

Overview of Conservation in the Caribbean Region

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The Region and Its Diversity

In this paper, the Caribbean region is somewhat arbitrarily defined as all nations bordering the Caribbean Sea, except Mexico, which is considered essentially a Gulf nation. With a population of approximately 135 million, some 29 political entities, and 4 major languages, it is one of the most diverse regions of the world. An understanding of this diversity is central to understanding the status of conservation and the measures which are required to improve the management of living natural resources.

The cultural elements of the region (European, African, Asian, Amerindian) vary considerably as to the particular mix in any given area. In terms of language, Spanish clearly dominates and is spoken by 86 percent of the population, while French Creole (7 percent), English (5 percent), and French (1.7 percent) follow (United Nations 1977a, Rickards 1978). However, it is more significant to note that English is the official language of 15 of the political entities of the region, Spanish of 10, French of 3 and Dutch of 1.

Politically the region is composed of independent states, overseas departments, associated states, commonwealths and colonies, but the number of independent states is increasing rapidly as decolonization accelerates. The largest is Colombia (just over 1 million km²) which is more than 10,000 times larger than the smallest, the island of Montserrat (100 km²). Population density varies from the island of Barbados with 568 inhabitants per km² to Belize with 6 inhabitants per km² (United Nations 1977a). By far the greatest population densities are found on the islands of the Lesser Antilles.

Resource endowments of the region are extremely varied. Oil is exported by Venezuela and Trinidad. There are 56 large-scale mining operations in the region with 30 in the Greater Antilles. Some 50.3 percent of the region is forested, 9.7 percent is arable land, 22.7 percent is pasture and 17.3 percent is other (FAO 1976). Again each country varies considerably, e.g., Barbados has about 77 percent arable land while Belize has 1.4 percent.

Contrary to what is found in the temperate seas, the marine resources of the Caribbean are concentrated in the coastal areas. The major fishing nations of the region (Cuba, Panama, Venezuela) are much less dependent on fish protein than are the insular nations which are not self-sufficient in fish production. On the other hand, the insular nations receive the major portion of marine-oriented tourism. Indeed, the British Virgin Islands, the Netherlands Antilles, and Antigua annually receive numbers of visitors in excess of their own population (Gajraj 1978).

Finally, it should be noted that the countries with per capita incomes of less than \$500 (Haiti, Honduras, St. Vincent, Grenada, Dominica) are concentrated in the insular Caribbean where population densities are greatest (Gajraj 1978).

Some Major Obstacles to Conservation

It is commonplace to blame natural resource degradation and social and economic problems in the developing world on the uncontrolled growth of population. This is obviously a contributing factor, but of equal or more importance is the magnitude of resource consumption of the industrial countries which have about one-fifth of the world's population but consume about four-fifths of the world's resources traded through international markets (Myers 1979). U.S. per capita income is more than seven times that of the average for the Caribbean and is reflected in resource consumption, where the disparity is even more marked.

The combination of rapidly increasing demands for raw materials, generated mainly outside of the region, and the rapidly expanding population within the region result in ever increasing exploitative pressures on natural resources. The effects are large in magnitude and for all practical purposes, permanent. Although there is again great diversity in the region, deforestation appears to be proceeding at between 2 percent and 10 percent annually. This would mean that if the deforestation rate remains steady, Central America would be essentially deforested in 10 years and incredible numbers of plants and animals made extinct. Worldwide, it is estimated that from half-a-million to a million species will be extinct within 20 years (Myers 1979).

The demand, from outside of the region, for its raw materials, which causes from 40 percent to 70 percent of the region's products to be exported, are generated and effected mainly by large multi-national corporations and assisted greatly by international aid agencies. Traditionally, these agencies have funded large projects designed for short-term, high economic gains to export raw materials or semi-processed products to the industrialized nations. With the notable exceptions of U.S. AID, the World Bank, and recently the Inter American Bank, none of the donor or lending agencies requires environmental impact statements.

Perhaps the most spectacular example of the consequences of externally generated demand is the deforestation of Central America which is in large measure due to the demand for cheap beef for the hamburger and fast food trade of North America (Myers 1979). Enormous expanses of forest have been felled to make way for artificial pasture for beef herds. Since 1950, the area of man-established pasturelands and the number of beef cattle have doubled in Central America. However, the beef does not go to improve the protein intake of local populations, but rather to assure low prices for hamburgers in the U.S. and Canada. The same is true in the marine area where lobsters, turtles, and conch have been wiped out to satisfy customers from outside of the region.

Likewise, the population increase, coupled with chronically inadequate land distribution in the region has caused the rural poor to move to ever more marginal lands, or to the cities, swelling the ranks of the unemployed. Already between 40 and 50 percent of the region's population lives in urban areas.

The occupation of marginal lands has contributed significantly to deforestation trends as well as to accelerating erosion, with all of its consequences, and the impoverishment of soils. Thus, even with an 8.6 percent increase of land under cultivation in the region during the last decade, dependence on imported food is increasing rapidly (United Nations 1980). Further, the contribution of agriculture to the Gross Domestic Product has dropped in all countries except Honduras and

Venezuela. The drop is particularly spectacular for the islands of the Lesser Antilles (United Nations 1977b).

The vicious cycle of occupation of marginal lands, loss of fertile soil, and movement to even more marginal lands is difficult to break. The movement of the poor is spontaneous and makes planned utilization of wildlands difficult if not impossible. This is especially critical since some 40 percent of the region's land still remains in a wild state. The options for land use planning are still open over large areas, but are being closed at a very fast rate.

A partial solution to the occupation of marginal lands is agrarian reform, but as long as the land-owning oligarchies of the region remain a powerful force in governments, meaningful reform will not take place. And the trend in Central America (C. MacFarland, pers. comm., 1980) and probably region-wide, is for more and more land to be concentrated in the hands of a few families.

A further major obstacle to effective conservation in the region is the lack of trained leaders in natural resource management. This is due to the poor salaries offered, the difficulty in obtaining scholarships, and the incentives offered to bright young leaders in other fields, often outside of the region. As long as this situation remains, conservation action will remain on the periphery of governmental and private interest group concern in the region. In fact, *if one factor is to be singled out as the most important bottleneck in Caribbean conservation, it is the lack of human capacity to manage.*

Importance of Caribbean Conservation to the United States

Before going into some of the recent developments in conservation in the Caribbean, it is perhaps useful to ask why the U.S. should be concerned. The central reason is the growing interdependence of the world. With each passing year this interdependence increases and the concept of national sovereignty becomes more obsolete. Events of the past few months underscore this concept and have proven how dependent the U.S. is on natural resources from outside its borders. Many of the vital resources of the U.S. come from the Caribbean and are all the more vital because of their proximity.

It is certainly, therefore, in the interest of the U.S. to assist the nations of the Caribbean on a cooperative basis to manage and conserve their natural resources and to promote conditions which enhance stability in the region and the flow of goods. This is fairly obvious. But what is less obvious, and just as true in the Caribbean as in the rest of the world, is the extent of U.S. dependence on the genetic resources, ecological systems and bio-physical processes of the region. Oil is now obvious in its importance, but much less is made of the importance of genetic resources, ecosystems, or biophysical processes because they are not a single item nor can their value be calculated. In many cases the value is not apparent or even known or, is potential and not actual. Be that as it may, the strategic importance of genetic resources, ecosystems and biophysical processes should not be underestimated. Further, most of the environmental problems mentioned in the previous section lead to the destruction of species (and thus, of genetic potentials), ecosystem stability, and the disruption of biophysical processes.

Examples are needed to illustrate this point because it is not commonly known. For this I am relying on two recently available documents. The first is a book by

Dr. Norman Myers entitled *The Sinking Ark* (1979). I would urge you to read it because of its excellent explanation of the importance of genetic resources and the factors which operate to cause the extinction of species on a scale never imagined until recently. The second, the *World Conservation Strategy* (IUCN 1980) is particularly useful for its analysis of global conservation problems and synthesis of conservation requirements and priorities.

Perhaps the best example of the importance of genetic resources is in agriculture since it comes very close to the question of national security itself. As we know, the U.S. presently is able to pay for its imported energy largely through the sale of agricultural produce, especially grains. However, agricultural production in the U.S. rests on a very narrow genetic base and is heavily dependent on foreign genetic reservoirs. The cultivated crops have such a narrow genetic base that they are highly susceptible to some form of pathogen, insect pest, or severe environmental stress such as unusually cold or arid conditions. It is known that insect pests can develop new strains to overcome the genetic defenses of plants in three to ten years. They can do the same to build up resistance to chemical toxins in as little as 15 generations. Thus, the continued bounty of U.S. agriculture is dependent on constant access to genetic materials of wild cultivars which only exist in foreign countries. What if this access were denied by a grouping such as OPEC, or if the places where this genetic material exists were to be used for other purposes and the genetic material destroyed? The former possibly is perhaps remote because of the many nations involved, but the latter is happening now.

Other examples of the importance of wild species are to be found in abundance in medicine. As many as half of the drug prescriptions in the U.S. contain a drug of natural origin. This is indicative of the present value of wild species, but the potential value is difficult to imagine. For example, a Caribbean sponge was found to yield a compound that is effective against herpes encephalitis, a deadly brain infection striking thousands yearly and for which no cure was previously known. This is of critical importance because the sponge's compound has supplied a breakthrough in the treatment of viral diseases much as penicillin did for diseases of bacterial origin (Myers 1979). Also, several seaweed species have been found to contain an active agent that inhibits the growth of two forms of virus that cause the common cold sore, a severe eye infection, and a widespread type of venereal disease. Sea cucumbers yield glycosides with anti-tumor activity. The list of examples can go on and on, not only for food and medicine, but for industrial applications as well, especially for waxes, oils, lubricants, and bioenergy. All point to the enormous value, some present but mostly potential, of wild species and genetic stocks.

To safeguard the world's priceless genetic heritage, the first and most essential step is to protect representative samples of the world's living organisms, and of the support systems on which they depend. Programs to this end are currently underway through the Commission on National Parks and Protected Areas of the International Union for the Conservation of Nature and Natural Resources, and the Man and the Biosphere Program of UNESCO. But progress is very slow, and it is obvious that the donor countries do not consider this to be a high priority item. Yet, if the security of the United States is at stake, can we afford to ignore the problem and hope it will be solved by underfunded and overburdened international programs? Rather it would seem logical for the U.S. to sponsor a major

effort, not as concessionary aid, but as a cooperative effort that is clearly in its own interest as well as that of other nations.

The interdependency of the world will not disappear no matter how hard politicians shout about national sovereignty. Species' losses in any country are a loss for all. It is estimated that at least two-thirds, and probably three-quarters of the world's species are in the tropics (Myers 1979). Where better for the U.S. to start cooperative efforts to seriously protect the world's genetic heritage than at its tropical doorstep in the Caribbean?

Recent Advances in Conservation

Progress within the Caribbean region in conservation has been uneven, but, a considerable amount has been accomplished, especially during the last five years. From the outset I should indicate that it is almost impossible to know of all the conservation activities throughout the region, so I hope you will excuse me if my remarks skip over important work with which some of you may be familiar. I am especially ignorant of activities in the northwest Caribbean and specifically exclude from my remarks the nations of Mexico, Cuba, Jamaica and Haiti.

One of the main indicators of conservation activity seems to be the establishment of national parks and protected areas, and more importantly, their effective management. The first national park in the region, Henry Pittier in Venezuela, was created in 1937. The Venezuelan system of parks was followed by that of Colombia and Costa Rica in the late 1960s. Since then, national parks and protected areas have proliferated so that presently there are some 142 legally established areas. Although precise data are lacking, it is probable that only about half of these actually have management in the field.

The parks and protected areas of the region (excluding Mexico, Cuba, Jamaica, and Haiti) as specified in national legislation, are as follows: Antigua and Barbuda—2 areas (2,500 ha); Belize—12 areas (308,459 ha); Colombia—31 areas (3,779,408 ha); Costa Rica—21 areas (198,000 ha); Dominica—1 area (6,840 ha); Dominican Republic—5 areas (219,800 ha); Guadeloupe—1 area (21,500 ha); Honduras—8 areas (1,300,000 ha); Martinique—1 area (400 ha); Netherlands Antilles—6 areas (13,500 ha); Nicaragua—3 areas (117,300 ha); Panama—5 areas (350,939 ha); St. Lucia—5 areas (2,518 ha); Trinidad and Tobago—13 areas (24,049 ha); Venezuela—18 areas (4,592,997 ha); Virgin Islands, British—8 areas (655 ha); Virgin Islands, U.S.—2 areas (6,429 ha). Together these 142 areas occupy some 10,945,294 ha, or about 4.2 percent of the region's land surface. This is just about equivalent to the size of the U.S. National Park System which occupies about 1.1 percent of the U.S. land area. It is a rather remarkable achievement for the nations of the Caribbean over a very short period of time and with very few resources. At the same time, it should be noted that there is an urgent need for the systems of parks and protected areas of the region to be modified to include full representation of the region's diverse ecosystems and better maintain the region's essential ecological processes and life support systems.

It is encouraging to note the recent trend within the region towards strategic and programmatic planning. Until recently, international assistance to conservation efforts in the region was totally sporadic, uncoordinated, and hit-and-miss. This is now changing through the development of regional strategies for conservation,

such as for the marine environment (Putney 1978, IUCN 1979) and for the Lesser Antilles (Putney 1979), and the development of a regional action plan for environmental management (United Nations 1980). Each of these efforts is an attempt to understand problems at the regional level so that attention can be focused in a coordinated manner on the most critical ones.

Another important advance has been the increased availability of training opportunities for the region's natural resource managers and conservationists. Universities in the United States, such as the University of Michigan, the University of Rhode Island, and the University of Miami, have tailored programs to the specific needs of the Caribbean region. Within the region, Costa Rica, Colombia and Venezuela now offer university programs aimed at producing qualified natural resource managers. The Tropical Agricultural Center for Research and Training (CATIE) has for the past several years had a very active Wildlands and Watershed Management Unit as part of its Renewable Natural Resources Program. The Unit has played a key role in stimulating management of wildlands in the Central American Region as well as offering graduate level and shorter term training opportunities. The Eastern Caribbean Natural Area Management Program has offered workshops in the insular Caribbean for national park planning and management and has worked directly with the governments and private organizations of the area to stimulate the management of living natural resources.

With the increased availability of training opportunities and technical assistance from a variety of sources, capable and dynamic leaders have come to the forefront in several countries. Wherever this has happened, notably in Costa Rica, Colombia, the Dominican Republic and Dominica, rapid improvement has taken place in the management and conservation of living natural resources. It is this fact that has led many to the conclusion that human capacity to manage is the critical factor in developing effective resource management programs in the region.

It is also interesting to note that active nongovernmental conservation organizations have tended to develop in those countries where effective leaders have taken over the management of living natural resources in government agencies. In most cases, these new leaders have seen the value of nongovernmental organizations and have spurred inactive organizations into more effective roles in support of management activities.

Both the CATIE Wildland and Watershed Management Unit and the Eastern Caribbean Natural Area Management Program (a cooperative program between the University of Michigan School of Natural Resources and the Caribbean Conservation Association) have been supported by the Rockefeller Brothers Fund, which has continuously funded regional conservation programs in Latin America and the Caribbean during the past decade. This support has been a critical element in stimulating action through the governments of the region, nongovernmental organizations, and international programs. Even with relatively small financial resources, the Fund has been able to generate considerable action. The key to their success has been the flexibility and pragmatism of their approach coupled with an ability to respond rapidly at critical moments.

Further encouragement is added by the U.S. Government's new directions in providing assistance to the region in environmental concerns. This is a new departure which has been caused by pressure by nongovernmental organizations in the U.S. on the Agency for International Development (AID). Their efforts have paid

off handsomely and AID has been directed by both the President and Congress to fund "environmental projects" as well as to take proper account of the environmental consequences of their other projects in the recipient countries. Specifically, AID is now funding a regional project to assess training needs within the region in wildland and wildlife management and to recommend an action program. They have also initiated major natural resource projects in Panama and Costa Rica. Others will be brought on stream within the near future.

Hindsight as a Guide to the Future

The last few years have witnessed great strides in the Caribbean towards conservation action. This period has provided a series of opportunities to test ideas and methods and to extract guidelines for future activities. I would like to suggest several that seem critical which are based on the experiences of a variety of individuals and organizations who have worked for long periods in the Caribbean region:

1. Qualified leadership at the national level is a prerequisite for long term and effective conservation action. Thus, the training of key natural resource managers should be a high priority item for international assistance.
2. Most of the already developed "technology" and methods for natural resource management are not directly applicable to the natural and institutional environment of the Caribbean Region. It is therefore critical that technical inputs from outside of the region be adapted to fit particular needs and circumstances by those fully knowledgeable about the local scene, and that local solutions be sought as a first priority.
3. Training of resource managers should be based on the experience gained from pilot and demonstration projects in the region. Thus, it is crucial for training programs to be firmly linked with on-the-ground action projects.
4. There is a continued need for nongovernmental organizations within and outside the region to pressure bilateral and multilateral development programs to integrate environmental concerns into their regular programming process.
5. There is a need for the further development of theoretical tools and practical assessment methods adapted to the conditions of the region so that conservation efforts can move toward the conservation of the biophysical systems which support and maintain development.
6. For conservation to become a part of the development process it must de-emphasize the concern for single spectacular or appealing species and emphasize concerns which orient and guide the development process in harmony with the natural and cultural environment, and acknowledge the dependencies of human and natural systems.
7. Programs of international assistance should be small in scale and not overwhelm or dominate the recipient agency. At the same time, a holistic approach should be taken so that all elements of management, such as law, policy, research, planning, field implementation, public education and training, are dealt with together as part of a single integrated process.

8. The team approach to management is essential so that a full spectrum of views and disciplines is consulted in the management process, and so that an ambience of cooperation and mediation is fostered instead of one of conflict, confrontation and competition.
9. Management must take full account of the needs and opinions of local citizens whose lives are affected by management decisions.

And finally, I would urge that we in the United States take cognizance of the importance of supporting, in pragmatic ways, the management of living natural resources in the Caribbean, not as a goodwill gesture or with an attitude of concessionary aid, but rather as an element of the United States' concern for its own, and the world's, security.

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