discovery, and for the exploration, enrichment, healing and growth of the human spirit.

Sigurd Olson, a prolific writer and one of the founders of The Wilderness Society, said that wilderness to the people of America is a spiritual necessity, an antidote to the high pressure of modern life, a means of regaining serenity and equilibrium.

Arthur Carhart, a Forest Service employee in the 1920s who helped lay the foundation for the National Wilderness Preservation System, said perhaps the rebuilding of the body and spirit is the greatest service derived from our forests, for of what worth are material things if we lose the character and the quality of the people who are the soul of America?

We have many needs when we enter the natural world. We need a change of pace from the routines of our daily lives. We need to release our constant, grinding, inner stress. We need to discover who we really are inside. We need to experience beauty, adventure, wonder and renewal. Nature has a tremendous impact on the human spirit, even if we are a bit reluctant to identify spiritual growth as the reason for or the end result of our trips into wild country.

TRANSFORMATION

Although our experiences in nature can be exciting, educational, meaningful, significant and touch us in many ways, they are not always transformative. It is about the process of transformation I wish to speak. There is a tremendous difference between recreation, stress management or adventure, on the one hand, and the life-changing experience of transformation on the other.

The concept of transformation is powerful and complex. It represents a complete change of being and a shift to a higher mode of operating. It implies the awakening of new levels of awareness; a fundamental resolution of the internal causes of stress; the discovery and clarification of essential values; the creation of new goals through which to manifest these values in the world; and the redirection of life energies toward a higher and more fulfilling purpose.

It is obvious that something very powerful must take place for real transformation to occur. Unfortunately, this does not always happen on our back-country trips. Our experiences may change us for a while, but our roles, masks and personality patterns too readily assert themselves again. Unhappily, much of the positive energy we generate on our outdoor adventures simply decays over time, and all too often only vague memories remain of the fun, difficult or exciting times we have had outdoors. How do we reach for, experience, or facilitate self-actualization or transformation on our wilderness and back-country trips? Where can we turn for guidance when trying to understand this process?

Important insights into the process of transformation are being discovered

these days in transpersonal psychology. Transpersonal psychology represents the cutting edge in psychological research today, exploring hidden dimensions of the human psyche and blazing new trails on the frontiers of human resource development.

In Latin, trans means "on the other side of," as implied in the words transatlantic or transcontinental; or "above and beyond" as implied in the word transcend. In Latin, persona means "mask." At the broadest level, then, transpersonal psychology seeks to help us:

1. Understand how to "get above or beyond" our personalities so we can see them clearly, understand their origins and dynamics, integrate their functions and transform them when possible;

2. Look "on the other side of" these roles, patterns and masks to discover what is hidden, blocked, defended, or unknown within us;

3. Develop new levels of awareness and latent human resources;

4. Consciously play roles in life that manifest our deepest values so that we can and bring into the world our best talents and abilities and thereby live meaningful, productive, wise and loving lives.

To accomplish these goals, transpersonal psychology investigates and explores the deepest realms of the human consciousness. It seeks to understand how extraordinary and unusual events impact and affect the human psyche—such events as the wilderness experience, profound grief, the near-death experience, altered states of consciousness, the use of psychedelic substances, meditation and yoga, psychic phenomena, trance and mystical states and other deviations from what are considered normal levels of awareness. Focused in the fields of education, therapy or organizational development, transpersonal psychology carefully employs specific methods and techniques to help us develop and enjoy the use of our most important human resources such as imagination, intuition, creativity, inspiration and insight. These methods and techniques will be discussed later. In its research, transpersonal psychology has discovered three important steps that must be honored in the transformative process: preparation, exploration and integration.

Transformation requires us to be willing to take off our masks and be ready to explore our inner depths. It requires us to be willing to experience ourselves in new ways (to face our fears, for instance; to release our emotions; to be touched by wonder; to have the primal forces of nature move powerfully through us). And transformation requires us to take responsibility for the new things we learn about ourselves and integrate our new insights and energy in daily life.

But what does all of this have to do with wilderness? Let's consider how the brain operates and look at what happens on wilderness and backcountry trips.

HOW THE BRAIN OPERATES

What does consciousness mean? Websters defines consciousness as the awareness of one's thoughts, feelings and impressions. But who, or what, is conscious? It is the self within us that is conscious and it is the brain that is the organ

of awareness. The brain is divided into two hemispheres, left and right, and recent neurophysiological research shows that each side of the brain has different functions.

Left Side of the Brain
Outer-Directed, Purposeful
Rational, Logical, Analytical
Will, Strength, Endurance

The left side of the brain helps us handle outer-directed activities and controls the rational, logical and analytical functions of the self. The left brain helps us perceive, understand and respond to realities in the world around us and helps us fulfill our chosen purpose. When stimulated, the left brain provides us with the energy required to achieve specific goals—energies such as will, strength, and endurance.

Most wilderness and backcountry programs single-mindedly stimulate the functions of the left side of the brain. "Hard" skills and technical abilities are needed to survive in the wilderness. Rock climbing, canoeing and cross country skiing, for instance, require a high degree of left brain activity.

Right Side of the Brain
Inner-Directed, Meaningful
Receptive, Intuitive, Symbolic
Compassion, Empathy, Love

The right side of the brain helps us handle inner-directed activities and connects us to the meaning dimension of life. It controls the receptive, intuitive and symbolic functions of the self. The right brain helps us perceive, understand and respond to the powerful dynamics within us. When stimulated, the right brain provides us with energies which enhance the quality of life such as compassion, empathy and love.

"Soft skills" such as relaxation, reflective writing, poetry, dream work, visualization, art, music, dance and mime turn on the functions of the right side of the brain. These methods can help us understand, find the meaning of and integrate the effects of our adventures in the world.

Balanced communication between the left and right sides of the brain results in a state called whole-brain thinking. To be powerfully transformative, wilderness treks must provide us with the opportunity to experience this whole-brain thinking. Far removed from the demands of civilization, wilderness is the perfect context in which to link the left brain (conscious personality or "I") with the right brain (unconscious functions through which the self communicates). Through this link we discover the meaning and purpose of our lives at any given moment. In wilderness we infuse our goal-oriented behavior with essential values and experience our full humanity, self-actualization!

Whole-Brain Thinking
Discovery of Meaning and Purpose
Goal-Oriented Behavior—Informed by Essential Values
Full Humanity

RITUALS, CEREMONIES AND RITES OF PASSAGE

Just to stretch our imaginations, let's consider some of the powerful ways people throughout time have employed to shut down the left brain, set aside their worldly concerns, turn on the right brain, develop the latent resources of the self and experience the unity that underlies creation. Special rituals, ceremonies and rites of passage have been developed since time immemorial to experience the regenerative effects of the transformative process.

For centuries in the Hindu and Buddhist traditions, people have gone to caves, mountaintops and other remote places to practice yoga, meditation and other spiritual disciplines directed toward the realization of the self. The history of Christianity is full of stories about people like Saint Francis and Saint Claire of Assisi—hermits, mystics and monks, who, through prayer, fasting and severe discipline have developed their spiritual potential. Aborigines in Australia undergo the rigors of a yearlong Walkabout as a rite of passage from adolescence to a mystical relationship with the world around them. Shamen in Siberia, through drumming and chanting, experience intense trance states and what is described as spirit flight, to understand and learn the secrets of the healing arts. The Huichol Indians in Mexico use the hallucinogenic peyote cactus in night-long spiritual ceremonies, then share the lessons they learn about themselves and creation by making beautiful yarn paintings. The Sioux, Cheyenne, Pawnee and other native people in North America prepare for spiritual ceremonies through the purifying heat of the sweat lodge. Some undergo rituals of severe physical stress and pain, such as the sun dance ceremony, to provoke altered states of consciousness, to discover that they are truly more than just their physical bodies and connect in a primal way to the Great Spirit of life. Many native Americans go on the vision quest: retreat alone in nature and fast from food, water or sleep for as long as four days to learn powerful lessons about the meaning and purpose of their lives.

These rituals, ceremonies and rites-of-passage are rigorous and demanding. They are always approached with reverence and are conducted or supervised by wise elders of the community with experience in using the methodology.

The exploration of consciousness is not as widely validated in our culture as it is, and has been, elsewhere. Few of us are willing to participate in such unusual or powerful experiences today. They seem irrelevant at best; dangerous and threatening at worst. We scoff at native and primitive practices while, at the same time, many of us are bored with our lives, lack enthusiasm and passion, only superficially interact with others and lack any sense of the meaning or purpose of our lives.

Few of us really know how to renew ourselves at the deepest levels or heal ourselves from the tragedies that befall us. Few of us know how to make a good transition from one stage in life to another, how to tap and experience the mysteries of nature or how to set the stage for an experience of the eternal, the ineffable, the infinite.

Organizations that lead people on wild country excursions offer their participants many important experiences. They care about safety, focus on the development of technical skills or leadership potential, teach people the ethics of wilderness travel, deliver high adventure. And they do a superb job achieving their goals. They know that powerful transformative experiences can occur in nature, and they know, implicitly, that this is what many of their participants seek.

But few organizations are willing or able to provide the delicate kind of guidance required to help participants fully take advantage of their right brain potential on wilderness or backcountry trips. Few organizations take advantage of the many excellent methods currently available to help participants experience themselves in wholeness, and so, many people are unable to gain the very most from their contact with the natural world or from their outdoor adventures.

We can all do more to balance adventure related activities with inner-directed processes on wilderness or backcountry trips, whether we are alone with our families, friends or colleagues or work for organizations commissioned to guide people on outdoor treks.

I would like to end with some practical suggestions about how one can more deeply tap the transformative potential of wilderness and backcountry experience if you wish to. The procedures I am about to share are distilled from the methods described throughout this talk. They have formed the core of the Wilderness Vision Quest program I have been running internationally for the past 11 years.

SUGGESTED ACTIVITIES

1. First thing in the morning, take the time to do some gentle exercise. Feel the earth. Breathe deeply, release your physical stress and psychological tension through slow and conscious movement. Enliven and enjoy your body, stretch, touch the sky, reach out and embrace the world around you.

2. Seek solitude whenever possible! Come to a complete stop for a significant period of time. Shut down the left brain and turn on the right. Sit quietly and attune yourself to the natural world. Move beneath persistent thoughts and the ever-talking mind and absorb the peace of nature. Feel the warmth of the sun. Listen to the music of the birds, to the wind, to the whispering trees. Empty your mind and let nature fill your senses.

3. Take a minimum of food on your wilderness or backcountry trip. Get a little hungry. Break your pattern of eating by the clock and eat only when you really need to. Fast for a day or two if you really want to heighten your awareness and experience yourself in some exciting new ways. Let profound contact with the natural world nourish you and satisfy your appetites.

4. Take a journal along and enjoy the finest functions of your left brain: evaluation, analysis, and reason. Write about your important experiences. Reflect on the seasons, the elements, your triumphs and disasters outdoors. Note your patterns, motives, behaviors and responses as they become clear and discover what really moves you. Reach for inspiration, maybe document your insights in poetry or song.

5. Draw pictures of your fascinations on the land. Conscious penetration into the symbolic and metaphoric dimension of the right brain is a critically important part of the transformative process. Take the time to really see nature as you sketch, paint and draw, or portray the meaning of your experiences in symbolic art.

6. Be creative, take some chances and get your body involved in kinesthetic imagery. Expand your potential for self-expression by physically identifying with nature. Become the forest, move like the trees, identify with the life around you. Open the channels of your physical body to the powerful and unsuspected currents of energy that lie dormant within you.

7. Take the time to discuss your discoveries with other people. Listen with respect to the experiences of others and take the risk to share what moves you in open and honest ways. Interpersonal skills can greatly improve through sharing the meaningful and significant events that occur to us on our outdoor adventures. As we do, we come to fully appreciate the meaning and the joy of community.

8. Finally, before you walk out of the wilderness, make an action plan. Consider the insights you have gleaned, the inspiration that has moved you, and decide how you can use them in specific, practical ways to renew your life back the regular world. Take responsibility for grounding and integrating your insights and inspiration by drawing up an action plan for the week or two immediately following your trip.

With clarified visions, renewed energy, and strong intention we can return transformed from our experience of the natural world.

OUTWARD BOUND USA

Stephen Bacon and Donna Thompson

Outward Bound is the largest and oldest adventure-based education organization in the United States. The Outward Bound system in the United States consists of the National Office and five independently controlled schools. The system is a nonprofit, tax-exempt organization supported by contributions from individuals, corporations and foundations.

Outward Bound grew out of the need to instill spiritual tenacity and the will to survive in young British seamen being torpedoed by German U-Boats during World War II. What began as a training exercise for apprentice British seamen and youth in Wales has since evolved into a modern-day program for self-discovery and personal development.

Today, Outward Bound's purpose is to develop and enhance in its participants self-confidence and self-esteem, leadership qualities, teamwork and empathy for others, service to the community and sensitivity to the environment.

The essential concept is to impel people into value-forming experiences. The process assumes that learning and understanding take place when people engage in and reflect upon experiences in challenging environments in which they must make choices, take responsible action, acquire new skills and work with others. Teamwork among participants is vital. Instilling a love and appreciation for the wilderness environment in which our courses take place is an integral part of what has come to be known as the "Outward Bound experience."

All courses include teaching core components of skills, training and physical conditioning, one or more extended expeditions, a solo experience, a service project and a marathon event. The curriculum emphasizes personal growth, teamwork and the development of compassion and social responsibility.

We remain committed to making our program available to all who wish to participate and seek to provide an adequate level of scholarship funds so no qualified student is turned away. At present, one of every five students receives some form of financial aid, and the goal is to offer at least 40 percent of young applicants financial aid even as enrollments continue to grow.

Outward Bound is an interpretation of the educational philosophy developed by Kurt Hahn. Hahn was an innovative educator in Germany and the foremost developer of the experiential education concept. He said, "No student should be compelled into opinions, but it is criminal negligence not to impel into experience."

Hahn emphasized developing and maintaining "strong awareness of responsibility for others along with the belief that strength is derived from kindness and a sense of justice." This dual emphasis on the development of self and connecting with one's community pervaded all Hahn's thinking.

To a remarkable degree, today's Outward Bound programs remain faithful to Hahn's philosophy. His experiential approach to education (learning by doing) has become a powerful complement to mainstream education. The power of his thought is demonstrated by the fact that his ideas are as relevant today as they were at their inception 50 years ago.

Our primary mission is to serve the needs of youth, but we also work with adults and special populations. Model programs have been developed to serve troubled youth, alcohol and substance abusers, the handicapped, Vietnam veterans, battered wives and others.

From the start, it was evident that Outward Bound's impact would be limited if it concentrated its efforts solely on operating its own course. Instead, it adopted a model-program strategy that encouraged imitation and provided help and consultation to r-plicators. These programs come in endless variations, from copies of Outward Bound to derivatives concentrating on some particular component.

Many of these programs were begun under the leadership of former Outward Bound instructors and students. Among them are the National Outdoor Leadership School, the Leadership Forum, New York City's Civilian Volunteer Corps, the Connecticut Wilderness School, the Santa Fe Mountain Center and Project Adventure. In addition, Outward Bound was the founding force behind the 400-member Association for Experiential Education.

The therapeutic use of the process has also been replicated. Many social service agencies have successfully developed programs similar to ours within their own communities, and at least 20 states have used similar principles for statewide youth rehabilitation programs.

The philosophy and methods pioneered by Outward Bound have also been adopted by more than 3,000 public and private schools, colleges and universities in this country. The relevance of Outward Bound to education has been confirmed by many studies. Research indicates that participants achieve higher levels of self-concept, interpersonal competence and motivation.

First established in Great Britain in 1941, Outward Bound is a worldwide network and includes 46 schools and centers on five different continents. Founders and leaders of the Outward Bound movement in the United States were Joshua L. Miner, who taught at Phillips Academy in Andover, Massachusetts, and F. Charles Froelicher, at that time, the headmaster of Colorado Academy in Denver.

Since conducting its first course at the Colorado school in 1962, almost 160,000 individuals have been served by Outward Bound USA. Every year more than 17,000 people participate in courses conducted at five American Outward Bound schools in Colorado, Hurricane Island, Maine, North Carolina, Pacific Crest, Oregon and Voyageur, Minnesota.

The Outward Bound National Office and the five schools are organized independently, governed by separate boards of trustees and bound together as a federation. The schools adhere to the essential Outward Bound curriculum, to

national safety policies and to uniform enrollment procedures. The National Office is responsible for chartering schools and supporting and developing the Outward Bound movement in the United States.

Outward Bound serves a wide range of people:

• Young people—Outward Bound today, as 45 years ago, is an educational experience aimed at helping youth develop leadership and teamwork skills, responsibility, self-confidence and self-esteem. Courses have been designed specifically for 14- and 15-year-old boys and girls. Outward Bound has proven to be an especially powerful rite of passage for young people 14 to 20 years of age.
• Youth at risk—Young people in trouble with the law or on the verge of making long-term decisions are helped by special Outward Bound courses staffed by clinically trained instructors. Positive impact is made when these participants realize, perhaps for the first time, that they are responsible and directly accountable for their own actions, not only in the wilderness but also at home with family and peers.Outward Bound also operates wilderness rehabilitation programs for adjudicated youth in Florida, Maine and Washington. A strong body of research indicates that the Outward Bound approach is a "treatment of choice" for these young people.
• Adults—Although Outward Bound was originally intended for young people, there has been an ever-increasing demand for the experience by adults. The median age of Outward Bound students is now 22.
• Executives—Each year, more than 2,000 executives and managers enroll in Outward Bound's professional development courses to build camaraderie, improve communication skills and refine leadership abilities.
• People with physical problems—Again, Outward Bound has been a proving ground to illustrate graphically to those with handicaps or chronic illnesses that many limits are self-imposed and can be overcome when challenged. Special programs for the physically handicapped, hearing impaired and those with chronic illnesses such as juvenile diabetes and juvenile arthritis have been established by Outward Bound schools. Pilot programs have demonstrated to professionals in the rehabilitation field that people with severe disabilities are more capable than was previously supposed. The impact of witnessing these courses on able-bodied students and instructors has been extraordinary.
• People in crises—The Outward Bound model was applied to another group when a founding trustee of the Colorado school proposed working with the Alcoholism Recovery Unit of St. Luke's Hospital in Denver. In October 1978 for the first time, a group of alcohol-dependent patients went into the mountains as part of the rehabilitation process. Today more than 2,000 alcohol and drug abusers are served by Outward Bound.

Based on its continuing effectiveness, Outward Bound has a strong agenda for the future:

• The social mission and the city—Although Outward Bound has functioned as

a wilderness school in the United States, it has always had a strong commitment to serving urban populations, especially underprivileged youth. In the main, this commitment has been fulfilled by offering scholarships to wilderness programs and by special contract courses designed for urban dwellers. In the past five years, Outward Bound has begun to expand this commitment by establishing urban centers for recruitment, course preparation, urban programming and follow up. Such programs have begun in Minneapolis and Baltimore and will soon begin in New York City and Boston. This increase in urban activity marks a reemphasis of Outward Bound's social mission and a rededication to the belief in the primacy of the values of compassion and interdependence.

• The mainstream education initiative—As mentioned above, the Outward Bound process has already had a strong impact on education. Some kind of Outward Bound component is included in the curriculum of hundreds of public and private educational institutions in the United States. Outward Bound seeks to expand this influence by developing additional programs which will integrate the process into academic training, drop-out prevention programs, literacy programs and other areas where it might complement existing pedagogical efforts. Such initiatives are under way across the country.

• Wilderness therapy—Outward Bound's treatment programs for troubled youth, alcoholics, Vietnam veterans, victims of domestic violence and others have received strong paeans from therapists, research scientists, and clients and their families. In addition to replicating these models, Outward Bound seeks to articulate its methodology and document its outcomes to the point where the process has a significant impact on how psychotherapy is performed in the United States. To this end, a number of outcome studies are under way. Wilderness therapy theory is being articulated and documented, and programs and treatment centers are being expanded.

THE NATIONAL OUTDOOR LEADERSHIP SCHOOL

Philip James Ratz

The National Outdoor Leadership School's (NOLS) mission is to be the best source and teacher of wilderness skills and leadership which protect the user and the environment.

The purposes of all NOLS courses are:

- To teach, study and develop the necessary techniques, skills and methods to safely live and travel and still conserve the wilderness environment;
- To teach, study and continually improve techniques of low-impact camping, outdoorsmanship and outdoor leadership;
- To develop the best outdoor leaders possible—people who are technically capable and academically well versed in all areas;
- To promote leadership that is able to meet the varying demands of outdoor wilderness users and the changing needs of the environments they use; and,
- To have an enjoyable, enlightening and intellectually stimulating wilderness experience that might serve as a means to further pursuits in the natural sciences and recreational activities.

NOLS believes that the education of users in the skills and ethics of wilderness travel is the key to continued use of wild lands without creating adverse environmental impact. Safety of the individual and care for the environment are the priorities. Outdoor living skills, leadership insight and enjoyment result as additional benefits.

Toward these goals, NOLS offers 14- to 95-day courses of various types in wilderness areas worldwide. NOLS courses are expeditions. We don't offer short courses or weekend excursions. We immerse our students in the wilderness environment where they have time to learn and appreciate leadership, skills and their surroundings, in order to become well-rounded outdoors people.

In addition, NOLS sponsors conferences on specific wilderness-related educational topics and conducts research on minimum impact, environmental conservation, user benefits and leadership.

NOLS is a nonprofit, educational organization, incorporated as a private licensed school in the state of Wyoming.

The NOLS International Headquarters is located in Lander, Wyoming, which oversees five branch schools in Wyoming, Alaska, Washington, Kenya and Mexico. The administrative staff, headed by myself, reports to a 12-member Board of Trustees. The instructional staff is selected by NOLS after a rigorous and

extensive in-house training, apprenticeship and certification program. To maintain high standards of quality and safety, the school only employs NOLS-certified instructors for fieldwork. There are currently 200 active instructors working at NOLS.

NOLS seeks to enroll a mixture of people of different backgrounds and capabilities and teaches them how to be competent expedition members. Students have come to NOLS from all over the U.S. and the world. They have ranged in age from 14 to 71, with the average age in 1987 being 22 years old. This last year NOLS had 2,000 enrolled students.

The NOLS program is based on learning by doing, improving judgment by making one's own decisions, assuming responsibility and being aware of the effects those decisions have on others and on the natural world. Lessons and facts are important because they are real, not contrived. The means by which we serve the mission statement are contained in six elements of the core curriculum.

SAFETY AND JUDGMENT

From the first day of an NOLS course, students are impressed with the emphasis on safety and their own responsibility for the safety of their fellow students. Accepting responsibility for themselves and the expedition is the first step in the NOLS safety program.

To provide students with specific safety skills, the mandatory curriculum of every course includes basic first aid, safety and accident prevention, hazard evaluation, heat- and cold-related accident prevention, and treatment and rescue techniques.

Accident prevention, first-aid training and emergency medical care are part of the NOLS instructor certification. Quality equipment is provided to all students, a low student-to-instructor ratio is maintained, and drugs and alcohol are prohibited dueing courses. Evacuation procedures are in place 24 hours a day.

The NOLS safety officer monitors injuries, reports annually to the Board of Trustees and consults with loss-control experts, physicians and other outdoor education program managers for insight into ways to improve both field and in-town safety. Safety is closely monitored at NOLS and is evidenced by its excellent safety record.

LEADERSHIP AND EXPEDITION DYNAMICS

Real problems, conflicts, varying terrain and weather conditions allow students to observe and experiment with the effectiveness and appropriateness of various leadership styles.

"Leader of the day" opportunities give students the experience of testing their own style and abilities for leading their peers. What do you do if there is a slow member in your group who cannot keep up with the others and you are faced with severe stream crossings? What happens when the summit is close but the weather looks questionable and time is running short?

The NOLS program encourages students to figure out what questions need

to be asked and to use their judgment to find solutions that work best in each particular situation. NOLS gives students an education far beyond the scope and depth of that provided by the traditional classroom.

Since 1965, NOLS has pioneered the teaching and development of practical conservation techniques designed to minimize impact. Over the years, the techniques have been continually tested, refined and improved. The NOLS conservation practices are a summary of the state of the art techniques taught in the core curriculum.

ENVIRONMENTAL AWARENESS

Geology, weather, flora and fauna identification and ecosystem relationships constitute the curriculum of environmental awareness.

Using common examples such as flowers on the edge of the trail, shells picked up from the beach, animal and bird calls, the teaching aids for lessons are everywhere and students learn to use their senses and become more observant.

Ecosystems are made up of intricately interrelated components, from minerals to insects to more complex organisms. Each component has a value and purpose, including the human visitor.

OUTDOOR LIVING SKILLS

Cooking and baking, nutrition and rationing, fishing techniques and ethics, climate control, physiology, equipment care and selection—many of these skills are part of the lesson the very first day. Practice leads to refinement and creativity, until students find themselves not merely surviving, but comfortable and living "in style" in the outdoors. Yeast and quick breads, fly-fishing for trout, quinzhee snow shelters, telemark skiing—all of these are part of living "in style," affordably, comfortably, enjoyably, safely.

TRAVEL TECHNIQUES

NOLS courses are expeditions, learning how to get from one place to the next. This includes the principles of energy conservation, trail technique, paddling technique, map reading and compass use, navigation, route finding and time-control plans.

Quality, safety, minimum impact, wilderness ethics and leadership in teaching and research in the outdoors will always be fundamental concepts of the NOLS mission. We will continue to build on our foundation of excellence in the education of future outdoor leaders and wilderness users. We are constantly evaluating curricula for improvement and creating new courses to satisfy wilderness users with more diverse and sophisticated needs. Courses targeted for special attention are the instructors' courses and outdoor educator courses. In addition, we are giving increased attention to our Wilderness Skills Courses which are designed to serve our older students in their thirties, forties, fifties and perhaps beyond.

Our third annual NOLS Wilderness Research Colloquium was cosponsored

by Dr. Robert Lucas of the USDA Forest Service Management Research Laboratory in Missoula, Montana, on the subject of identifying wilderness qualities. The participants included a mixture of academic researchers and forest management personnel. Our role is to serve as an intermediary to help translate the research findings into usable concepts for on-the-ground managers, and in turn, to translate the managers' needs to focus the researchers' efforts on the real problems.

Significant challenges face the school in the years to come, in terms of translating the wilderness education techniques that we have developed in our programs overseas—Kenya, Mexico, our expeditions in Canada and South America—into programs of value to other countries seeking to expand their human potential through wilderness activities.

We don't wish to expand overseas for the sake of adventure travel. We want to contribute and know that the value of the NOLS curriculum does not stop at national borders.

It has been 22 years since the founding of NOLS in 1965. During that time, the school has matured into an organization of size, scope and reputation of which all those who have ever been a part of the NOLS community can be proud. I believe that over the next 20 years, the school will grow responsibly, with direction and style.

Our goal is not to be the largest, but we do see ourselves as a primary source of leadership and ideas that will allow this field of wilderness education, therapy, and personal growth to expand nationally and internationally for years to come.

SUPPLEMENTAL INFORMATION

"We will establish forever the fact that wilderness not only is from gound level to the tops of the trees, but it extends underground, under the water and above the trees for an unlimited distance."

—William Penn Mott, Jr.
Director, USDI
National Park Service

KEY THEMES AND ACTION ITEMS

In addition to being an enjoyable and interesting international event, the World Wilderness Congress is an action-oriented process. Possible solutions to matters of current worldwide conservation concern are developed during the several years of congress planning and then are integrated into the congress program. The Executive Committee of the 4th WWC focused specifically on the global aspects of wilderness policy and natural resource inventory; finance and economics; the sharing of information and services; non-governmental cooperation; media and public education; science; and, art and culture. Much of what has been presented in this volume addresses details of these concerns, the collective results of which are summarized here briefly.

WILDERNESS SANCTUARIES

Harold K. Eidsvik

The single green leaf is the symbol of the World Wilderness Congress and, by extension, of wilderness. The single leaf is both compound in structure and

complex in nature, and through its veins flow the juices which sustain forests. In a similar manner, wilderness courses through our veins and sustains humanity in many manifestations.

At the 4th World Wilderness Congress, many different cultures and nationalities presented perceptions of wilderness: to the Inuit, wilderness is the wild and unkind urban jungle; to those from the urban jungle, wilderness is the vast forest, the untamed jungle or perhaps the northern tundra; to our Spanish or French speaking colleagues, wilderness is a difficult term to define, perhaps best expressed as *les aires sauvages* or, in Spanish, *los areas salvaje* or *tierras virgenes*. Whatever the perception, wilderness is that which is untamed, primitive, remote and elusive.

Thus, the 4th WWC, like the 1st, 2nd and 3rd congresses, had great difficulty arriving at a definition of wilderness which is simple, crisp and agreeable to all countries. Good progress was made, however, but let us first clarify the need for legislation and definition of wilderness, because to some people this may still seem unnecessary.

Quite simply, history shows us an inexorable destruction of wilderness. Progress has always devastated wild lands, whether one considers the Roman influences on the Middle East and North Africa, the urbanization and acidification of Europe or the leveling of tropical forests. However, it was through the mounting pressure of agricultural and industrial expansion in North America over the last 100 years that the need for an enduring defense mechanism (and the need to define what had to be protected) became clear.

In response, before the turn of the twentieth century, the pioneers of wilderness conservation began to emerge. Some, like Henry Washburn, George Catlin and John Muir, had visions of "public pleasuring grounds." Thoreau placed nature in command. Others, advocates of public lands such as Gifford Pinchot, Stephen Mather and Bob Marshall, put bureaucratic models in the forefront. Government began to play an important role, prodded by the will of such visionaries.

As a result of this steady upswing in America over concern for wilderness conservation, contemporary leaders such as David Brower, Howard Zahniser, Sigurd Olsen and Olaus Murie worked through the Sierra Club, the Wilderness Society and other movements to help codify the concept of wilderness. The pressure of American conservation groups (non-governmental organizations) eventually culminated in the passage of the 1964 Wilderness Act, and wilderness work moved into the lawyer's world—an unfortunate but necessary change in a concept perceived to be intrinsically good and, in its true state, unhindered by restraints or definitions.

For years, the concern with wilderness conservation was seen as a particularly American phenomenon. But, as industrialization marched on and the tropical forests fell, the concept continued to grow. Species extinction raised concerns about biological diversity, which led to concerns about genetic diversity, which intertwined with island biogeography, all of which have begun to be over-

laid with economic, medical, agricultural and industrial concerns. The resolution of these problems can readily be linked to undisturbed wilderness areas.

Other countries became involved in the international wilderness debate, New Zealand and South Africa among them. Most notably, Australia entered the fray and new protected area concepts such as World Heritage assumed a critical role. Tasmania and the Queensland rain forest joined the Amazon and Alaska as new testing grounds for an already tested ideology: in wilderness is the preservation of the world.

The World Wilderness Congress has given wilderness an international platform. It has dealt with the concept, the reality, the difficulties and, most importantly, the need for wilderness. Progress has been made, and wilderness is now on the international agenda in a serious and considered manner. For example, the IUCN's Commission on National Parks and Protected Areas is currently pursuing the extension of its work to incorporate wilderness.

Ever pioneering, the 4th WWC presented new concepts of wilderness for consideration. The resource of the 72 percent of nonterrestrial earth became the testing ground for a new perception, "marine wilderness," which was the central subject of a seminar at the congress coordinated by the National Oceanic and Atmospheric Administration.

The need for a universally accepted definition of wilderness is important, in spite of the myriad cultural differences that influence such a definition. Each World Wilderness Congress has grappled with this question, and progress has been made slowly but steadily. The following modification of the 4th WWC Resolution on wilderness definition can be applied to marine or terrestrial areas:

"Wilderness is an enduring natural area, legislatively protected and of sufficient size to provide the pristine natural elements, which may serve physical and spiritual well being. It is an area where little or no persistent evidence of human intrusion is permitted, so that natural processes will take place unaffected by human intervention."

In addition, the Director of the U.S. National Park Service, William Penn Mott, Jr., during the proceedings declared the intention of his agency to investigate the feasibility of underground wilderness and silent, flightless zones over parks as new extensions of the wilderness concept. These steps toward better classification and definition are good, progressive steps. They are further recognition that untouched space, untamed frontier and unexploited resources are essential to man and nature. . . .

Beyond the definitions, concepts and the policies, it seems that wilderness must remain within each of us as a secret corner and a special place. Solitude for contemplation, security of mind and security of place, a touchstone of the past and a home for the future. Whatever the legal manifestation, we can find no better place than the wilderness for this to occur. Wilderness is not a resource but a sanctuary; it is a simple leaf—a complex vein.

FOLLOW-UP

MARINE: Dr. Nancy Foster, Director, Office of Protected Resources
National Oceanic and Atmospheric Administration, 1825 Connecticut Ave.
#805, Washington, D.C., USA 20035 or

Graeme Kelleher, Great Barrier Reef, Marine Park Authority
GPO Box 791, Canberra, Act 2601, Australia

TERRESTRIAL: Harold Eidsvik, Environment Canada,
IUCN Commission on National Parks and Protected Areas
135 Dorothea Drive, Ottawa, Ontario K1V 7C6, Canada or

Vance G. Martin
International Wilderness Leadership Foundation, c/o Fulcrum, Inc.,
350 Indiana St., Suite 510, Golden, Colorado, USA 80401

A WORLD WILDERNESS INVENTORY

Peter Thacher

With our global population passing the five billion level and industrialization spreading to more remote areas, how much of the earth's land areas are still relatively undeveloped and wild—dominated by natural forces alone?

A World Wilderness inventory was conducted to be presented at the 4th World Wilderness Congress. As we learned in this first survey-level inventory, some one-third of the earth is still in a wilderness state.

This inventory should serve as a benchmark, to be refined where appropriate; against which measurements of future trends in the status of wilderness stocks and updated inventory results will be evaluated.

A novel characteristic of the World Wilderness Inventory was that inputs came from a mixture of organizations; a large membership, non-governmental

organization—the Sierra Club (U.S.); a global non-governmental organization, which includes governments in its membership—the International Union for the Conservation of Nature (IUCN); and the principal, global intergovernmental organization devoted to conservation—the United Nations Environment Programme (UNEP).

Each of these organizations has ongoing programs to which non-governmental organizations can contribute to keep the "inventory" process going (see box location for how to contribute to phase two of the World Wilderness Inventory). Also, the World Resources Institute is prepared to receive and forward contributed databases to any of the three major participants, or to others, such as the World Bank, who play supporting roles.

A SYSTEMS APPROACH TO PRESERVING SPECIES RICHNESS

Extinction of species is a major concern among conservationists and environmentalists, and it is increasingly recognized as such by the international development community—ranging from the World Bank, regional development banks, UN Development Program and other international funding agencies, to the rich mixture of bilateral foreign aid programs, such as U.S. AID (Agency for International Development) which has been directed by the U.S. Congress to pay particular attention to the protection of biological diversity.

Species extinction is a worldwide problem. An estimated 1,000 species are becoming extinct each year and the extinction rate could reach as many as 5,000 per year in the near future. The U.S. Fish and Wildlife Service lists 946 species as endangered or threatened. An additional 3,000 species have been documented with sufficient information to propose listing as endangered or threatened.

History also provides many examples of widespread, common and abundant species that are currently extinct or endangered. Since 1620, over 500 species and subspecies of native plants and animals in North America, and more massive losses in the world's tropical rain forests, have been recorded. The passenger pigeon (*Ectopistes migratorius*) and the plains bison (*Bison bisan*) are but two familiar examples. If history is any guide, without appropriate ecosystems-level conservation actions (based on sound biophysical, ecological, socio-economic and geopolitical foundations), a number of species currently abundant will soon join the ranks of the endangered or extinct classes.

With our current knowledge we are not even able to begin to assess our species losses. Public and private data bases commonly restrict themselves to the monitoring of less than 10 percent of the rarest of all species or those species that are hunted. Monitoring efforts for rare species—while addressing the immediate need for protecting these species—give us no overall framework for analysis of long-term trends in biological diversity.

In the last century the conservation movement has begun to recognize the need for the protection of natural diversity. Yet as scores of rare species have approached extinction, both public institutions and private organizations have been forced to use heroic measures to save, on remnant patches of habitat, the

last individuals of endangered species. And while the list of endangered species grows, no assessment of the distribution of biological richness, relative to the location of management areas, exists from which to determine the scope of our global conservation need.

It is a sad commentary that the current practice of what may be called "emergency-room conservation" serves to channel most of our economic and emotional support toward those few species which may be least likely to benefit from it. Such efforts, while commendable, suffer from a lack of perspective of preserving the overall biological diversity on this planet.

This latter objective is better served by applying the tools of conservation biology and modern geoprocessing technology to the analysis of the majority of the earth's species to determine how and where they might persist in relatively undisturbed situations, and then managing ecosystems rather than individual species. A major problem lies, however, in our lack of current knowledge on where to focus our management efforts. What is required is a program to assess the numbers of species that are encompassed by existing preserves and where future preserves could be located to protect the most species.

This objective can be met through the use of a Geographic Information Systems (GIS) in which data on species distributions are combined with data on boundaries of existing preserves and other environmental and socioeconomic data. Such a system, constructed with the appropriate layers of data and additional historical information on population and land-use trends, can:

- Improve significantly the effectiveness of current multispecies management practices; and,
- Anticipate the endangerment of a population, species or community.

This is the approach called for in the Brundtland Report—the 1987 Report of the World Commission on Environment and Development chaired by the Prime Minister of Norway, Gro H. Brundtland—which specifically called for drawing up inventories and descriptions of "lands, forests, and waters that are detailed enough to provide a basis for delineating land categories. . . using satellite monitoring and other rapidly changing techniques" to strengthen national planning for sustainable development.

Toward this end, the commission proposed that "development agencies, and the World Bank in particular, should develop easily usable methodologies to augment their own appraisal techniques and to assist developing countries to improve their capacity for environmental assessment." The presentation of the inventory during the 4th World Wilderness Congress was a demonstration of the feasibility of this approach. It is one which should be expanded and continued with the support of private, academic and corporate groups holding data about natural resources.

The WWC adopted a detailed resolution specifically intended to encourage this process whereby the "inventory presentation could be further improved in

quality and scale," and which highlighted the role that could be played by the Global Resources Information Database (GRID) set up by UNEP in Geneva and at its world headquarters in Nairobi.

When fully developed, GRID will serve a network of regional centers located in the regional headquarters of the United Nations or other appropriate intergovernmental bodies. Each center will be equipped with mini- or advanced microcomputers, image analyzers and a GIS and will serve as a training center, the nucleus from which national nodes may be assisted.

Global and regional data sets, acquired from organizations such as FAO, WHO, WMO, UNESCO, NASA, Spot-Image and others will be transmitted to national nodes, which in turn will contribute their data toward the build-up of global data sets to improve understanding of global trends and processes, thus aiding such global programs as the International Geosphere Biosphere Program (IGBP).

Presentations by IUCN and UNEP on the opening day of the 4th World Wilderness Congress made clear that composites of information can:

1. Identify those wilderness areas where investments would yield the greatest returns in terms of safeguarding areas of high value for the future (such as the areas known to FAO where rich genetic diversity can still be found for food crops of present and future importance); and,

2. Determine high rates—or risks—of deforestation, soil erosion or other forms of degradation that reduce the ability of the land to support future economic growth.

In the final analysis the success of efforts to preserve biological diversity will not be judged on whether we save the California condor or the black-footed ferret, but on the number of species surviving in the year 2100 and beyond. The time to save a species is when it is still abundant. The technology and the raw data exist to begin to develop this type of systems approach to preserving biological diversity. By focusing our efforts on species-rich areas we can hopefully retain maximum diversity in the minimal area in the most efficient and cost-effective way while not abandoning the concept of protecting individual threatened or endangered species. There exists a pressing need for the conservation movement to augment existing programs with a systems-level approach to the preservation of biological diversity. It is such an approach which currently offers the best chance of saving the largest number of cogs that keep turning this closed life-support system we call earth.

WORLD WILDERNESS INVENTORY—PHASE TWO

The Sierra Club is now ready to launch the next phase of its pioneering inventory of global wilderness areas. This involves verification and further refining of its data, to yield a more exact and current overview of the size and boundaries of thes areas. To accomplish this, NGOs, national parks agencies, scientists, managers and educators from all countries cited in the study are encouraged to send data base information and/or current knowledge of wild lands

cited in the original study. Participants will not only help substantiate the report, but will also form a network which will eventually identify smaller areas and help monitor changes to the World Wilderness Inventory. (Follow-up: see page 357.) Copies of the original studies are available and further information can be obtained from Michael McCloskey, Chairman, The Sierra Club, 330 Pennsylvania Avenue SE, Washington, D.C., USA 20003.

INTERNATIONAL CONSERVATION FINANCE PROGRAMME

I. Michael Sweatman

When planning began for the 4th World Wilderness Congress, the International Wilderness Leadership Foundation (IWLF) established as a priority agenda item the linkage between a healthy economy and a healthy environment, particularly in developing nations. It was evident that a combination of economic forces were having a detrimental impact upon the natural resource base of developing nations, and that a major new initiative combining international finance and conservation needs would be necessary in order to address the increasingly urgent problems.

In 1984 the concept of a World Conservation Bank was developed by the IWLF. Consultations and meetings were held with non-governmental organizations and the private and public sectors, including many of the advisors to the 4th World Wilderness Congress. An initial concept paper, "The World Conservation Bank," was presented to the World Commission on Environment and Development (WCED) at its Ottawa hearings in May 1986. As a result of this submission and the rising tide of evidence concerning the impact on the environment from the activities of multilateral development banks and other agencies, in its final report, *Our Common Future*, the Commission urged that "serious consideration be given to the development of a special international banking programme or facility," with the objective of sharply increasing "investments in conservation projects and national conservation strategies that enhance the resource base for

development," which could "provide loans and facilitate joint financing arrangements for the development and protection of critical habitats and ecosystems, including those of international significance, supplementing efforts of bi-lateral aid agencies, multilateral financial institutions and commercial banks."

This initiative was a matter of thorough discussion during plenary sessions and in a three-day caucus session at the 4th WWC. The United Nations Development Programme (UNDP), the World Resources Institute (WRI), the International Union for the Conservation of Nature and Natural Resources (IUCN) and other organizations announced their intention to draw up a proposal for a feasibility study for such a program. A resolution supporting this was passed by the plenary session of the 4th World Wilderness Congress.

The UNDP and WRI have acted decisively on this resolution and are now planning to conduct the feasibility study along the following lines:

PURPOSE

In order to carry out the serious consideration called for, the WCED, WRI, UNDP and others propose an intensive 15-month effort designed to facilitate broad international consideration of how best to respond to the need identified by the Brundtland Commission. The process itself should lay the basis for appropriate actions by governments, intergovernmental bodies, the private sector, and non-governmental organizations.

OBJECTIVES

First, a more careful and precise definition will be made of unmet needs and unrealized opportunities for conservation funding and investments in developing countries. This effort will require identification of related programs and activities, types of projects that are currently underfunded, and institutional and other barriers to increase support in needed areas.

Second, the process will identify and provide a common basis for international review of, alternatives for responding to these needs and opportunities. This will have two distinct but closely related dimensions: (a) what functions need to be strengthened, what new services provide, and what new or enlarged sources of support can be made available; (b) possible institutional arrangements for performing these functions, mobilizing support and meeting the needs identified.

Among the institutional options to be examined are:

- A freestanding new entity—perhaps intergovernmental, perhaps a non-governmental organization, perhaps a new public-private hybrid;
- An entity created by a consortium of principally governmental bodies but perhaps also including private sector institutions;
- An entity adjunct to or associated with an existing intergovernmental institution such as the World Bank, UNEP and IUCN; and,
- Strengthening existing institutions and programs.

Third, the process will stimulate broad and open international deliberation on the various options. Key participants in these deliberations will be experts from developing country governments, the international development assistance community (bilateral and multilateral development assistance agencies, multilateral development banks and others), the private banking community, environmental and other NGOs in both industrial and developing countries, multinational corporations and others.

This process of informed international deliberation, carried out on the basis of a common identification of the problem and of the principal options for action, will hopefully bring consensus around a common agenda. The goal of this 15-month project, then, is to provide a springboard to action through facilitating open and informed deliberation on a matter of urgent international concern.

THE PROPOSED PROCESS

1.The Needs and Options Paper: Intensive discussions will be undertaken with all relevant parties to provide a careful definition of the options for action and spell out the pros and cons of each. Each option would be defined in terms of (a) institutional innovation (if any) involved, (b) functions performed and services provided and (c) funding and operating mechanisms.

2.Constituency Development and Consultations: Bringing new ideas to life requires leadership, entrepreneurship and the careful development of a broad and informed constituency. Providing leadership in these areas requires a major continuing commitment for the life of the project. It is further proposed that the originator of the World Conservation Bank proposal, banker Michael Sweatman, will be joining WRI as a Visiting Fellow to provide leadership in these important areas and also to provide financial expertise.

3.International Symposium: This symposium will be coordinated with, but will be in addition to, the extensive consultations, meetings and briefings that will be occurring throughout the project. It will be held after the final needs and options paper is available, probably in a developing country. It will not be large (35 participants) but will include representation from all the project sponsors and relevant communities, including those that would have to be involved in or affected by the various options under review.

ORGANIZATION

A small but broadly representative advisory committee will be convened, including representation from developing countries and other key communities. The role of World Resources Institute will be to produce the needs and options paper, to provide a base for the consultations and outreach work of Michael Sweatman and others, and to work with UNDP and the project funders to plan the symposium and otherwise to promote wide international deliberation of the issues and ideas surfaced in the process.

FOLLOW-UP

I. Michael Sweatman, Visiting Fellow, World Resources Institute, 1735 New York Avenue, NW, Washington, D.C., USA 20006.

THE NEED FOR A WORLD CONSERVATION SERVICE

Joan Martin-Brown

Environmental challenges now loom very large and are simply greater in scale and complexity than can be dealt with by any single organization or nation. At the same time there is an increasing proliferation of governmental agencies, non-governmental organizations, research institutions and data bases that are trying to cope with parts of the problem. One of the greatest challenges is to bring the best available expertise (in the form of professional conservationists and scientists who have the most current information) together with the managers, volunteers or field workers who can actually work directly on the problem.

In recent years, many non-governmental organizations have considered the need for a means by which they can officially network their conservation knowledge, needs, resources and techniques, in order to encourage other efforts and improve those that are already involved in this field. In addition, many governmental agencies are considering the establishment of some type of service corps dedicated to environmental management and natural resource protection. This concept has been referred to under the generic title, World Conservation Service.

Because of the need for conservation cooperation and for increased interchange of techniques and information, the 4th World Wilderness Congress Executive Committee identified this area as one of its Worldwide Conservation objectives and agreed to explore the matter at greater length. A caucus session was established to serve as a focal point for discussions and presentations during the proceedings. Eight case studies were presented during this session, illustrating a variety of vehicles through which global-conservation needs can be addressed and met. The case studies were:

- CARE—"The Role Played by CARE in Conservation Projects in the Developing World"—John Michael Kramer, Vice President, Science, 660 First Avenue, New York, NY, USA 10016;
- EarthWatch—"Bringing Scientific Expertise and Public Volunteer Assistance to Environmental Challenges Throughout the World"—Brian Rosborough, President, 680 Mount Auburn Street, Watertown, Massachusetts, USA 02172;
- Peace Corps—"Conservation and the U.S. Peace Corps"—Arlan Erdahl, Deputy Director, M-900, 806 Connecticut Avenue, NW, Washington, D.C., USA 20526;
- Youths for Environment and Service (YES)—"A Model for a World Conservation Corps"—Ira Kaufmann, Director, and Sureya Ozkizilcik, 111 South Patrick Street, Arlington, Virginia, USA 22314;
- ECONET—"A Computer Network for the World's Environmental Commu-

nity"—Dusty Zaunbrecher, Director, 3228 Sacramento Street, San Francisco, California, USA 94115.

• Australian Trust for Conservation Volunteers—"Organizing Voluntary Manpower to Benefit the Environment"—Tim B. Cox, National Director, P.O. Box 423, Ballarat, Victoria 3350, Australia.

• California Conservation Corps—"International Youth Work Exchanges: Bringing Together Two Precious Resources—Youth and the Environment"—Tim Rochte, Administrator, International Work Exchange Programs, California Conservation Corps, P.O. Box 1380, San Luis Obispo, California, USA 93406.

• Involvement Corps—"Conservation and Corporate Sponsorships—an Emerging Issue"—Ellen B. Linsley, President, 15515 Sunset Boulevard, Suite 108, Pacific Palisades, California, USA 90272.

As each case study was presented, there was thorough discussion and feedback from caucus participants, who included conservationists from the public and private sectors in Australia, Botswana, Canada, El Salvador, Ghana, India, Norway, the Philippines, Qatar, St. Lucia, Sri Lanka and the United States.

The proposed World Conservation Service would function as a hub for both governmental and non-governmental organizations, working internationally to connect scientific and managerial information to practically applied volunteer exchanges in support of environmental management. A fundamental requirement is to carry out work that is needed to benefit environmental stability, and to do so through cooperative ventures between different nationalities and cultural approaches. One of the first and continually important aspects is a communications program that will assist non-governmental organizations in finding information and in locating assistance which will enable them to meet the demands of local and regional conservation challenges.

In summary form, the resolution adopted in plenary session of the 4th World Wilderness Congress requests:

1. That the Australian Trust for Conservation Volunteers, in cooperation with other concerned organizations and individuals, form an international association of practical conservationists before October 1, 1988 and report to all participants of the WWC before that date.

2. That this association be developed with the assistance of the United Nations Environment Programme (in cooperation with other United Nations agencies), which will provide the coordinating mechanism for activities of the initial 12-month period and facilitate the formation of a full steering committee which will address the needs of communication and information, funding, membership and the active role of the proposed World Conservation Service before October 1, 1988.

Meetings are being hosted by the United Nations Environment Programme to determine follow-through on this resolution. A newsletter is planned to facilitate initial communications and information sharing.

A pilot project has been agreed upon between the Australian Trust for

Conservation Volunteers, the California Conservation Corps, Los Angeles Conservation Corps, San Francisco Conservation Corps and East Bay Conservation Corps. There will be an exchange of composite teams of staff, participants and volunteers, each taking part in the field operations of the host organization as well as attending relevant training courses. Conservationists from developing nations are encouraged to participate, as are all parties representing organizations or participating privately. Coordinator for this initial phase is Tim B. Cox of the Australian Trust for Conservation Volunteers.
FOLLOW-UP; World Conservation Service, Joan Martin-Brown, United Nations Environment Programme, 1889 F. St., Washington D.C USA, 20006; Tim Cox, Australian Trust for Conservation Volunteers, P.O. Box 423, Ballarat, Victoria, 3350 Australia.

INTERNATIONAL NON-GOVERNMENTAL COOPERATION

Susan Abbasi

International cooperation among non-governmental organizations (NGOs) was an item of major attention at the 4th World Wilderness Congress. As well as plenary presentations covering successful non-governmental approaches to sustainable development, a three-day caucus convened, under the chairmanship of Edgar Wayburn, facilitated by Diane Lowrie, which explored a variety of models in regional and international NGO networks.

UNITED STATES—The Natural Resources Defense Council highlighted the very successful cooperation between numerous American NGOs to promote environmentally sound economic development policies by the U.S. Agency for International Development (AID), the World Bank and other multilateral development banks (MDBs). This collaborative approach in lobbying key members of the U.S. Congress resulted in legislation being passed each year for five years requiring the U.S. to influence the MDBs on environmental policy and also increasing priority for forest and wetlands' protection and the preservation of biological diversity.

ASIA/PACIFIC—Sahabat Alam Malaysia (Friends of the Earth Malaysia) presented the work of APPEN (Asian Pacific People's Environment Network),

which links NGOs of a great many countries from throughout that region. This network has begun to be effective despite the challenges inherent when operating in countries less open to dissent and public criticism than are Western, developed nations.

LATIN AMERICA—Conservation International (USA) convened colleagues from: Bolivia—Maria Teresa Ortiz (Conservation International 1015 18th Street NW, Suite 1002, Washington, D.C., USA 20036) presented the U.S.-Bolivian cooperation on the first successful conservation/debt swap; Venezuela—Aldemaro Romero (Executive Director, BIOMA, Apartado de Correos 1968, Sabana Grande, Zona Postal 1050, Caracas, Venezuela) discussed the increase of NGO networking within his country; Mexico—Ramon Perez Gil, (Instituto de Historia Natural, Apartado No. 6, Tuxtla Guitierrez C.P., Chiapas 2900, Mexico).

CANADA—The Western Canada Wilderness Forum (a coalition of many environmental NGOs) illustrated how their collaborative efforts have focused on the west coast of Canada, culminating successfully in protective statute being granted to the unique Port Moresby area and ensuing action being taken on adjacent areas under threat principally from energy and timber development;

EUROPE—Two examples of regional cooperation were presented, including the British/Swedish work on Acid Rain mitigation (Crister Aagren, Swedish NGO Secretariat on acid rain, Miljovard, Vallgatan 22 S-411 16 Gotegborg, Sweden) and a coalition now working successfully on protecting from increasing pollution the coastal/wetland areas of the Waddensea (Karel van der Zweip, Waddenvereniging, Waddenhuis, Harlingen, Netherlands).

Despite the nature of the political system in which they operated or the level of staffing and funding they achieved, all of the NGO case studies illustrated similar key functions:

1. Problem Identification—NGOs often provide a "watchdog" service to the public, identifying public health hazards, wild land values that may be lost if unwise developments occur, and environmental impacts of nonsustainable development which may be overlooked by proponents of that particular project;

2. Public Awareness and Education—Once problems are identified, NGOs play a critical role in educating the public about the nature of the problem and the policies needed for remedies;

3. Directly Influencing Policy—Known as 'lobbying' in the United States, the role of persuading policymakers and presenting options for policy changes has been a critical one for NGOs. Such efforts are particularly effective when groups work together in sizeable coalitions; and,

4. Information Sharing—This is perhaps one of the most important benefits of regional and international networking. In most cases the expertise of one organization was effectively combined with the information of regional or national situations contained by another organization. This was especially relevant in examples of cooperation between developed and developing nation NGO's. The ensuing solutions proved to be more coherently implemented, cost effective and labor efficient.

Progress on environmental issues has long been associated with the activities of non-governmental organizations (NGOs). These public conservation organizations are usually involved with organizing popular, grass roots involvement in conservation issues, in doing research and/or lobbying elected officials. Until recently, NGO activity has occurred almost entirely within developed nations.

In recent years, as environmental problems have increased in complexity and scale, a new aspect to NGO action is beginning to emerge. A unified, or at least cooperative, approach among non-governmental organizations is increasingly called for. This is true not only within nations themselves, but also regionally and internationally. The role played by NGOs will continue to increase, a fact which is emphasized in *Our Common Future,* the report of the Brundtland Commission.

Networks of organizations sharing resources such as information, expertise and funding are seen as an effective manner in which to address sustainable development challenges.(Follow-up: see page 356) For further information about international NGO networks, in addition to the above addresses, contact the following:

Diane Lowrie, Global Tomorrow Coalition, 1325 G Street NW, Suite 915, Washington, D.C., USA 20007 or Dr. Edgar Wayburn or Michael McCloskey, Sierra Club, Earthcare Network, 330 Pennsylvania Avenue SE, Washington, D.C. USA 20003.

INTERNATIONAL PARKS FORUM OF THE AMERICAS AND THE CARIBBEAN

At the 4th WWC, the National Parks and Conservation Association, in collaboration with the Canadian Parks and Wilderness Society, with 58 participants from 17 countries, initiated this new, network of NGOs to work for the protection and sound management of national parks in the Americas and Caribbeans. Regional coordinators have been named and organization is now under way.

Chairman Dr. Felix Nunez, President, Fundacion de Parques Nacionales Y Medio Ambiente, Apartado 6-6623, El Dorado, Panama; or Regional Coordinator, South America, Mr. Alfredo E. Ferreyros G., Asociacion de Ecologia y Conservation (ECCO), Vanderghen 560-2A, Lima 27, Peru or Regional Coordinator, Caribbean, Mr. Mark D. Griffith, Research Director, Environment Unit, Ministry of Employment, Labour Relations and Community Development, Government of Barbados, P.O. Box 722, Bridgetown, Barbados or Regional Coordinator North America, Mr. Paul Pritch ard, President, National Parks and Conservation Association, 1015 31st Street NW, Washington, D.C., USA 20007.

A CONSERVATION MEDIA STRATEGY

Norma Foster

Today's environmental issues affect all nations and all segments of society. As such, they need to be communicated, understood and consequently supported by more global constituencies and a wider range of the public. Communication of environment and development concerns is as vital as research and policy efforts.

Most major conservation conferences on the important global issues of our times use a traditional process of communicating, which often results in only minimal advance publicity. A basic form of communicating is usually via newsletters, announcements in journals and on-site speeches. These are essentially paper conferences that also result in minimal press coverage and little post-conference publicity.

These traditional conferences are often useful, but have a built-in limitation: only a limited number of people have access to the information and materials beforehand, and even fewer are able to participate in the rewarding personal and professional discussions that occur during the event itself. If the public is invited (which is seldom the case), prospective participants are usually drawn from a selected mailing list of people who are already committed to and/or informed of the issues.

To reach the public, conservation events should be planned as topical, exciting and effective occasions to which the media can respond. If the program is excellent, with a diversity of professionals and members of the public, the media will have a great opportunity to report on issues of vital importance to our future.

Our objective for the 4th World Wilderness Congress was to expand communication to the wider public by making use of many new techniques in the print, visual and electronic media. In addition, the 4th WWC (like all previous World Wilderness Congresses) was open to the public.

A communications plan was created 18 months prior to the 4th WWC. It incorporated precongress publicity, on-site media exposure and follow-up coverage. There was close liaison between fund-raising efforts and media exposure, especially in the precongress period. The intensive activity commenced 12 months prior, outlined on a four-phase flow chart. Volunteers were solicited nationally, through committees or contacts in numerous cities. Six months prior to the congress we concentrated efforts in the state of Colorado and city of Denver in addition to the national and international efforts under way.

All the latest techniques and facilities available to the print, electronic and

visual media were utilized:

1. Public Relations/Communications—In the international, national and local areas, early contact was made with specific individuals, agencies, corporations and organizations, both governmental and private. Concentrated, persistent effort yielded rewarding support and involvement from all sectors. Formally requested welcoming letters and proclamations were received from the President of the United States, the Prime Minister of India, the Governor of Colorado, Mayor of Denver and the mayors of 12 neighboring cities. Art auctions and entertainment events were produced prior to and during the 4th WWC, to stimulate interest from the wider public and the media.

2. Advance Press Releases—Prior to the congress, important issues were covered on a monthly basis, released both through news wire services and targeted mailings. Coverage was obtained in national dailies and magazines throughout the United States and abroad.

3. Public Service Announcements—This is an important element for the general public. Celebrity endorsement and participation was offered by Richard Chamberlain, and public service announcements were produced for radio and television. Air time is donated to bona fide nonprofit organizations.

4. Promotional Video—A professionally produced and edited 14-minute video highlighted the history, current objectives, program and organization of the World Wilderness Congress. Time, services and duplication were largely donated, the product was used widely in all promotional activities and was transmitted via satellite to cable television stations in the United States.

5. Satellite—Two features of the 4th WWC, the opening ceremonies and the final public hearing of the World Commission on Environment and Development, were carried live via satellite and were made available free of charge to television for use in full or to be excerpted for news clips. Satellite time and transmission were mostly donated, and equipment fees were negotiated to a reasonable level.

6. Press Corps—During the congress, 75 journalists from various media requested and received interviews with leading figures.There were daily press conferences on important issues and personalities. Press releases were issued from an on-site computer to national news wire services and distributed to 1,750 newspaper, television and radio outlets. In the week of the 4th WWC, over 200 different articles appeared in daily newspapers in the United States and abroad, with follow-up articles appearing for a month afterward.

7. Film and Video—Film and professional broadcast video crews documented all major portions of the conference.

There is a close link between a successful media campaign and fund-raising. The visual elements recorded during the congress have stimulated numerous inquiries regarding their use in commercial and educational markets. In addition, with the extra attention and public participation in the congress, there was a greater market for memorabilia such as sportswear with the congress logo and a specially minted, commemorative silver coin, all of which were handled by a

marketing company obtained by our agent.

Post-Congress Activity—Immediately following the 4th WWC, the Denver Declaration was presented to the U.S. Congress and formally entered into the Congressional Record of the Senate and House of Representatives. It was also entered into the permanent record of the United Nations after being presented during the General Assembly. Work is continuing with the U.S. Congress, with plans for a Joint Resolution incorporating the objectives of the Denver Declaration to be passed for World Environment Day in 1988. Long-term follow-up includes work by sponsoring organizations on the 48 Plenary Resolutions. Most importantly, an educational video series for colleges and universities is being prepared. Utilizing the information and discussion filmed at the 4th WWC, the series will present an overview of Worldwide Conservation. Marketing will be under the auspices of the International Wilderness Leadership Foundation.

Conservation activities are constantly underfunded. The cost of media and public relations is often seen as a barrier to increased communications. There are ways to achieve a great deal. For relatively small amounts of money, time, services and equipment were donated by professionals. Volunteers, less-trained but equally valuable, are available if you look and ask for help.By making efforts to research, plan for and use the innovative new technologies in communication, conservation will be more effective for your effort.

FOLLOW-UP

Charisma Communications, 8621 Wilshire Blvd., Suite 204
Beverly Hills, CA, USA 90211.

SCIENCE AND CONSERVATION

John C. Hendee

(Editor's note:) There were six technical sessions attended by scientists from many countries. The proceedings of individual sessions are available from program leaders. Conservation is replete with differences in belief about the causes of environmental problems and their likely solutions. Organizations and disciplines reflect these differences in their perspectives and priorities.

Increased dialogue among all these differing viewpoints, toward greater understanding and consensus, is a major purpose of the World Wilderness Congress. Differing views must be acknowledged and honored before protagonists can discuss them productively, rationally and diplomatically. Only then can lasting agreement be reached.

In such debate, expertise and evidence are needed to resolve questions of fact. Science can contribute important perspectives to worldwide conservation: evidence about the nature and degree of environmental problems; evidence about alternative solutions and their probable effects; descriptions of natural processes so as to better predict effects and thereby prescribe more effective mitigating actions.

With this in mind, and as a result of resolutions from the 3rd World Wilderness Congress in Scotland, the International Wilderness Leadership Foundation resolved to help further integrate science into public conservation.

The major goal of the science program of the 4th World Wilderness Congress was a renewed infusion of science and scientists into worldwide conservation, with two main purposes:

- To strengthen dialogue between scientists and other conservationists—the WWC process expanded collaboration through the attendance of more than 400 scientists, and their interaction with citizen environmentalists, resource managers, educators and other delegates; and,
- To strengthen involvement of scientists in conservation issues—scientific data and expertise were focused on worldwide conservation issues in more than 200 presentations by scientists complementing other views based on ideology, belief and conservation principles and values.

Through the people-to-people involvement of scientists with other conservationists at the congress, new personal contacts and friendships were formed that will grow into future collaborations spanning disciplines, perspectives and countries.

Distinguished scientists participated in all aspects of the congress. The plenary program featured presentations by scientists from Europe, Asia, Africa,

North and South America on global atmospheric and climate changes, population, land use, wildlife conservation and many other topics. Six scientific symposia were organized by leaders in their respective fields and addressed topics with technical papers, poster sessions, demonstrations and workshops. Each symposium will publish its own separate proceedings to make the information available to scientific disciplines as well as to conservationists. Persons interested in details of scientific symposia can order proceedings from the leaders at the addresses indicated. The symposia topics and leaders were:

ACID-RAIN IMPACTS ON WILDERNESS, PARKS AND NATURE RESERVES

Sponsored by: USDA Forest Service, U.S. Environmental Protection Agency, and U.S. National Park Service.

Program Leader: Dr. John D. McCrone, Coordinator, Cooperative Park Studies Unit, National Park Service, Clemson University, Clemson, South Carolina, USA 29631.
Associate Leaders: Dr. David Parsons, National Park Service and Dr. Ann Bartuska, U.S. Forest Service.

Forty leading scientists from Canada, Chile, Czechoslovakia, Mexico, Sweden and the United States addressed such topics as monitoring atmospheric pollution (including long-range transport and visibility), aquatic effects and vegetation effects.

Although termed "acid rain" because of its familiarity to the public, the related problem stems from many forms of atmospheric and air pollution, including wet and dry deposition, clouds, fog, particulate matter, ozone, sulfur dioxide, nitrogen oxides, organics and even carbon dioxide. Evidence presented that showed sensitive lakes in the eastern United States do not have stable chemistry and are continuing to acidify, a process which has been under way for 25 years. The fauna and flora of aquatic ecosystems in the eastern United States and Canada are being profoundly altered over large areas.

Strong evidence was also presented that vegetation effects and forest deterioration are taking place in many parts of the world, but it is difficult to show cause and effect relationships. There are only a few cases where tree death and forest decline can be definitively linked to air pollution. Clearly there are multiple and interactive stresses, both natural and anthropogenic that must be considered and studied. Only with long-term monitoring will we be able to separate natural variability from pollutant stress and thus more fully understand what is happening in natural ecosystems. Data presented on soil acidification in Sweden and vegetation change in Czechoslovakia clearly testified to the importance of such approaches.

The lack of scientific findings do not justify a lack of action in political and regulatory arenas. Throughout history man has had to act on the basis of infor-

mation that was available at the time. Lack of action before all the facts are in may mean that we will eventually have to deal with processes that are irreversible. The importance of clean air was recognized by Chief Seattle of the American Indians who said in 1854: "The air is precious to the red man for all things share the same breath—the beast, the tree, the man—we all share the same breath. The white man does not seem to notice the air he breathes. . . if we sell you our land, you must keep it apart and sacred, as a place where even the white man can go to taste the wind that is sweetened by the meadow flowers."

DESIGNATION AND MANAGEMENT OF PARK AND WILDERNESS RESERVES

Program Leaders: Dr. Edwin Krumpe, Director, Wilderness Resource Center, University of Idaho, Moscow, Idaho, USA 83843; and Mr. Paul Weingart, U.S. Forest Service.

The five sessions with 27 papers and 27 poster presentations consisted of a good variety of U.S. and international perspectives, agreeing that:

- Key ecosystems and biogeographical regions of the world still lack representation in park and wilderness reserves;
- With examples and data, the presentations and discussions highlighted that wilderness and park reserves should be managed to endure. The management must focus on influence both inside and external to the protected area;
- Park and wilderness problems and threats are amazingly similar around the world and involve population pressures; resource overconsumption, including logging, grazing, mining, uncontrolled tourism, hydropower development, settlement, introduction and imbalance by exotic plants and animals;and,
- The concept of diversity is a key to understanding natural areas and protection must include the preservation of genetic diversity from which great future benefits will be derived by humankind.

THE USE OF WILDERNESS FOR PERSONAL GROWTH, THERAPY AND EDUCATION

Sponsored by: National Outdoor Leadership School
Program Leaders: Dr. Tim Easley, Chairman, Dept. of Forest Resources, University of New Brunswick, Bag Service #44555, Fredericton, New Brunswick, Canada E3B 6C2; and Dr. Joe Passineau, South Dakota State University.

This program consisted of 12 sessions offering 28 technical presentations and nine demonstrations and experiential workshops, ranging from presentations of theory about the effects and values of wilderness experiences to empirical studies of wilderness experience programs such as Outward Bound and the National Outdoor Leadership School. Recurring needs, themes, concepts and paradoxes emerged:

1. There is a need for additional theoretical models to explain the beneficial effects of wilderness and outdoor experiences and the continuum of personal growth. The need for theory is matched by the need for more empirical study and discussion to clarify and determine relationships between wilderness values, wilderness programs and wilderness benefits;

2. Wilderness resource managers must reflect the human effects of wilderness use in management to help facilitate such efforts. Scientific evidence is yet evolving, but the issue can be constructively addressed by expanding dialogue between wilderness managers, scientists, wilderness experience program participants and leaders;and,

3. There is great need for wilderness education to foster environmental awareness, sensitivity and skills among wilderness users so that appreciation and use of wilderness do not ultimately destroy it. Much could be accomplished with expanded cooperation between wilderness managers and existing environmental education organizations and networks, such as the Alliance for Environmental Education (AEE), the National Association of Environmental Educators (NAEE), the United Nations Environmental Program (UNEP) and existing outdoor leadership and wilderness experience programs.

POPULATION AND ENVIRONMENTAL STRESS

Program Leaders: Dr. Rupert Cutler, (Former) Executive Director, Population-Environment Balance, Inc.; and Dr. Robert Repetto, Senior Economist, World Resources Institute, 1735 New York Avenue, NW, Washington, D.C., USA 20006.

Lively debate occurred during four sessions with presentations by 12 prestigious authors. Conclusions:

- The global population problem results from an aggregation of national population problems and their different approaches to population stabilization;
- Internal and international migration of population doesn't solve population problems, it just changes the location;
- The world could cope with a slowly growing population synchronized with technical innovation, but population is growing much faster than such an optimum trajectory;
- The average number of children born to each woman in Africa today is 6.5;
- Fertility control efforts must be accompanied by improvement in the status of women, reduction in poverty and opportunities for employment;
- Illegal abortion is the leading cause of death in young women in Latin America and a major cause of death among poor women in North America;
- Birth control isn't population control—population control depends upon couples wanting to have small families; and,
- If we don't have the courage to require developing nations to lower their birth rates in exchange for food, we'll be guilty over time of increasing their suffering.

THE MAN AND BIOSPHERE (MAB) PROGRAM

Sponsored by: U.S. MAB, USDA Forest Service and UNESCO/MAB, PARIS

Program Leaders: Dr. William Gregg, Cochairman, US-MAB Project, USDI, National Park Service, Washington, D.C., USA 20240; and Dr. Stanley Krugman, Cochairman, US-MAB Project, USDA Forest Service. Adviser: Gonzalo Halffter. Investigador Nacional, Instituto de Ecologia; and Chairman, Mexican National Committee for Man and the Biosphere, MEXICO.

Sixteen papers by authors from nine countries presented an evolutionary history of the biosphere-reserve concept and offered status reports on implementation in different regions of the world. Sixteen additional case studies presented in poster sessions pointed out how the concept is being applied on the ground in Canada, Costa Rica, Mexico, Panama, the Philippines and the United States.

Some attendees reflected the perception that biosphere reserves are another form of national parks. Discussions clarified the more expansive function of biosphere reserves, which may integrate a national park into a broader region.

One of the papers explained how discovery of *Zeea diploperennis*, a wild perennial plant related to maize, stimulated the establishment of a large biosphere reserve in Mexico based on cooperation between scientists and local people. Only 1 percent of this Mexican biosphere reserve is in public ownership.

Another paper described the work of the Kuna and Embera people in building biosphere reserves to secure a productive future for indigenous people in tropical forests. The report included statements by tribal leaders that, although the biosphere reserve term was new to their vocabulary, the ethic it embodies has been a part of their culture for millennia.

Other papers documented that successful biosphere reserves are built on long-term commitment and full involvement of conservationists, scientists and those in economic sectors. The establishment of a global network of biosphere reserves—a large area combining the protection and use of natural environments—provides centers for understanding the coevolution of human societies and the natural environment. They are places where men and women of vision can develop alternative patterns of use which are ecologically sustainable, culturally appropriate and meet the needs and aspirations of local people. In this way, biosphere reserves provide a practical framework for galvanizing human investment and creativity toward a more promising common future.

OCEANIC WILDERNESS SEMINAR

Program Leader: Dr. Nancy Foster, Director, Protected Species and Habitat Conservation, Marine Estuaries Management NOAA-NOS, 1825 Connecticut Avenue, #174, Washington, D.C., USA 20235. Coleaders: Michelle Lemay and Annie Hillary, NOAA-NOS; Graeme Kelleher, Great Barrier Reef Marine Park

Authority; and, Harold Eidsvik, Parks Canada.

Seventy percent of the globe is covered with water, but less than 1 percent of that is included in marine-protected areas. Seventy percent of our oxygen is produced by marine phytoplankton, 70 percent of our population lives within 60 miles of the coastline and more than half the population in developing countries receives almost 50 percent of its animal protein from marine fisheries, yet little attention has been given to marine conservation.

After prompting by the World Wilderness Congress, an emerging debate on marine wilderness areas represents an important step in marine-resource management. The symposium considered several preliminary aspects:

- There is no reason why the concept of wilderness could not apply to the marine environment. The symposium's preliminary definition of such wilderness is: "Marine areas where little or no persistent evidence of human intrusion is present or permitted, so that natural processes will take place unaffected by human intervention."
- Even without this definition, there are examples of countries throughout the world that have designated areas that, in essence and probably in fact, would qualify as wilderness.
- Wilderness is at the highly protected end of the spectrum of protected marine areas, and is but one component in the broader framework of integrated marine conservation.
- These most highly protected marine wilderness areas should not be viewed in the negative sense—as places where resources are locked-up—but in the positive sense as a means to long-term replenishment of overexploited resources. They would be management models to assist in sustaining natural resources.
- Natural resource, economy and social systems are all interrelated; sound marine conservation will never be accomplished if one depends on only scientific data and ignores economics and people.
- Other aspects that are important to the concept of oceanic conservation include local marine-management projects on developing islands; voluntary conservation programs along the coasts of England, (managed without enabling legislation); the establishment of an extensive marine estuaries park in the Waddensea; and Antarctic wilderness, which is seriously threatened through unregulated fisheries, mineral exploration and development.

The concept of oceanic or marine wilderness is at the same place now as was that of terrestrial parks and wilderness one hundred years ago. An inadequate international framework for defining ocean wilderness, as well as a lack of institutional capability to protect ocean areas which may meet any set of defined criteria, are two specific shortcomings for protection of oceanic wilderness. The next step will be at the 1988 IUCN General Assembly in Costa Rica during which, at the meeting of the Commission on National Parks and Protected Areas, the concept of global marine wilderness will be discussed.

The content of the science program reflected the stature of the leading scientists present, and the proceedings will provide contributions advancing several fields of inquiry. The integration of science and scientists with other conservation disciplines was most striking. The synthesis between art and science was described by Dr. Joe Passineau, one of the science symposia leaders, as a merging of matters of the heart and matters of the head:

"Art and science applied to conservation have the same destination. Art, through the emotions, takes you there in a heartbeat, while science goes step-by-step, tracking the evidence patiently from source to distribution, and proving that which art, tracking through the heart and emotions, knew instantly. Each path of knowing is essential for the validation of the other. Together they create a balance, and in the center of that balance is truth. So it has been with integration of science and conservation at the 4th World Wilderness Congress."

THE ARTIST AND THE WILDERNESS ETHIC

David M. Lank

The famous English critic John Ruskin was inspiringly perceptive when, in the nineteenth century, he wrote: "Great nations write their autobiographies in three manuscripts: the book of their deeds, the book of their words, and the book of their art. Not one of these books can be understood unless we read the two others; but of the three the only trustworthy one is the last."

Future generations will judge us by our attitudes toward wilderness not only by our words and deeds, but also by our art. Artists therefore have as vital a role as any other person in giving tangible and lasting form to the wilderness ethic on which our survival as a world will increasingly depend.

At the 4th World Wilderness Congress, it was recognized that the artist has as much right to have input in discussions on the crisis of wilderness as does the scientist and the politician, the hunter and the conservationist. With the passage of a few months, I realize that what I should have said was, "The artist has as much OBLIGATION to have input" as any of the others.

Few artists make any real effort to have input. We see staggering amounts of wildlife art; we see very little wilderness art.

With the passage of the centuries we have witnessed an evolution of animal

art that has sprung from totemic and magical inspiration, through an emphasis on animals in the service of man, with the pious blessing of Genesis I:28, through stiff scientific portraiture, down to our contemporary idolatrous worship of frozen detail. Overwhelmingly, today's artists are painting photographs, and art is suffering.

But artists—and their promoters—howl when the photographic stigma is leveled at their work. And yet, check for yourselves the number of times attention is called in promotional texts and self-laudatory articles to the "unbelievable," "extraordinary," "incredible" detail in so-and-so's work. By inference, the more detail the better the quality of art.

In 99 cases out of 100, it isn't art. It's photography—and bad photography at that. Any artist who has mastered sufficient technical training to put paint on canvas has the requisite skill to paint a photograph. Whether or not an actual photograph is used as the "inspiration" for a particular painting is not relevant. How else, other than in a photograph, can you capture in steel-edged detail every pinnion of a duck exploding off yet another pond? You certainly can't see such detail in real life, so why is minute detail referred to as "lifelike?"

To contradict my last statement, there is another way of seeing such detail. The word in French for a still life is *nature morte* directly translated, dead nature. Fifty million Frenchmen can't be wrong. The kind of detail we see in certain very successful and popular moose paintings can only be captured first on film, or sitting in front of a stuffed animal, gazing blindly through the dust slowly gathering over its glass eyes. You don't see that kind of detail in a Runguis; instead, you see the wilderness.

The current mania for animal portraiture is all too often a two-dimensional equivalent of a stuffed trophy over the fireplace. Both are monuments to the dead—inanimate but detailed. Life for a wild thing is not just a matter of breathing; they can do that in a zoo. Life only takes on its real meaning in wilderness. It is as if a portrait has been painted on a single piece of a giant jigsaw puzzle, and that one piece—a piece of animal art—is now deemed an end in itself. If the whole puzzle were looked at, that piece would be missing and we would spot it immediately. But when we look only at the piece, we seem oblivious to the fact that the whole puzzle is missing. That puzzle is wilderness.

As an investment counselor, part of my training is to try to anticipate trends before they become obvious. In the buzz words of my profession, I try to discount the future. Let me discount the future of animal art. I am predicting that, in spite of booming sales figures, startling secondary market prices and a proliferation of wildlife galleries and publications, animal art as currently practiced by the vast majority of wildlife artists is basically dead.

Why? Because it is basically photography, and photographers are doing it better. At least they make no pretense of being anything other than photographers, some of whom have raised the level of their craft to the stature of art. For most people, however, photography is not considered to be art. Thanks to the sophistication of today's cameras and long lenses, we all get the feeling that if

only we had had the time to climb Mount Washington on a frosty morning at the right time, we too could have taken that perfect picture of the sunrise through the frost crystals. Through the sheer weight of numbers, with hundreds of millions of pictures being taken per year, some of the best pictures are going to be taken statistically by rank amateurs. There is an understandable tendency to consider photography more a question of timing than of talent. There is hope for us all; it is not inconceivable that every one of us could have a photo selected by Audubon Magazine.

What a significant thing it is that the photo editor of Audubon Magazine—with perhaps the most consistently stunning selection of pictures in print—has authored a long-overdue book on an artist who, half a century ago, proved that photographic detail is not an automatic criterion for excellence. Marty Hill, first in her own article in Audubon three years ago, and now in her book, *The Peerless Eye*, forces the art community to confront the towering genius of Bruno Liljefors, Sweden's incomparable gift to wilderness art.

Liljefors, I predict, will no longer by considered the past: He will be seen as the future. If this comes true, it will be not an evolution but a revolution—a turning back again—to the whole puzzle, to the wilderness ethic. Compare his loons with the latest limited edition art prints; compare his eiders with the usual duck stamp offerings.

My reference shelves are lined with coffee table books on "The Art of. . ." and you fill in the blank. They tend to share certain things in common. First, they were all written too soon. Secondly, they are flatteringly uncritical and usually written by someone who knows little about art or its history, but who obviously "knows what he likes."

Why are the artists only making statements about their art, rather than making a statement about the wilderness through their art? An exception is Paul Bosman, who has done it with his spectacular book on African elephants, in an appropriately large format, but which contains paintings of elephants no more than fractions of inches long in a vast environmental setting—the piece properly placed in the whole puzzle.

There are other artists who paint the whole puzzle. I name names because I feel their work should be seriously examined not just from a technical viewpoint, but from the perspective of the underlying ethos: Lanford Monroe, George McLean, Bob Kuhn, and Sweden's new Liljefors, Lars Jonnson.

There are others—many others—who could paint the whole puzzle. If artists are going to have a voice in the forming of a viable conservation and wilderness ethic, then they must do it.

FOLLOW-UP

ART AND CULTURE: International Leadership Foundation, c/o Fulcrum Inc., 350 Indiana St., Suite 510 Golden, CO , USA 80401

RESOLUTIONS

Resolutions passed by the Plenary Session of the 4th WWC:

Following are Resolutions titles and sponsors. For more detailed information and to assist with the implementation, please contact the person and/or organization listed.

Group A—Achieving Sustainable Development

WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT

1. Report of the World Commission on Environment and Development. Global Tomorrow Coalition, 1325 G St. NW, Suite 915, Washington, D.C., USA 20005
2. World Conservation Strategy; National Conservation Strategies. IUCN, National Conservation Strategies, Dr. Kenton Miller, Avenue du Mont-Blanc, CH-1196 Gland, Switzerland
3. International Conservation Banking Programme or Facility. Michael Sweatman, IWLF, c/o World Resources Institute, 1735 New York Ave. NW, Washington, D.C., USA 20006
4. Population and Environmental Stress. Rupert Cutler, Population-Environment Stress Inc., 1325 G St. NW, Suite 1003, Washington, D.C., USA 20005

SUSTAINABLE DEVELOPMENT IN SPECIFIC REGIONS

5. Funding Sustainable Development in Tropical Regions. Sr. José M. Borrero, Fundacion para la Investigacion y Protection del Ambiente, Apartado Aereo 2741, Cali, Colombia, S.A.
6. Sustainable Development in Small Island States. Gabriel Charles, Chief Forest and Lands Officer, Ministry of Agriculture, Castries, St. Lucia, West Indies

ENVIRONMENTAL RIGHTS

7. Environmental Rights. Peter D. Glavovic, School of Law, University of Natal, Durban, South Africa

INDIGENOUS PEOPLES

8. Lands and Rights of Indigenous Peoples. Dana Guppy, Indigenia, 1314 NE 42nd, Room 208, Seattle, WA, USA 98105
9. Haida Gwaii Conservation Strategy. Council of the Haida Nation, Miles G. Richardson, P.O. Box 98, Skidegate, Haida Gwaii, Canada V0T 1S0

Group B: Increasing Support

NON-GOVERNMENTAL ORGANIZATIONS

10. World Conservation Service. Ms. Joan Martin-Brown, UNEP, 1889 F St. NW, Washington, D.C., USA 20006
11. Worldwide NGO Cooperation. Dr. Edgar Wayburn, The Sierra Club, 730 Polk St., San Francisco, CA 94109
12. Earth Friendship Center Concept. Sarah Weaver Kipp and Clive Callaway, 621 Alexander Crest NW, Calgary, Alberta, Canada T2M 4B4

EDUCATION AND INFORMATION

13. Environmental Education and Training. For complete text and sponsors contact: IWLF, Colorado State University, Fort Collins, CO, USA 80523
14. Fund for Conservation Projects of Young Scientists and Students in Developing Countries. Arturo Gomez-Pompa, UC MEXUS, University of California, Riverside, CA, USA 92521
15. Cooperation on Use and Exchange of Data and Information. John Kineman, NOAA/NGDC E/GC-12, 325 Broadway, Boulder, CO, USA 80303
16. Conservation Inventory. IWLF, Colorado State University, Fort Collins, CO, USA 80523

Group C: Improving Environmental Management And Conservation

ENVIRONMENTAL MANAGEMENT

17. Environmental Restoration. David R. Brower, Earth Island Institute, 40 Stevenson Ave., Berkeley, CA, USA 94708
18. Pesticides, Herbicides and Sustainable Agriculture. Verne McLaren, World Wildlife Fund, P.O. Box 114, Robe, South Australia 5276, Australia
19. Waste Policy for Environmental Groups. Bill Shireman, Californians Against Waste, 8498 Sunblaze Way, Sacramento, CA, USA 95823
20. The California Recycling Act. Bill Shireman, Californians Against Waste, 8498 Sunblaze Way, Sacramento, CA, USA 95823

OCEAN CONSERVATION

21. Ocean Conservation. Dr. Nancy Foster, Office of Protected Resources, NOAA, 1825 Connecticutt Ave. #805, Washington, D.C., USA 20035

CONSERVATION (GENERAL)

22. Conservation on Private Lands. Kathleen Shea Abrams, National Parks and Conservation Association, Environmental and Urban Problems, Florida International University, North Miami, FL, USA 33181
23. U.S.-U.S.S.R. Cooperative Tropical Forest Pilot Project. Arnold Newman, ISPTR, 3931 Camino de La Cumbre, Sherman Oaks, CA, USA 91423
24. The Biosphere Reserve Programme. William Gregg, US-MAB Project Directorate, Depart. of the Interior, National Parks, Washington, D.C., USA 20240
25. Representation of Ecosystems in Protected Areas. George D. Davis, Wild Wings Foundation, Chevre Hill Farm, Wadhams, NY, USA 12990

CONSERVATION IN THE NEOTROPICS

26. Conservation in Jamaica. Karl Aiken, Natural History Society of Jamaica, P.O. Box 58, Mandeville, Jamaica
27. Conservation in Latin America. Frances Spivy-Weber, National Audubon Society, 645 Pennsylvania Ave SW, Washington, D.C., USA 20003
28. Protection of the Remaining Atlantic Coastal Rainforest of Brazil. Dr. Jose Pedro de Oliveira Costa, S.O.S. Atlantic Forest Foundation, Rua Conselheiro Carrao, Sao Paulo, SP 01328, Brazil
29. Creation of a Biosphere Reserve at Calakmul, Campeche, Mexico. Joann M. Andrews, PRONATURA-MEXICO, Calle 13 #203-A, G. G., Merida, Yucatan, Mexico
30. Puerto Rico and the U.S. Virgin Islands. Environmental Coalition of Puerto Rico, Ms. Cindy Gines, Calle 1 #1094, Urban Villa, Nevarez, Rio Piedras, Puerto Rico 00921

CONSERVATION IN OTHER REGIONS

31. Three Gorges Dam, China. V.C. Mohan, Asia-Pacific People's Environment Network, Sahabat Alam Malaysia, 37 Lorong Birch, Penang 10250, Malaysia
32. The Cairngorms Scotland Establishment of a World Heritage Site. Ian S. Gardiner, The Braids, 13 Tudor Drive, Otford near SevenOaks, Kent TN14 5QP, United Kingdom

Group D: Protecting Wilderness

WILDERNESS (GENERAL)

33. Definition and Recognition of Wilderness. Dr. John Hendee, Dean, College of Forestry, Wildlife and Range Sciences, University of Idaho, Moscow, ID, USA 83843
34. Recognition and Designation of Caves as Underground Wilderness. George

N. Huppert, American Cave Conservation Association, 1830 Green Bay St., La Crosse, WI, USA 54601

35. Desert Ecosystems. Jeff Widen, Coordinator, Desert Task Force, The Sierra Club, 3550 West 6th St. #323, Los Angeles, CA 90020

36. John Muir Commemoration and Memorial. Joe Passineau, Department of Horticulture, Forestry and Parks, South Dakota State University, Brookings, SD, USA 57007

ANTARCTICA

37. Antarctica. Jim Barnes, Antarctica Project, 218 D St. SE, Washington, D.C., USA 20003

WILDERNESS IN AUSTRALIA

38. Wilderness in Australia. Dr. Judy Lambert, The Wilderness Society, 179 Sydney Road, Fairlight, NSW 2094, Australia

WILDERNESS IN CANADA

39. Protection for the Temagami/Lady Evelyn Wilderness. Brian Back, The Temagami Wilderness Society, 204, Wedgewood Drive, Willowdale, Ontario, Canada M2M 2H9

40 Long-Term Protection for the Threatened Wilderness of Western Canada. Lisa Spellacy, Canadian Parks & Wilderness Society, RR7, Munn Road, Victoria, British Columbia, Canada V8X 3X3

41. Independent Inventory and Analysis of Remaining Old Growth Forest in British Columbia. Peter McAllister, Sierra Club of Western Canada, 2901 Seaview Road, Victoria, British Columbia, Canada V8N 1K9

42. Special Protection for Robson Bight. Peter McAllister, Sierra Club of Western Canada, 2901 Seaview Road, Victoria, British Columbia, Canada V8N 1K9

43. Proposed Khutzeymateen Grizzly Bear Sanctuary. Vicky Husband, Friends of Ecological Reserves, P.O. Box 10, Victoria, British Columbia, Canada V8X 4M6

44. Stikine Transnational Park. John J. Christian, Friends of the Stikine, 1405 Doran Road, North Vancover, British Columbia, Canada V7K 1N1

WILDERNESS IN ITALY

45. Wilderness in Italy. Bianca Vetrino, Italian Wilderness Society, Regione Piedmonte Italy, Piazza S. Giovanni 4, Torino 10122, Italy

WILDERNESS IN THE USA

46. Full Protection for the Coastal Plain of the Arctic National Wildlife Refuge. Jack Hessian, Alaska Task Force, The Sierra Club, 241 East 5th Suite 205, Anchorage, AK, USA 99501

47. Tongass National Forest, Southeast Alaska. Bart Koehler, SEACC, P.O. Box 021692, Juneau, AK, USA 99805

48. Aerojet Land Swap. Charles S. Watson Jr., NORA, P.O. Box 1245, Carson City, NV, USA 89702

ABSTRACT OF ADDITIONAL PRESENTATIONS

Philip E. Austin

In the mid-nineteenth century, the United States began to realize that supposedly unlimited natural resources and land were indeed limited. A more scientific approach to the use of resources was needed, as well as a concern by higher education for the development, transmission and practical application of knowledge to particular problems. A manifestation of this was the establishment of land grant colleges throughout the U.S. The Agricultural College of Colorado, now called Colorado State University, was created in 1870 with a commitment to the protection and wise use of natural resources, which have come to be considered the lifeblood of humanity.

We have found that protection of our lands not only adds to quality of life, but also strengthens economic stability.

The CSU College of Forestry and Natural Resources has been a front-runner in education for natural resource conservation. Since 1916, when the U.S. Congress created the National Park Service, our university has served as the principal training ground for rangers and administrators for this agency. This tradition continues today.

Colorado State University also has a rich tradition of work in the international arena. Over one-third of the faculty have had international experience, many in Third World countries providing technical assistance involving the utilization and preservation of natural resources. Almost 800 international students representing 101 countries make unique contributions to our campus life. We're also proud of our university's instrumental role in developing the Peace Corps, for which the original feasibility was conducted by researchers on our campus.

Carmen Blondin

The designation of large marine ecosystems (LMEs) is an evolving scientific and socioeconomic process. Useful comparisons may be made of the different processes which have influenced large-scale change among LMEs. Management and conservation of LMEs, responding to strong environmental signals, will be enhanced by improved understanding of the physical factors which force biological change. Current global-scale efforts to improve the information base for sustained management of LMEs is meager. We have taken steps to improve the situation over the next few years by focusing efforts on regional marine ecosystem management, based on a better understanding of the productive capabilities of LMEs.

The shift that has occurred over the past decade in the United States from single-species research to multispecies orientation is attributed in large part to the standards of the Fisheries Management and Conservation Act of 1976. In addition, the National Oceanic and Atmospheric Agency (NOAA) has been mandated by the U.S. Congress to conduct research in support of the National Environmental Protection Act, the Marine Mammal Protection Act, the Endangered Species Act and the requirements of the Marine Protected Areas Program. Given the growing interest in the conservation and management of fishery resources, along with efforts to avoid further environmental degradation and to enhance the recovery of endangered and threatened species and preserve marine areas as a human responsibility for future generations, it is both timely and appropriate to broaden the focus of fisheries research and management to multispecies studies at different levels and from an ecosystem perspective.

Dhananjayan

A traditional story of India, presented in Katakali, the classical Indian dance: A traveller in the wilderness sees a deer about to give birth and follows her to her hiding place. All at once, a barrage of misfortunes, including a hunter with a bow and arrow, a lion and a forest fire beset the deer. As the traveller, bewildered, wonders what to do, an equally bizarre stream of natural accidents rescues the deer from her plight. The traveller watches the deer give birth to her fawn and marvels at the mysteries of divine providence.

Mayor Federico Peña

While it is absolutely critical that governments at whatever level—national, regional or local—be committed to conservation, the individual has a responsibility and role to play as well. If one thinks about the individual responsibility which we can take in local and global conservation, the consequences are staggering.

Each one of us has a responsibility to conserve a resource such as water. In Denver and Colorado we live in a semiarid environment where conservation and wise use of water is a high priority. Every individual must meet that responsibility whether it is deciding how to use water in his home or deciding how to use and allocate that water resource in his business. The same is true of land use, air pollution and the well-being of our mountain scenery.

Each of us as individuals must recognize that what we do has worldwide implications. Rivers leaving our cities, states and country, carrying pollution to the oceans have global implications. Our air pollution has global implications. While government has an absolutely critical role to play, the real answer and solution will be found by individuals.

Governor Roy Romer

The State of Colorado is constantly engaged in environmental policy issues. The key issues are air quality, water rights and agricultural production. For example, within the borders of Colorado are the headwaters of some of the nation's great rivers—the Rio Grande, the Arkansas, the Platte and the Colorado. If political boundaries were meant to enhance the efficient use of these resources, then John Wesley Powell was right to suggest that Western states should correspond to river basins. But that is not what happened. Thus, we must be mindful of how the use of our water in Colorado affects the citizens of other states and other countries. An elaborate structure has emerged to ensure that we do that.

Tom Thomas

There are two main aspects which must be addressed if the dilemma of worldwide conservation is ever to be solved. The first, as emphasized and demonstrated by the World Wilderness Congress, is to develop cross-communication between sectors and professions involved in different aspects of international environment and development. It is this type of cross-pollination which yields new ideas, effective programs and eventual success in our collective efforts.

The second, equally important aspect is represented by the youth of the world. Results of all conservation efforts will be carried out by today's youth. As I travel from one country to another and visit school systems, despite the critical importance of this simple issue, I find that conservation education is one topic that is either nonexistent or offered on an elective basis. If we are to win the conservation battle—and we must—the sooner we get young people exposed to conservation education and environmental values, the more effective our fight will be. Until we develop communication and education for the youth of the world, implementing our conservation programs and sustainable development policies.

Dr. Edgar Wayburn

The American conservation movement—or if you will, the American environmental movement—has come a long way in the past 40 years. It now encompasses a great variety of issues: national park establishment and protection; wildlife protection; wetlands preservation; logging and mining on public lands; energy production and conservation; nuclear energy; clean air and water; and management practices. These are all absolutely interconnected with the great public lands issues which have been our primary focus for the past 100 years.

In the past 20 years we have broadened our concerns and involvement in the arena of our activities. One by one, conservationists and conservation organizations have realized that no matter how many battles are won on American soil, the environmental war must be fought worldwide. Americans and their organizations are progressively taking increased interest and participation in what goes on outside the United States and are urging the U. S. government to do much more on the international scene than was done in the past.

Bruce E. White

The impact of the World Conservation Strategy has been great. While the concept of sustainability had long been a part of the language of resource managers and economists, definitions of sustainability were often not compatible. By integrating economic goals with those of environmental protection, the World Conservation Strategy (WCS) has provided the impetus for a series of new efforts.

To implement the WCS, the International Union for Conservation of Nature and Natural Resources has promoted the preparation of National Conservation Strategies (NCS). There are five elements essential to creation of effective NCS:

- Tailor strategies to local conditions;
- Utilize local expertise;
- Obtain the highest level of official sanction;
- Be comprehensive; and,
- Use participatory planning.

Key questions that need to be considered by planners and participants in NCS-like efforts are:

1. How can NCS most effectively address the goals of sustainable development? Should they serve as action plans for the environmental community or as an integral part of national development policy plans?

2. To what extent must the financial and industrial communities support strategies, and how can this be accomplished?

3. What changes must NGOs make in philosophy, funding strategies, educational programs, advocacy and staff expertise to effectively implement an NCS?

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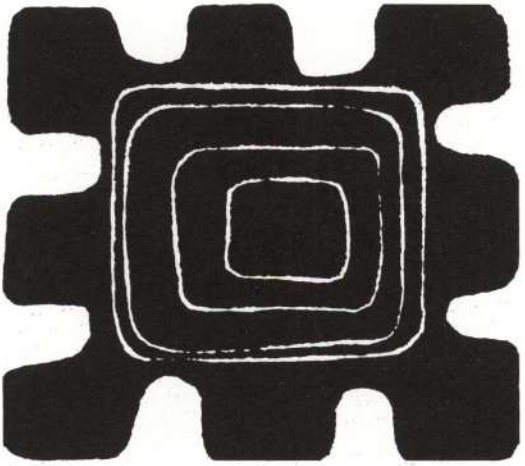

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For the Conservation of Earth

is the proceedings of the 4th World Wilderness Congress, held in Denver and Estes Park Colorado. People from 65 nations, working together, sought solutions to the critical questions of environment and human survival.

"The 4th World Wilderness Congress marks the emergence of a new alliance dedicated to finding new solutions to the problems of our earth."

— Maurice Strong

"As the world's population increases and the living standards of the people rise, pressure on the Earth's living resources and land will inevitably increase. Nature will retain its life-giving power only when forests and wildernesses are preserved. Wilderness areas are not only repositories of natural gene pools. They will also be perhaps the only places where natural changes in plant and animal species will occur. Such areas are, therefore, essential requirements for all countries, rich or developing . . ."

— Rajiv Gandhi
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