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# **U.S. STRATEGY ON THE CONSERVATION OF BIOLOGICAL DIVERSITY**

**An Interagency Task Force  
Report to Congress**

**February 1985**

AGENCY FOR INTERNATIONAL DEVELOPMENT  
WASHINGTON D C 20523

February 20, 1985

THE ADMINISTRATOR

Dear Mr. President:

In accordance with Section 118 of the Foreign Assistance Act, I am pleased to transmit a report on a United States Strategy on the Conservation and Protection of Biological Diversity in Developing Countries.

The report was prepared by an Interagency Task Force chaired by the Agency for International Development (A.I.D.) and is comprised of three sections. The first section describes the basis for concern over the loss of biological and genetic diversity in developing countries. The second section outlines current activities and programs undertaken by federal agencies to deal with natural resources conservation and the third section presents a U.S. Strategy for building upon those activities and programs to assist developing countries.

As the Task Force recognizes current severe constraints on government expenditures, the U.S. Strategy highlights recommendations for action by federal agencies and nongovernmental conservation organizations that can be accomplished with existing resources. The report also indicates a wide range of longer term actions to fully carry out the strategy. We hope the report will be a useful source of information to the Congress.

Sincerely,



M. Peter McPherson

Enclosure: U.S. Strategy on the Conservation and Protection of Biological Diversity in Developing Countries

The Honorable George Bush  
President of the Senate  
United States Senate  
Washington, D.C. 20510

Identical letters were sent to the Speaker of the House, the Chairman of the Senate Foreign Relations Committee, and the Chairman of the House Foreign Affairs Committee.

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## EXECUTIVE SUMMARY

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In November of 1983, Congress amended Title VII of the Foreign Assistance Act of 1961, directing the Administrator of the Agency for International Development to work with the Secretary of State, the Secretary of Interior, and the heads of other government agencies to develop a U.S. strategy for conserving biological diversity in developing countries. These amendments made the conservation of species and their habitats "an important objective of U.S. development assistance."

Acting on the new mandate, AID took the leadership in setting up an interagency Task Force to review the ease for conserving species, survey those current U.S. Government agencies' activities and programs that affect biological diversity, and devise a comprehensive strategy fleshed out with recommendations. This Task Force drew on the expertise of federal agencies, business, universities, private foundations, professional societies, international organizations, independent research centers, and environmental groups. Another reference point was the three-day Strategy Conference on Biological Diversity held in Washington, D.C. in November of 1981—the first major federal effort to create a dialogue on worldwide biological diversity.

A strong consensus emerged among the Task Force members and advisors. Their work confirmed that in developing countries valuable and productive resources—among them, tropical forests, marine and coastal ecosystems, arid and semi-arid lands, alpine zones, fresh water, watersheds, and wetlands—are generally deteriorating. Where ecosystems or species' habitats are being destroyed or irretrievably altered, the very basis of sustained economic development is at risk.

The Task Force also agreed that the loss of biological diversity in developing countries is due largely to the demands of growing populations on natural resources and habitats. These demands are exacerbated by developing countries' attempts to realize short-term economic gains, even at the cost of the long-term productivity of natural resources.

Since biological diversity is a measure of economic potential as well as genetic wealth, the Task Force's major conclusion is that *provisions for conserving biological diversity must be incorporated into development planning*. Specifically, this means that concern for biological diversity should be an integral part of all development programs. But, the broader overriding imperative is to conceptualize and present resource-conservation needs in terms of interactive political, social, eco-

nomie, cultural, and ecological factors rather than in terms of discrete sectors, problems, or disciplines. Indeed, the binding thread that makes a unified strategy of the Task Force's diverse recommendations is the integration of conservation and development programs, of disciplines and sectors, and of international assistance efforts.

Currently, conservation planning is done mostly on a piecemeal basis. Neither in the field nor in Washington are various agencies' conservation objectives and activities coordinated and integrated fully enough to optimize their effects. Other barriers are posed by scarcities of financial resources, clashes between developing-country and development-agency priorities, and the sovereign rights of nations to control their own resources. Thus, the effectiveness of U.S. assistance to developing countries depends on how carefully the United States attunes its national goals, policies, and commitments to preserving diversity in the developing world with those of the countries in which species are rapidly disappearing.

Today, the United States sponsors more than 700 projects and activities that help conserve biological diversity. The *Agency for International Development* runs 253 projects. Some have direct effects (among them, research on biological diversity and genetics, planning and managing protected areas, conservation education, and forestry research) while other (including institution building, environmental protection, and agricultural research) have more indirect impacts. The *Smithsonian's Tropical Research Institute* in Panama and the *National Museum of Natural History* (also part of the Smithsonian) both study many aspects of biological diversity. The *U.S. Fish and Wildlife Service* participates in at least 37 international conventions, laws and in the promulgation of and treaties related to international wildlife conservation; it also runs special programs on important U.S. species and manages biological diversity conservation projects in numerous developing countries. The *International Affairs Office of the National Park Service* works closely with counterpart agencies abroad to provide information, training advisory services, and ongoing support. The *Department of State's* activities in this field include law enforcement, legal guidance, compliance with treaties and conventions, work with multilateral organizations, bilateral arrangements with developing countries, species listing, and wildlife surveys and conservation reports. The *Man and the Biosphere Program*, a 104-nation effort coordinated by the *Department of State*, involves the *Departments of Interior, Agriculture, Commerce*, and others in developing sustainable land-use strategies and an international network of biosphere reserves. The *National Science Foundation* funds research in biotic systems and resources, ocean sciences, and international programs. The *Department of Justice* conducts an international wildlife-trade enforcement program to increase the efficiency with which the United States enforces international laws and conventions on commerce in wildlife. The *U.S. Army Corps of Engineers*

conducts environmental assessments of overseas development projects. The *Environmental Protection Agency* investigates ways to preserve native fish, unique vegetation, monitor water pollution, and protect biological diversity. The *Department of Agriculture* runs programs aimed at uncovering new genetic sources of raw materials for industry and medicine, and it manages forests, rangelands, and watersheds. The *National Oceanic and Atmospheric Administration* (within the *Department of Commerce*) is developing scientific information on managing estuarine, coastal, and marine ecosystem. Finally, the *Peace Corps* provides programming and training assistance in forestry, wildlife monitoring and management, and the management of national parks, preserves, and reserves.

The main conclusions to be drawn from a review of this wide range of current activities are that: (1) the U.S. government is already making a considerable contribution to the preservation of international biological diversity; and (2) significant additional impact can be achieved through greater efforts to incorporate biological diversity concerns into existing programs. U.S. agencies have untapped potential in research, management and training. Cooperation among agencies is extensive but could be significantly improved.

The Interagency Task Force on Biological Diversity has organized its recommendations into seven major strategy elements:

1. Continue an ongoing policy dialogue within federal agencies and with developing countries on biological diversity, and helping them establish and implement national policies for conserving, managing, and developing genetic resources.
2. Through education programs in developing countries, increase public awareness of the need to conserve biological diversity.
3. Strengthen developing-country conservation institutions and increase conservation training.
4. Support research related to biodiversity conservation and inventories of species and ecosystems.
5. Promote balanced resource management and the designation and maintenance of protected areas.
6. Encourage developing countries to recognize the effects of and deal with human population pressures on natural resources.
7. Increase coordination among development assistance agencies and support nongovernmental conservation organizations.

A total of sixty-seven recommendations for action are identified by the Task Force. These are grouped in three categories within each of the seven strategy elements: policy and legislative actions; activities to be implemented within presently programmed resources; and long-term recommendations. The Task Force recognizes the current severe constraints on government expenditures and that this will affect the

extent to which its recommendations can be implemented, or the time frame in which specific actions would be taken.

A strategy for helping developing countries conserve biological diversity should not be confused with a national conservation strategy for either the United States or any individual developing country. Instead this strategy calls for the U.S. to act as a catalyst to stimulate national programs. It also calls for better coordination and planning among government agencies leading to a comprehensive program structure, and modifications in support for integral program components. Already the interest in conserving biological diversity is on the rise in the developing world, and the United States possesses most of the expertise, programs, and planning and management capacity needed to carry out the Task Force's recommendations.

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# I. INTRODUCTION: THE CONSERVING OF BIOLOGICAL DIVERSITY IN DEVELOPING COUNTRIES

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Biological diversity, both genetic and ecological, encompasses all species and ecosystems. It is determined by the number and varieties of species in an ecosystem, their genetic makeup, and the distribution of various organisms up and down the food chains. In many ways our most fundamental natural resource, biological diversity is the deep and largely unexplored pool in which new foods, fibers, fuels, chemicals, medicines, pharmaceuticals, herbicides, insecticides, and raw materials for industry will be discovered. The World Conservation Strategy released four years ago called biological diversity "both a matter of insurance and investment. . . . a buffer against harmful environmental change and as the raw material for much scientific and industrial innovation—and a matter of moral principle."

Although human survival and sustainable development depend on biological diversity, this resource is being destroyed or depleted at an alarming rate. At the same time, human populations and demands for new products based on biological wealth are growing rapidly too. Thus many recent reports warn of human threats to vital natural systems—agricultural lands lost to urban sprawl and degradation, coastal and freshwater systems destroyed by mismanagement and pollution, diverse cultivated species replaced by monocultures, losses of still-to-be-developed natural products, losses of wild species through habitat destruction and overexploitation (and to competing species introduced by man), and deforestation, which results in siltation, loss of soil fertility, and flooding. These reports indicate that if land degradation and forest clearing continue, almost one-third of the world's arable land and one-half of the productive tropical forest that has yet to be logged will be destroyed in the next 20 years. During this period, world population is expected to increase from just over 4.7 billion to over 6.6 billion—enough to shift demands for arable land and natural resources dramatically.

Threats to biological diversity warrant global concern. Recognizing as much, the United States has promoted environmental assessment and concern at home and abroad. Key among such efforts was a three-

day Strategy Conference sponsored by the Agency for International Development, the Department of State, the Department of Agriculture, the Department of Commerce, the Department of the Interior, the Council on Environmental Quality, the Smithsonian Institution, the National Science Foundation, and the U.S. Man and the Biosphere Program in November of 1981. Some 300 policy, managerial, and technical personnel from U.S. Government agencies, Congress, university and business communities, environmental organizations, private foundations, international organizations, and other countries attended.

The two most important of the conference participants' many conclusions and recommendations focussed on developing a U.S. Strategy. The consensus was that:

1. All development plans should contain provisions for protected areas, as well as specify methods and techniques for sustainable agricultural, forestry, and fisheries production.
2. An Interagency Task Force on the Conservation of Biological Diversity should be established to review current programs, develop comprehensive long-term U.S. goals and strategies for maintaining biological diversity, and recommend integrated national and international programs for carrying out the strategies.

In 1983, another important step was taken when Congress directly addressed the need for conserving diversity. Under Title VII of the "International Environment Protection Act of 1983," the President is now authorized to help countries protect habitats and develop sound wildlife and plant conservation programs. Special efforts are to be made "to establish and maintain wildlife sanctuaries, reserves, and parks; to enact and enforce anti-poaching measures; and to identify, study, and catalogue animal and plant species, especially in tropical environments."

When it added Section 119 to the Foreign Assistance Act, Congress also followed the recommendation of the 1981 Strategy Conference on Biological Diversity by Interagency Task Force to prepare a U.S. Strategy for strengthening conservation efforts in developing countries. It made AID the lead agency, and AID Administrator M. Peter McPherson invited policy-level representatives for the Task Force from the Departments of State, Interior, Agriculture, Commerce, Defense, Justice, and Health and Human Services, the Council on Environmental Quality, the Environmental Protection Agency, the Smithsonian Institution, and the National Science Foundation. Dr. Nyle C. Brady, AID Senior Assistant Administrator for Science and Technology, chaired the Task Force with a Secretariat coordinated by Dr. James Sherburne, an advisor from the U.S. Fish and Wildlife Service assigned to AID's Office of Forestry, Environment and Natural Resources.

A new strategy could not be developed—much less implemented—unless both public and private institutions were involved. Thus, the Task Force Secretariat set up several Interagency Technical Working

Groups and invited U.S. Government agencies (including USAID field missions), universities, business, private foundations, professional societies, and international organizations to participate. Numerous Washington-based non-government organizations also created a Biological Diversity Working Group, chaired by Russell Train, President of World Wildlife Fund-U.S., to channel information to and from the broader scientific and conservation communities. The World Wildlife Fund-U.S., the National Audubon Society, the Ecological Society of America, the Natural Resources Defense Council, Sierra Club International, National Wildlife Federation, and World Resources Institute (WRI) joined this group, which maintained close ties to both the Interagency Task Force and other nongovernmental organizations (NGOs).

Complementing this effort, the World Resources Institute sponsored a one-day workshop in June of 1984 on conserving biological diversity. The dozen or so eminent scientists and conservationists who attended made recommendations that WRI later incorporated into a report that outlines policy and program initiatives for U.S. Government and private groups.

To round out participation, the Task Force Secretariat Coordinator also solicited the views of international organizations, including the United Nations Environment Program (UNEP), the World Bank, the Food and Agriculture Organization of the United Nations (FAO), the United Nations Development Program (UNDP), and the International Union for Conservation of Nature and Natural Resources (IUCN)—the co-sponsors, along with the World Wildlife Fund-U.S., of the World Conservation Strategy.

From all these groups, public and private, four broad concerns emerged. Three focus on integration—of (a) conservation and development programs, (b) disciplines and sectors, and (c) international efforts. The fourth is that developing country governments participate actively in conservation schemes from the earliest stages of planning.

As these concerns indicate, economic development assistance and the sustained productive use—that is, conservation—of natural resources are intrinsically linked. Growth cannot be sustained at the ultimate expense of species, habitats, and the environment of which they are part. U.S. development assistance objectives and their instruments—training, technology transfer, education, institutional development, research and monitoring, environmental planning and protection, policy dialogue, and private sector development—must thus be revamped to incorporate the sustainable use of natural resources and the protection of biological diversity. Beyond that, national and regional efforts in all countries to integrate conservation and development must be fortified. Today, most such efforts are fragmented, divided among programs in forestry, agriculture, wildlife, fisheries, livestock, and the like.

This piecemeal approach is mirrored by most U.S. development-assistance programs. As a result, there is little cross-sectoral planning,

efforts are often duplicated needlessly, competition for funds is stiff and counterproductive, and some conservation efforts actually interfere with the integration of national development and conservation objectives. Clearly, a primary need is for U.S. agencies and organizations to improve coordination and integration of natural resource-management efforts and programs in developing countries.

Time is required to deal with conservation problems—time for institution building, establishing a policy dialogue, planning, education, training, and research. Since there are no quick fixes, the U.S. must use existing resources and mechanisms to best advantage now and greatly increase its commitment to helping developing countries integrate conservation and development. Yet, while the U.S. Government has a clear interest in responsible development, it is not the only actor on the stage. International organizations, other developed countries, and above all the developing countries themselves have important roles to play. Financial resources are scarce and each country's conservation and development priorities differ. Moreover, as sovereign states, developing countries may or may not wish to draw upon the United States' resource-management expertise.

These facts and constraints underscore the importance of integrating international conservation activities. Among other things, developing countries must be consulted in time to ensure that their interests, policies, and commitments are compatible with assistance efforts. Unless differences are ironed out early, assistance efforts will surely fall short of needs.

In the current institutional setting, it is easy to lose sight of the underlying biological necessity to safeguard diversity. Yet, a lack of consensus is not the problem. The Task Force members have agreed that the key to protecting genetic diversity is protecting ecosystems, habitats, and species. In practical terms, a strategy for maintaining biological diversity must integrate land-use planning, resource management, and rehabilitation. Both population pressures and basic human needs for resources must be taken into account as well.

For the most part, the means for helping developing countries preserve biological diversity already exist. Through development assistance mechanisms and international scientific exchanges, federal agencies, universities, and private and international organizations can do the job. As the following review of federal efforts indicates, the overriding needs are to enhance and integrate current activities, most of which are or can be highly effective.

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## II. CURRENT U.S. GOVERNMENT ACTIVITIES IN BIOLOGICAL DIVERSITY CONSERVATION

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Numerous U.S. Government agencies conduct or support over 700 projects that improve the conservation and use of regional and local natural resources. (See Table 1.) Such activities as managing protected areas, training technical resource managers, collecting and storing germplasm, conducting biological inventories to classify species or to identify critical areas, carrying out basic research on species or ecosystems, and implementing international treaties and conventions all directly contribute to the conservation of biological diversity. Indirectly training programs, institutional building, conservation education, environmental profiles and assessments, land-use planning, and support for international conservation programs and organizations also help.

Although the sponsoring agencies categorize projects that directly or indirectly deal with biological diversity according to their principal focus, many span several categories. For example, a "technical orientation exchanges" project in India supported by the U.S. Fish and Wildlife Service (FWS) involves training, information, basic research, wildlife and plant management, and state-of-the-art technology transfer. Similarly, an AID-supported project to establish grain amaranth as a crop involves expanding the use of the existing germplasm collection, training cooperative researchers, developing improved locally-adapted varieties through breeding, and exchanging information.

One problem with assessing whether 700 projects is too many or too few is that the number of projects does not necessarily reflect agencies' total expenditures on biological diversity or the level of cooperation among agencies. Some projects reported by the U.S. Fish and Wildlife Service and the National Park Service (NPS) are supported by excess foreign currency programs. Several of the Smithsonian's research projects are funded through grants from the National Science Foundation and the National Institute of Health, and AID funds several National Park Service projects. In many of the larger and more expensive projects, the biological diversity component comprises only 5 to 10 percent—or even an undetermined portion—of the activities. In contrast, several smaller projects focus exclusively on conservation or protection of diversity. To further complicate an accurate assessment of the overall

**Table 1**  
**U.S. Agency Individual Projects Reported as having a Biological**  
**Diversity Conservation Component**  
**(Total Project or Subcomponent)**  
**by Category of Principal Project Focus**  
**(Many projects cut across several categories).**

	AID	SMITH- SONIAN	NSF	FWS	NPS	EPA	COE
1. Agricultural and germplasm	77	—	10	6	—	—	—
2. Wildlife and wild plant research and manageme. .	10	100 +	60	31	6	—	—
3. Conservation education and re- source training	8	30 +	—	17	32	—	—
% Of All Project							
4. Freshwater and marine Activities By							
fisheries research	7	35 +	25	2	2	—	—
Biogeographic							
5. Environmental and land-use Zone (estimate)							
planning and protection	46	—	10	4	11	1	—
6. Forestry and agroforestry	48	—	20	—	—	—	—
7. Protected area planning and man- agement	9	—	1	—	19	—	—
Humid tropics 55							
8. Biological inventories							
Arid/semi-arid 30							
and assessments	23	25 +	50	17	2	—	1
Coastal marine 10							
9. Resource management and							
High altitude 5							
institutional building	25	—	14	—	10	—	—
10. Family Planning	21	—	—	—	—	—	—

effort, biological diversity is difficult to quantify, which makes the impact of a project also difficult to quantify. Thus, estimating the precise total that the U.S. Government spends on biological diversity conservation efforts in developing countries is difficult.

Another problem with looking at lists instead of the big picture is that lists reveal little about agencies' capabilities versus actual use of programs on an international level. In particular, many domestic agency programs have developed effective methodologies that could be but are not used to help conserve biological diversity in developing countries. Also many agencies, especially domestic land-management agencies, lack the authority to engage in international activities. Treaties and conventions can focus on the need to undertake specific projects on, say, endangered species or World Heritage sites. But they do not give agencies the authority to carry out regular programming activities in biological diversity conservation.

Overall, the Government agencies that reported projects dealing directly or indirectly with biological diversity conservation in developing countries also clearly recognized the need and strong interest for additional conservation activities and incorporating biological diversity conservation into current and planned projects.

Following are brief descriptions of several federal agencies' program focus dealing with biological diversity conservation. Each agency's activities are not treated comprehensively, but the scope of current involvement is outlined and illustrated. For a more detailed account of agency activities concerned with wildlife and natural resource conservation see the concurrent report to Congress by the Departments of State and Interior on "International Wildlife Resources Conservation: Policy Review."

## **Agency for International Development (AID)**

Beginning in 1977, various amendments to the Foreign Assistance Act of 1961 authorized AID to help establish and strengthen developing countries' ability to protect and manage the environment and natural resources. These amendments have focussed on maintaining and restoring of land, vegetation, water, and wildlife. They also direct AID to consider and evaluate the environmental impacts of development projects. More recent amendments direct AID to pay particular attention to forestry research and management, improved energy and fuelwood supplies, wildlife, and protected areas.

In late 1983, AID adopted a Sector Strategy in Environment. In early 1984, it adopted a Forestry Strategy as well. Both strategies refine and improve AID's methods for planning and implementing sustainable development programs with the ultimate goal of promoting long-term economic productivity. The strategies emphasize plant-conservation and wildlife-management programs, practical forestry, biological invento-

ries, land-use classification, distribution studies of trees and wildlife species, and the use of ecological data to help preserve habitats and to maintain biological diversity.

The Environmental Strategy AID adopted has six mutually reinforcing components for implementation: environmental analysis, improving host-country environmental policy, building human and institutional capabilities, technology and information transfer, environmental research, and cooperation with other donors. How these are applied depends on each country's needs.

The Forestry Strategy focuses on many activities to achieve its objectives. They include drafting land-tenure and forestry legislation, strengthening forestry institutions, building and fortifying mutually supportive relationships between forestry and agriculture, meeting needs for energy and multi-purpose products, launching agroforestry and watershed-management programs, and integrating education and extension.

At present, USAID Missions and Offices report that some 253 projects deal with biological diversity. Those few that focus most directly on biological diversity are biological and genetic research (sponsored by AID's Science Advisor's Office and the Bureau of Science and Technology), protected area planning, management, and education (Mission projects and projects managed through arrangements with other federal agencies and host-country organizations), and forestry research (sponsored by the Regional and Central Bureaus, and through arrangements such as the USDA AID Forestry Support Program). In most projects reported, however, biological diversity is incorporated only as a component in such activities as agroforestry, agricultural research, institution building, regional and rural development projects, and land-use planning and environmental protection. Thus, the number of projects listed may give a misleading idea of AID's current direct involvement in activities aimed at protecting biological diversity.

Most of the International Agricultural Research Centers (IARC's) sponsored by the Consultative Group for International Agricultural Research (CGIAR) and to which A.I.D. provides major support are active in the collection, evaluation, utilization and preservation of genetic resources. A pivotal role is played by the International Board for Plant Genetic Resources (IBPGR).

The focus for the Board's effort has been on basic food crops, but its work has extended to important fruit and vegetable species as well. To achieve its goals, the IBPGR has sponsored some 250 collecting missions in over 70 countries, and has organized a network of long term, or base collection of important crops. The board has played another important role, that is to focus international attention on issues related to genetic erosion, the importance of genetic diversity, *in situ* collections and genetic vulnerability.

Several of the IARC's working on important food crops have been

vigilant in their efforts to collect and preserve materials which may be discarded as farmers adopt new varieties. The International Maize and Wheat Improvement Center (CIMMYT) has developed a wheat collection of over 50,000 accessions and the International Rice Research Institute (IRRI) in the Philippines, assembled and maintains the world's largest rice genebank (60,000 accessions). The collections of the international centers are not limited to familiar crops such as wheat, rice and maize, but include hundreds of thousands of accessions, constituting major collections for crops such as cassava, yams, groundnut, sorghum, millet, barley, lentils, beans, tomatoes and others.

AID's Administrator has stated that more can and should be done to assure that all AID programs are consistent with AID's environmental policy and strategy. To do so, AID could:

- Integrate natural resources conservation activities into all its programs early in the stages of project identification and design.
- Bolster its capacity to carry out existing legislation and policies for research on and management of biological conservation within sustainable development.
- Take the lead in expanding policy dialogue on integrating conservation and development objectives.
- Effectively implement the Agency's Environmental and Forestry Strategies now.

## **Smithsonian Institution**

The Smithsonian is an established trust for the "increase and diffusion of knowledge among men." World-wide, it carries out field investigations, develops national collections and scientific research, conservation, education, and training.

The Smithsonian's Tropical Research Institute (STRI) in Panama exists primarily to increase and diffuse knowledge about the evolution, ecology, and behavior of tropical organisms. The scientists, graduate and post-graduate students, and others who work at STRI carry out several hundred projects ranging from theoretical studies of the morphology of forest structure to more applied studies aimed at quasi-domesticating such native animals as the paca and iguana as economic alternatives to clearing forests for cattle grazing.

The National Museum of Natural History's (NMNH) scientific staff study many aspects of biological diversity. These include systematic botany, zoology, and paleontology, as well as the ecology and natural history of marine systems, deserts, and tropical forests. NMNH is also involved in conservation education and applied basic biology. Two examples are attempts to increase crab population densities and to change Amazonian agricultural practices so as to conserve forests and preserve tropical biological diversity.

## **Department of Interior—U.S. Fish and Wildlife Service (FWS)**

One of the U.S. Government programs most directly related to preserving of biological resources is the Endangered Species Program, legislated under the Endangered Species Act of 1973 and administered by the FWS and the National Marine Fisheries Service of the Department of Commerce. Under this Act, the U.S. joins and complies with the 84-nation Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which helps protect species against over-exploitation in international trade.

FWS' other species-related programs include planning for national species of special biological, legal, or public importance. Through the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere and at least 35 international conventions, laws, and treaties related to fish, marine mammals (whales, seals, polar bears), and the use of foreign currencies, FWS also directs several additional efforts toward international wildlife conservation.

The FWS Office of International Affairs supports and manages numerous biological diversity conservation projects in developing countries. These include surveys and studies of threatened and endangered plants and animals, migratory species management, management recovery plans for important species, training, conservation education, state-of-the-art technology transfer, inventories and management of wetlands and other fragile ecosystems, sustained-harvest yields of game species and former endangered species, vertebrate pest control, wildlife refuge planning and management, and national conservation plans.

The FWS Denver Wildlife Research Center's Museum Section at the Smithsonian Institution provides numerous services to agencies, institutions, and individuals in developing countries. Those services relate directly to training, taxonomy, information transfer, and field research and surveys.

## **Department of Interior—U.S. National Park Service (NPS)**

The National Park Service, through its International Affairs Office, works closely with counterpart agencies abroad to provide information, training, advisory services, and ongoing activities. Many of NPS projects in developing countries are park-management plans, interpretive programs and training, surveys, technical workshops, the production of instructional materials, the establishment and management of biosphere reserves, the preparation of annotated bibliographies, and the preparation of user information and case studies for development planners.

NPS activities are world-wide in scope, although treaties, conventions, and bilateral agreements tend to concentrate activities in specific countries or regions, especially the Western Hemisphere. NPS international activities fall broadly into nine program categories: (1) Profes-

sional development of foreign nationals; (2) Peace Corps support; (3) IUCN Parks and Protected Areas Commission; (4) Bilateral cooperation; (5) Special foreign currency program; (6) Western Hemisphere; (7) World Heritage; (8) NPS AID cooperative programs; and (9) Information exchange. Besides bilateral contacts with counterpart government agencies, NPS works and communicates routinely with international organizations, domestic land-management agencies, and non-governmental conservation organizations.

The National Park Service also serves as the lead agency for the Federal Interagency Panel for World Heritage in accordance with P.L. 96-515. This panel includes representatives from the Smithsonian, DOS, NOAA, USFS and FWS. NPS shares responsibility with FWS for implementing relevant portions of the Western Hemisphere Convention, Section 8 of the Endangered Species Act, and special foreign-currency programs in Egypt, India, and Pakistan.

## **Department of State**

The State Department uses all appropriate vehicles to draw attention to the need for the world-wide conservation of biological diversity. For example, it was a leading participant on the U.S. Interagency Task Force on Tropical Forests, 1979-80, and it co-sponsored with AID, Interior, USDA, and others the November 1981 Strategy Conference on Biological Diversity. Its activities related to natural resource conservation are outlined below.

**Treaties and Conventions**—State advises and helps technical agencies implement a broad range of international treaties and conventions.

**Bilateral Activities**—State and its Foreign Service back up other agencies in wide-ranging bilateral activities with Mexico, Canada, USSR, India, Pakistan, Egypt, Argentina, Brazil, China, Costa Rica, Japan, Saudi Arabia, and Panama. These arrangements take various forms. In Panama, for instance, through the Joint U.S.-Panama Convention on the Environment, a model watershed plan is being implemented.

**Law Enforcement**—State and its Foreign Services posts help the U.S. Fish and Wildlife Service's Law Enforcement Division, Justice's Wildlife and Marine Resources Section, and the CITES Secretariat investigate potentially illegal commerce in wildlife and prosecute offenders. The Department has also helped World Wildlife Fund-U.S. and TRAFFIC-USA obtain copies of foreign laws and regulations in Latin America. The Department has provided enforcement assistance relating to trade in products or specimens of endangered or protected flora and fauna.

**Species Listing**—State assists technical agencies in consultations

related to the listing of species under CITES and the U.S. Endangered Species Act.

**Laws and Regulations**—State provides international policy guidance and testimony on current and proposed wildlife legislation.

**Wildlife Surveys and Conservation Reports**—Through Foreign Service posts, State undertakes surveys of species in countries or regions at the request of technical agencies, in anticipation of Congressional interest, or on behalf of non-governmental organizations.

### **Man and the Biosphere—(MAB)**

The Man and the Biosphere Program is an intergovernmental program that helps provide the scientific basis for harmonious relationships between people and the ecosystems upon which human livelihood and well-being depend. Launched in 1970 by UNESCO, the program involves 104 participating nations. Today, MAB provides a unique framework for regional and international cooperation in addressing interrelated environmental, land-use, and socioeconomic problems in developing countries. The Secretariat for this program is at the Department of State, but EPA, the Departments of Interior, Agriculture, and Commerce, and others participate in the program.

MAB projects focus on developing sustainable land-use strategies for particular types of ecosystems, minimizing the ecological and socio-economic effects of particular human influences (such as engineering works, pollution, and demographic changes), and developing an international network of biosphere reserves for conserving representative ecosystems as benchmarks of environmental quality and centers for research, demonstration, and training. The UNESCO MAB Secretariat coordinates many research and demonstration projects to support integrated ecosystem development in tropical Africa and Asia. The primary U.S. MAB programs relate to *in situ* conservation. These include:

1. Management of genetic resources
2. Conservation of representative ecosystems
3. Evaluation of protected areas in conserving species diversity
4. Ecosystem conservation in Caribbean Islands
5. Training for sustainable ecosystem conservation
6. Studies of traditional land-use systems, including urban systems
7. Rehabilitation of degraded ecosystems
8. Public information
9. Environmental profiles of developing countries

### **National Science Foundation—(NSF)**

NSF funds research in all fields of science and engineering through

grants and contracts to more than 2,000 colleges and universities and other research institutions. Some of the projects it supports explicitly address biological diversity while many others potentially affect it. Most programs of the first type are run through the offices of Biotic Systems and Resources (BSR), Ocean Sciences (OCE), and International Programs (INT).

The Division of Biotic Systems and Resources' objective is to advance knowledge of the attributes and interrelations of organisms in their natural environment. The Division's high-priority areas for increased research support include special challenges for research on plant biology (especially on the interactions of plants and insect herbivores) and on micro-organisms that live in plants and soils, and on characterizing the genetic and biological diversity of relatives of cultivated plants. The division is a major source of support for U.S. scientists working in the tropics.

The Division of International programs supports U.S. participation in international scientific cooperation on projects of mutual interest - seminars, short- and long-term visits, and cooperative research. One program - the Science in Developing Countries (SDC) Program - considers proposals for dissertation research related to developing country problems.

The Division of Ocean Sciences supports research to improve understanding of the sea and its relationship to human activities. Research support is provided through four programs: Physical Oceanography, Marine Chemistry, Biological Oceanography, and Submarine Geology/Geophysics. In addition, an Office of Facilities Support provides research vessels and specialized shared-use facilities support. A broad range of research topics is also being addressed in tropical marine systems, and most research is coastal.

NSF maintains that its support to U.S. scientists at colleges and universities for basic research in ecology and evolutionary biology constitutes a significant fraction of all research supported by the U.S. in the tropics. Approximately one-fourth of the SDC projects during FY 1980-83 and approximately one-third of the awards between 1971 and 1980 were related to preserving biological diversity.

## **Department of Justice**

The Justice Department has an international wildlife-trade enforcement program directed from Washington, D.C., by the Chief of the Wildlife and Marine Resources Section within the Land and Natural Resources Division. Initiated in 1979, this program helps eradicate illicit trade in rare and exotic species before the trade eradicates the species.

This program's goal is to increase the efficiency with which the United States enforces the Endangered Species Act, the Lacey Act, the Marine Mammal Protection Act, and other laws and international conventions

on the commercial exploitation of indigenous and foreign wildlife. Given the extremely lucrative markets in the United States and other developed countries, the assumption is that deterrence will come only if wrongdoers are vigorously prosecuted. The unit has a budget of \$1.2 million and a staff of 18 that coordinates the efforts of U.S. Attorneys across the country and counsels agents of the Fish and Wildlife Service, the National Marine Fisheries Service, and the Customs Service investigating the international black markets. The Wildlife and Marine Resources Section believes that by stopping the burgeoning trade in exotic birds, reptiles, and primates, it may preserve some of the gene pool in LDCs.

The Department of Justice's program cuts across several biogeographic zones, but tends to center on trade of wildlife or products from the humid tropics and the coastal marine zones.

### **Department of the Army—U.S. Army Corps of Engineers**

The U.S. Army Corps of Engineers is managed by the U.S. Army and staffed by both civilian employees and military officers. Besides constructing and maintaining military facilities in the United States and abroad, the Corps is responsible for such large civil works projects as dams, flood control, hydroelectric power, land navigation. Overall, it services some 25,000 miles of inland waterways and over 100 commercial ports. The Corps current overseas activities related to biological diversity are restricted to environmental assessments of development projects. In particular, the Corps is working with AID to initiate an Environmental Assessment of the Niger river basin in West Africa.

### **Environmental Protection Agency (EPA)**

The EPA does not administer programs in the LDCs, but may be involved in bi- or multi-lateral research or development projects in these countries. For the most part these projects involve pollution control which only indirectly affects the conservation of biological diversity. EPA is, however, currently conducting a lagoon study in Nigeria which is devoted to ways of preserving unique vegetation and certain species of native fishes, monitoring water pollution, and protecting biological diversity.

EPA also administers certain pollution control programs affecting the oceans which in turn affect the coastal environments of many LDCs. Notable among these programs is regulation of ocean dumping under the Marine Protection, Research, and Sanctuaries Act of 1972. Pursuant to section 309 of the Clean Air Act, EPA also plays a key review role with regard to the projects and activities of other federal agencies, some of which directly impact the oceans or may have other, less direct international ramifications.

Finally, because EPA is the U.S.' principal pollution control agency, it has relevant expertise and capabilities in a variety of areas which may be useful in the development of programs in the LDC's. These include:

- fate and effects of pollutants
- risk assessment and management
- pollution monitoring
- pollution abatement
- environmental protection management institutions and processes
- data collection and analysis
- protection of certain fragile ecosystems such as wetlands and estuaries
- lake restoration
- environmental impact assessment and review
- management of spills or other unplanned releases of oil and toxic chemicals

### **Department of Agriculture (USDA)**

Crop plants, domesticated animals, and microbial resources are USDA's core program subjects. The agency's interest in wild relatives of crop and domesticated animal species as sources of genes for breeding programs is expanding, and USDA has a strong interest in wild plants as potential new crop sources of raw materials for industry and medicine. USDA is also involved in the management of forests, rangelands, and watersheds and in ecosystem maintenance.

**Plants**—The USDA provides national leadership and most of the funding for the National Plant Germplasm System (NPGS), a federal-state-industry cooperative program. NPGS' mission is to acquire, maintain, and make accessible as many genes from crop plants and their wild relatives as possible. This requires studying the eco-geographic distribution or genetic diversity in genebank (*ex situ*) collections. USDA is also developing criteria for selecting natural areas for the *in situ* preservation of crop species and their wild relatives so that newly evolved products can be identified and evaluated.

The USAID supported International Board for Plant Genetic Resources is catalyzing and coordinating such crop-oriented activities worldwide. The potential to link these activities with other biological diversity conservation efforts—such as *in situ* reserves for preserving or threatened plant or animal species or habitats virtually anywhere in the world—is enormous. For both types of activities, the base requirements are site description, a species inventory, taxonomy, and the elucidation of "community structure" and species interactions.

**Animals**—The Council for Agricultural Science and Technology (CAST) will soon release a study on preserving and using animal germplasm in

agriculture. Since no U.S. or international program exists to collect, evaluate, preserve, and utilize the exotic and endangered germplasm of domesticated animals and their wild relatives, CAST's model is patterned after the national and international system for preserving plant germplasm.

**Beneficial and pest insects and micro-organisms**—More than 10,000 species of insects and mites destroy crops and forests and attack people and domesticated animals. Several hundred thousand species of insects are recognized as natural enemies of pests. Another 3 to 4 million species that are an integral part of the environment have the potential to become pests or "beneficials." Germplasm from these species is increasingly important to the agricultural research community, public and private. These species provide parent material for developing improved technology for microbiological activity (such as fermentation processes, nitrogen fixation, methane production), essential information for developing integrated pest management programs, known reference points for quickly identifying causes of disease outbreaks and screening for breeding disease-resistant varieties.

The major germplasm collections are maintained in the National Type Culture Collection, Rockville, MD, (private) and in the Northern Regional Research Center, Peoria, IL (USDA). Both insect and micro-organism germplasm collections could benefit immensely from scientific studies and the collection of species in *in situ* genebanks or habitat preserves.

**Forest Trees** Because forest trees are long-lived, emphasis on collecting and using germplasm has centered on selecting superior trees and preserving these *ex situ* as seed or *in situ* as living trees. With the increasing devastation of the world's forests, concern and support for preserving genetic diversity of tree species *in situ* is growing. State and federal forestry departments are especially concerned about tree species in the temperate and sub-tropical zones.

### **Department of Commerce—National Oceanic and Atmospheric Administration (NOAA)**

NOAA is the primary federal agency responsible for providing scientific information on managing estuarine, coastal, and marine ecosystems. The agency is involved in only a few developing-country projects that help preserve biological diversity, but it has wide-ranging expertise and facilities to bring to bear on the challenge:

- the National Systematics Laboratory
- coastal zone management and planning
- designation and management of estuarine and marine sanctuaries
- legislated responsibility for protecting marine animals

- fisheries management and research, including that on population dynamics and the effects of habitat alteration and restoration
- data collection, archiving, and synthesis
- preparation of coastal atlases and inventories
- remote sensing
- research on the effects of pollutants
- climate assessment
- extension programs to educate the public and decision-makers on scientific issues affecting management choices
- cooperative bilateral efforts

These activities may be useful in conducting training programs, identifying species, establishing critical habitats, mapping areas for land use planning, monitoring development projects, and developing and managing living resources wisely.

### **Peace Corps**

Since 1980, the Peace Corps has significantly expanded its efforts in forestry and natural resources conservation. Today, more than 500 volunteers work in some 40 countries, providing programming and training assistance. Over 150 participants from 25 developing countries have received programming assistance, and some 176 volunteers and host-country personnel have been trained in technical in-service exercises in Paraguay, Costa Rica, Upper Volta, the Solomon Islands, and Malawi. Peace Corps Volunteers and country staff help local people with nursery establishment, agroforestry, forestry extension, forest management, village woodlots, and reforestation.

Other Peace Corps activities more directly affect biological diversity conservation. Volunteers assigned to national parks, preserves, biosphere reserves, or other protected areas develop general management plans, establish and execute training programs, promote environmental education campaigns, encourage the scientific study of wildlife and habitat, manage (as well as collect and inventory) vegetation, manage ranges, and help protect and monitor endangered species.

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### **III. Biological Diversity Conservation Strategy—Recommendations for Action**

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Recommendations for action for the U.S. Strategy are presented below (in Sections III A. through G.), grouped according to the seven major strategy elements identified in the Executive Summary. Agency or organizational responsibilities for implementation of actions are identified when appropriate. The recommendations are divided into two sets:

- (1) Actions which can be taken within presently planned resources. These are further subdivided into: (a) (P) Policy and/or legislative actions, and (b) Program activities which can be carried out with existing resources. Both (a) and (b) may well require a refocusing or reorientation of efforts and programs and increased cooperation among agencies and organizations.
- (2) Longer-term actions for which resources are not presently available. The recommendations will be reexamined over the next year by all the agencies represented on the Task Force to determine more specifically when and how these actions could be implemented, taking into account resource availabilities, and agency priorities.

The recommendations for longer-term actions are set forth at the end of each strategy section.

A summary chart of all the recommendations is presented at the end of this section.

The Task Force recognizes that decisions on implementation of the various recommendations will be made on a case-by-case basis by the U.S. government agencies and other organizations identified in the text. In making these decisions, each organization will consider the relative importance of biological diversity considerations vis-a-vis other competing priorities within its own programs. These decisions must take into account current U.S. federal budget stringencies which will require some program reductions and thus limit the number of new program starts. However, since conservation of biological diversity is a long-term issue, implementation of the strategy recommendations will take place over several years.

## A. POLICY DIALOGUE AND NATIONAL POLICIES

**Issue:** Conservation and development are closely interrelated. The conservation of natural resources is an essential requisite for ensuring future development in LDC's while development, and the prospect of development, create the capacity and motivation for continuing conservation efforts through increased awareness, education, and creative new policies.

In dealing with LDC's, as a first step, the U.S. Government must utilize this strategy to assist LDC's in the conservation of biological diversity.

Policy changes needed to bring about appropriately managed systems must be discussed and established at the highest government levels. Dialogue is a most important process toward achieving those policies.

Wildlife and habitat conventions and laws are a part of this dialogue. LDC's should be encouraged to join appropriate conventions, establish laws and enforce existing treaties which protect wildlife and other biological resources.

### Recommendations:

Note: The symbol (P) is used to identify policy and/or legislative actions in the discussion below for each strategy element.

1(P) *The USG should utilize this strategy for assistance to LDC's in the conservation of natural resources. This strategy should be considered in all discussions of country development assistance strategies and of projects that could potentially impact upon biological diversity.*

2(P) *Consideration should be given to providing grant support to projects in LDC's which are judged by donor agencies as important for the protection and conservation of critical biological diversity habitat and other values, and for otherwise promoting this strategy when an LDC is unable or unwilling to obtain loan financing.*

3(P) *USG agencies should continue to adopt policies withholding support for certain types of projects that degrade or destroy fragile or protected lands. Section 7(a) (2) of the Endangered Species Act requires every Federal agency, in consultation with the Secretary of the Interior or the Secretary of Commerce, to "insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered . . . or threatened species. . . ."*

The following types of projects are likely to raise such a concern:

- conversion or flooding of moist tropical forests lands (AID policy and program guidance adopted November, 1984);
- road building through or adjacent to protected areas, especially moist tropical forests;
- hydroelectric projects that flood protected areas;

- improper use of pesticides or any project leading to hazardous levels of pollution, including industrial projects;
- projects that degrade watersheds, and
- extraction of mineral or other nonrenewable resources.

4(P) *The U.S. should effectively implement bilateral and multilateral agreements dealing with the protection of biological diversity in LDCs.* Further, the U.S. should continue to encourage LDCs to participate in treaties on natural resource conservation that address the issue of plant and animal exploitation.

5. *AID should work with other U.S. agencies to establish a system for identifying employees with experience and expertise appropriate for establishing a cadre of specialists that can assist AID in policy dialogue, analysis, and management for natural resources conservation and the protection of biological diversity.*

6. *AID should assist LDCs that wish to establish intra- and inter-governmental commissions to carry out planning, development, coordination, evaluation, and sustainability of natural resources management.*

7. *Developing countries that have laws protecting native wildlife species should be encouraged to include them on Appendix III of CITES, when they are not already included on Appendices I or II of the treaty and when specific export problems require outside assistance.* This step would simplify enforcement by consumer countries, which would then focus on whether a valid CITES export permit accompanied a shipment, rather than on a possible violation of foreign law. U.S. assistance in establishing telex links directly with appropriate agencies in exporting countries would greatly aid the import export enforcement effort.

## B. PUBLIC AWARENESS AND EDUCATION

**Issue:** Experience has shown that capacity of governments to protect and manage indigenous biological resources cannot be strengthened solely through a simple overlay of new legislation and regulation, or even management by central agencies. Where absent, an appropriate policy framework is necessary as a first step. Just as essential are education programs which build on the innate capacities of local people to appreciate and defend their own biological inheritances, and provide incentives for local manpower to undertake the monitoring and managing of reserves in a manner that conserves biological diversity. Once a populace understands the relationship between a maintained natural resource base and development, governments can more easily proceed with programs likely to achieve the desired goals of sustainable use.

Given the above situation, it seems obvious that effective conservation of biological diversity in developing countries will rely increasingly on effective demonstration of practical economic benefits to governments,

as well as to the local populations which ultimately must come to see themselves as stewards of the natural resource. Particular attention should be given to the linkage between protected area management and human needs in adjacent areas. Unless these benefits can be demonstrated, and supportive human values established, successes are likely to be temporary. The importance of USG support for education and demonstration programs in all biogeographic regions cannot be overstated.

### **Recommendations:**

8. AID Mission Environmental Officers should *identify, encourage, and support promising LDC conservation education programs and activities.*

9. *AID should be encouraged to program formal education assistance for conservation education curricula and teacher training programs in LDC educational institutions (e.g. Ministries of Education).*

10. *U.S. NGOs should provide assistance to local NGO conservation organizations that have now or desire to develop conservation awareness programs. U.S. NGOs with experience and expertise in conservation education in LDCs and that have provided effective program assistance should expand their efforts by identifying and supporting private organizations in LDCs, particularly for less formal environmental awareness programs.*

### **Longer Term**

11. *In cooperation with other U.S. agencies, AID should ascertain which LDCs desire to have a conservation education public awareness program and should then assist in designing, and implementing such programs through the domestic technical agencies and NGOs with expertise in these areas. These programs can be associated with appropriate LDC institutions and agencies, both government and nongovernment (NGO), that will:*

- (a) Focus on identifying the audiences LDCs themselves feel most important to reach, e.g. policy level decision makers and the general populace;
- (b) Be multidisciplinary and focus on issues and on problem solving rather than on natural history identification or diffuse, non-targeted public information programs;
- (c) Focus on designs and methodologies tailored to local and regional audiences using those techniques that are adaptable to available means of communication;
- (d) Address local and regional problems and concerns;

- (e) Focus on local socioeconomic and educational structures that will effectively reach targeted audiences and not simply transfer techniques established in the U.S., such as television or elaborate publications.

12. The National Oceanic and Atmospheric Administration (NOAA) should give consideration to expanding the educational capacities of the Sanctuary Programs Division to allow for greater exchange of information with marine resource decisionmakers in developing countries. This would include sponsoring an International Marine Protected Area Symposium and meeting requests from individual developing countries for technical assistance in creation of marine and coastal protection plans.

### C. INSTITUTIONS AND TRAINING

**Issue:** Governmental policies that can effect the change from natural ecosystems to intensively managed ecosystems are intimately linked to and dominated by the institutional, economic, and political structures of a nation. Many agencies are involved in the development and management of the various ecosystems and their resources, and a major problem is the lack of coordinated action among agencies with narrowly conceived missions and objectives. Baseline information required for resource management is generally sparse or absent and strategies must be developed that keep open options for settling policies. Thus a strategy is required to obtain more information which will refine policies while proceeding with development; and that requires effective institutions.

Nearly one-half of all USAID Missions surveyed by the Task Force identified the need to develop and strengthen natural resource management institutions as a top priority, and as a basic requirement for integrated planning and for management of renewable natural resources.

Training is also a key element in planning for and managing living natural resources. The establishment and strengthening of effective administration at all levels will permit a government to meet planning and conservation needs. A wide variety of training methods and approaches are available.

#### **Recommendations:**

13. *Development projects affecting renewable natural resources should include support for requisite natural resource management training.* These projects can allow for assignment of students at training centers as part of the planning process directly associated with the specific project while providing examples of the range of natural resource conservation considerations involved in development.

14. *AID should develop regular workshops for all mission staff prior to overseas assignment and periodically in the field to give the audiences a working knowledge of the importance of biological diversity and resource conservation to sustainable development.* These training programs should be incorporated into the overall AID Training Office program and should be conducted by AID Environmental Staff with assistance from appropriate technical agencies.

15. *Support of on-going training efforts in LDCs for ex situ and in situ germplasm protection should be a continual effort.*

16. *All U.S. government international exchange programs involving the mutual exchange of experts in the fields of environmental science should include, where appropriate, professionals with experience in natural resource management. The USA's Fulbright Scholar, Student and Humphrey programs should make every effort to include experts in natural resource management in the five percent of the Percy-Pell exchange increases mandated for environmental exchanges by the International Environmental Protection Act of 1983.* All USG exchange program inclusions should be consistent with regulations promulgated under Section 703 of the International Environmental Protection Act of 1983 and Section 102(b) of the Mutual Educational and Cultural Exchange Act of 1961 (22 U.S.C. 2452(b)). U.S.I.A.'s U.S. Government Exchanges coordination unit will be responsible for gathering data on all USG support for exchanges in natural resource management. These data will be included in the Coordination unit's annual report. The resource assessment activities of the East-West Center in Hawaii should be strengthened.

## **Longer Term**

17. *Long-term support should be provided to develop and/or strengthen curricula within educational institutions in LDCs dealing with ecological systems and natural resources management.*

18. *Support for existing and expanded regional training programs should be a priority for the long-term U.S. strategy.* These regional programs promote training and advisory support services to LDC institutions to develop improved management and planning. The long-term training programs for Latin America designed by the World Wildlife Fund/NPS can serve as models.

Specific training for scientists/managers should be organized through these regional centers (e.g. wildlife colleges in Africa and the conservation school in Indonesia) and through existing university programs. Scientists from U.S. universities and appropriate USG agencies could provide in-country training oriented toward specific projects while exchange programs involving universities and Federal agencies should also be encouraged.

19. *Increased support for academic programs in the U.S. highlighting the conservation and understanding of species diversity in developing countries should be given greater emphasis.* The universities in the U.S. which have programs in agriculture and natural resource management do not always provide appropriate courses that build awareness among students of the importance of protecting the diversity of species. The number of relevant resource management courses in U.S. universities is decreasing.

20. *Conservation fellowships to enable LDC professionals to study resource management at U.S. institutions and at workshops/seminars should be created and supported by conservation organizations, such as the World Wildlife Fund and IUCN, and private sector multi-national companies, U.S. universities and Government agencies.* Fellowships would allow selected individuals to participate in degree programs and workshops related to conservation including: natural resource management, conservation education, and socio-economic studies. These professionals would then return to their countries with the knowledge and skills necessary to influence resource management decision-making and programs.

21. *Consideration should be given to the expansion of FWS/NPS international training programs carried out under the Western Hemisphere Convention.* WWF-U.S. and other conservation organizations should continue to provide technical assistance for the design and implementation of Western Hemisphere Convention training programs, such as the highly successful International Workshop Series on the Research, Management and Conservation of Migratory Birds in the Western Hemisphere carried out since 1979.

22. *Natural resource management agencies and private organizations in developing countries should be developed and/or strengthened to improve their national capabilities to effectively plan and implement programs in natural resource management.*

Long-term support is needed for increasing the capacity of national service agencies in resource management. National capability must be developed to:

- a. Inventory and monitor biological ecosystems, (particularly unexploited and protected areas).
- b. Analyze, interpret, plan and predict long-term vs. short-term, and tangible vs. intangible benefits. Consideration must also be given to equitable distribution of these benefits and the costs related to ecosystem management alternatives for policy determination.
- c. Provide services to resource users in effective management of land and water resources to prevent resource degradation.

23. *Research institutions in developing countries which are concerned with natural resources and biological diversity should be developed and/or strengthened to provide the basic information necessary for effective decision making.*

Additional long-term support is needed for research and training resulting in the development of effective national research organizations. This support must be on the order of 15-20 years. A major portion of this support will have to come from external donors, i.e. MDB's, AID, UNDF, FAO, UNEP, etc., where both need and commitment by the LDC to assume such costs over the period of external support can be demonstrated, the latter should include funding for recurrent and operational costs. National research capability must be developed in:

- a. Sustainable highly productive agricultural systems including use of native species and localized subsistence economies.
- b. Sustainable, productive forestry systems, including agroforestry.
- c. Ecological communities.
- d. Resource economics and planning.

This national research capability must be integrated into the world scientific community so that informal and formal networking will allow for more efficient and effective technology development and transfer, such as strengthening existing links with International Agriculture Research Centers. The national service capability must be linked to a research base and to the country's policy makers.

Additional support should be provided through the current donor system of developmental assistance. AID should be a lead agency, but must ensure the intimate involvement of other federal agencies, universities, private organizations, and international organizations.

### **Ex Situ and In Situ Germplasm Protection:**

24A. *Preservation of germplasm requires that institutions should be developed and/or strengthened for collection, maintenance, and dissemination of genetic resources.*

Organizations such as the International Board for Plant Genetics Resources must have sufficient resources to assist LDC's:

- strengthen existing programs and, as appropriate, encourage new programs in areas of greatest genetic diversity.
- stimulate and promote the dissemination of information and material for plant breeding and other scientific activities.
- develop their capability to effectively collect, protect, and maintain germplasm from the international network.
- develop programs to preserve native species for possible agricultural and other use, or to improve strains of existing resources.

24B. *Consideration should be given to the establishment of and support for an International Board for Animal Genetic Resources (IBAGR) under the system. IBAGR would assist in:*

- identifying and cataloging breeds and or populations from all animal species that provide draft power, food, and fiber.
- identifying the diversity of genetic stocks in each species that is necessary to meet anticipated changes in animal production environments in each major ecological zone.
- organizing regional evaluation programs to identify specific breeds and populations for conservation.
- encouraging research to reduce hazards from communicable diseases and thereby facilitate safe movement of animal germplasm among countries.
- encouraging use in each ecological zone of genetic stocks that have the greatest potential for more efficient conversion of production resources into animal products. In many cases this would include research on husbandry of native wildlife species.
- sponsoring national programs to maintain genetic stocks in danger of becoming extinct that could contribute to the maintenance and efficiency of animal production systems.

25. *A core group of AID professional staff should be trained in ecology and natural resources management, particularly at the regional support office and field mission level. As AID continues to assume a major role in conservation activities, it requires adequate numbers of appropriately trained staff to work with and advise missions.*

26. *Scientists from U.S. agencies and universities should provide field training and laboratory teaching for developing country scientists and graduate students in systematic biology. Important materials, both living and preserved, plant and microbial, for collections both within the developing countries and in the developed countries should be surveyed, identified, and collected. Institutional facilities—museums, living culture collections, university research and training laboratories—would be needed to carry the surveying procedure beyond the formal collaborative phase and to strengthen the long-term capabilities of the developing countries to manage their own resources.*

#### D. RESEARCH AND INVENTORIES

**Issue:** Until a better understanding of the existence and distribution of important habitats is obtained, priorities for protection and management are difficult to establish. Likewise, little is now known about the biota in many areas of the tropics that are destined for further development. Only one out of six species have been classified, i.e., approximately one-half million of the estimated three million. A major research effort, based in respective developing countries, is therefore needed to

carry out such inventories and to establish ecosystem dynamics so that subsequent management strategies can be developed. To do so requires an interest and willingness of governments in developing countries to participate in the implementation of inventories and conduct research.

Research and evaluations of the overall distribution of valuable individual species (plants, animals, and microbes) for their potential usefulness in terms of agricultural productivity, medicines, or in the generation of foreign exchange are necessary. In addition, more detailed, systematic inventories and research programs are needed to understand and assess ecosystems to determine priority areas for protection, management, rehabilitation or development.

Another major gap in scientific information is of traditional multi-species agricultural systems. These are largely concentrated in the tropics where indigenous populations have long existed and possess considerable knowledge of how to support themselves in these surroundings. A number of plants are in effect preserved by traditional agricultural practices and represent a major reserve of species diversity. Because human populations living and relying on traditional systems are among the first elements to be disrupted through increased population pressures and development efforts, this area of study takes on greater importance.

### **Recommendations:**

27(P) *U.S. representatives to various donor agencies and international organizations such as UNDP and FAO should encourage reprogramming for research and testing of the utilization of currently unused, native species of trees shrubs. AID should also give greater attention to support for research and testing in this area.*

28(P) *Regardless of who has responsibility for the U.S. LANDSAT satellite system, the federal government should continue to support the compilation of baseline data critical to identification, selection, and maintenance of biological diversity especially in relation to habitats for parks and protected areas.*

29(P) *As it plans new agricultural projects AID should encourage host governments to carefully evaluate the comparative potential of traditional systems and the more intensive, high-yield, agricultural systems. AID Missions should incorporate requisite project design funding for such comparisons when appropriate for agricultural projects.*

30(P) *Major pharmaceutical companies should be encouraged to direct significant resources and funding to research focused on identification, chemical principles, and sustainable harvest of naturally occurring native plants that contain valuable medicinal properties. The species that have such valuable properties are disappearing at alarming rates and represent an estimated market value of between 5 and 10 billion dollars annually.*

31. *Opportunities to develop commercial markets in native species on a sustained-yield basis should be explored* (e.g., capybara as a food source in Brazil; butterflies and crocodiles in Papua-New Guinea). Small scale subsistence economies based on local wildlands products are also a possibility. This should be explored by AID Mission staff in consultation with host country wildlife and agriculture experts and technical experts from USG agencies and NGOs.

32. In cooperation with other U.S. agencies and appropriate international organizations, such as U.C.N., UNEP, and WWF, AID should *carry out a cooperative evaluation of the adequacy of coverage and the quality of protection provided for biological diversity in existing parks and protected areas, beginning with the Neotropics*. The results should form the basis for a major U.S. Government initiative to upgrade protective facilities in critical areas.

33. The United States should encourage *research on traditional agricultural techniques and the broader applications of such systems* by selected institutions, both U.S. and LDC, such as arboretums and universities.

## **Longer Term**

34. *Increased support should be provided for research on affordable energy substitutes* (both marine and terrestrial) and energy conservation in LDCs. The USG should encourage private organizations funding such research and increase support for such research in NSF (biological and sociological) and NOAA. AID should continue to tap the technical expertise of appropriate U.S. agencies, such as the Department of Energy and USDA in its energy assistance projects.

35. *Research and monitoring programs need to be developed that will provide information on management for increased productivity of nonprotected terrestrial and marine areas already in use and/or degraded, such as croplands, rangelands, timberlands, and coastal areas, including mangroves*. Research should investigate techniques of soil conservation, aquaculture, agriculture and agroforestry, including reforestation, sea grass revegetation, artificial reefs, afforestation, integrated pest management, new crops, and land uses, subsistence hunting, farming, and use of native plant and animal species. Investigation of new land uses is particularly important in returning degraded lands to productive use. Research direction should be provided by the management needs identified by individual countries. The research itself should be carried out in-country with support from AID and USDA, and expertise and training supplied by U.S. agencies and scientists such as NOAA and SCS.

36. *Increased research efforts should be focused on maintaining the integrity of protected and fragile ecosystems, such as moist tropical*

forest reserves, and on surrounding land use patterns. NSF programs should be included as well as bilateral efforts with LDCs and appropriate U.S. organizations, such as USDA, the Smithsonian, and Interior, botanical gardens and other NGOs.

37. *The distribution of critical and/or threatened habitats should be established to identify priority areas that need to be inventoried.* The USG should assist LDCs with training and technical expertise (through such programs as AID's Environmental Profiles, NPS Computagraphic Mapping, the UNEP Global Environmental Monitoring and FWS TNC floral inventory) in detailed mapping of location and coverage of critical and non-critical habitats. The USG should support an expansion of biological inventories and related studies and should encourage the combining of regional studies by U.S. agencies and international organizations. The International Board for Plant Genetic Resources can play a key role in this area. Host country participation is also critical, as is access to data.

## E. RESOURCE MANAGEMENT

**Issue:** An effective development strategy requires sound planning and management for sustained natural resource use. Many developing countries lack sufficient information on the natural resource base to implement development interventions proposed by various governmental ministries or development assistance agencies. Unless a country is able to examine appropriate alternatives and options for development which allow the ensuing political decision to be solidly based, many of the social and environmental benefits provided by natural or managed areas will be adversely affected.

Rehabilitation is often necessary to restore productivity and reduce pressure on remaining natural areas. In lands that have been impacted by man, the ecosystem that exists today may not contain the same organisms or proportions of species as they formerly did. In planning for restoration where possible and warranted, attention needs to be given to learning which species and species complexes can successfully be placed in the ecosystem and how to culture them once established. The introduction of nonnative (exotic) species must be carefully weighed, since once established, these may overwhelm the communities they invade, thus diminishing rather than restoring biological diversity.

The accelerated extinctions of species projected in the coming decades will be largely human-generated. As human populations grow and development activities expand, wild areas and habitats of many animals and native plants may disappear. Through mismanaged development, conversion and destruction of natural ecosystems, and illegal collection and trade for short-term economic benefits, wild animal and plant species populations are frequently being depleted at an alarming rate. Greater

attention is needed in the management of existing protected areas, and for the establishment of additional ones.

The natural resources critical for the daily survival of rural sector communities are simply being used beyond their inherent capacity for renewal. Such overexploitation and species extinction have far reaching implications for biological diversity.

### **Recommendations:**

38(P) *USG agencies should exercise leadership in influencing the international donor community and organizations such as UNDP and FAO to give greater attention to the potential of projects that support the use of native species and systems over projects that use exotic species and monocultures to rehabilitate or reclaim habitats.* For example, USAID in Yemen is exploring support for afforestation with appropriate, native trees shrubs that are efficient sources of renewable energy.

39(P) *The U.S. Government should carry forward the process of accession to the Convention on Wetlands of International Importance, especially as Waterfowl Habitat, commonly known as the Ramsar Convention.* The Convention offers a framework for technical information exchange, technology transfer and practical cooperation that could substantially reinforce U.S. efforts to preserve biological diversity in developing countries, particularly as they concern conservation of migratory birds within the Western Hemisphere. The Convention does not require payment of annual dues or other financial obligation so the cost of accession would be minimal, and the United States would have a major voice in any future expansion of Convention programs or obligations.

40(P) *The State Department should continue to utilize the process of accession to the Convention for the Protection of the Marine Environment of the Wider Caribbean Region and should analyze and explore the feasibility of a draft protocol on special protected areas and wildlife which particularly addresses the needs of the small islands of the region, where biological diversity is highly endemic and threatened.*

41(P) *Technical assistance from the Department of Interior under Section 8 of the Endangered Species Act should be examined.* No support for Section 8, "Technical Assistance Overseas," now exists, and allowance for overseas programs, including travel of Interior personnel to developing countries to assist in the management of wildlife and plant resources, is highly desirable.

42(P) *The USDA, AID and other appropriate agencies should examine options for broader use of PL-480 generated funds in support of programs concerning biological diversity, including establishment of protected areas.* Should Congressional constraints exist to the use of this program for such purposes, this subject should be pursued with appropriate committees of the Congress.

43(P) *The U.S. Customs Service should include wildlife imports among its priorities and should issue directives to the ports about wildlife trade restrictions. The Service should also encourage agents to investigate illegal shipments and should cooperate closely with the Departments of Justice and Interior. Justice, Customs, and Fish and Wildlife Services should emphasize fulfillment of their cooperative efforts to facilitate exchange of information and enforcement of laws on protected species.*

44(P) *The Department of Justice should undertake responsibility for compiling, clarifying and interpreting foreign wildlife laws. These clarifications and interpretations should be made available to all Federal law enforcement agencies by, for example, incorporating data into the LEMIS computer used by Fish and Wildlife Service and U.S. Customs Service.*

45(P) *The Congress should examine the Lacey Act to extend enforcement of foreign laws to include those governing trade in wild plant species. The Congress should support the U.S. Fish and Wildlife Service as required for the express purpose of enforcing CITES and the Lacey Act.*

46. *AID's environmental assessment program should continue to help in determining land use capability and best use of specific lands, and should begin during the earliest stages of project design. This program should assist LDC's in understanding long term losses that might result from short term gains and all tradeoffs, and should apply to major development projects such as river basin development, as well as smaller projects with significant effects. Efforts to improve agricultural production should be preceded by assessments that consider ecological and human components of the natural environment. This pre-planning should first be directed toward making best use of existing systems and in improving them rather than by merely promoting developed country agricultural techniques. It is imperative that a thorough analysis of environmental impacts be done early in the project planning process. Missions should incorporate requisite time and costs into project design budgets, using Mission Environmental Officers or calling upon personnel from other agencies.*

47. *In those development projects in which rehabilitation is the primary goal, greater attention should be given to natural ecosystem restoration using native species rather than exotic species and systems. This will require greater involvement of USDA, NSF, Interior, NAS and others for international and national studies leading to an improved understanding of natural systems.*

48. *The USG should continue cooperative efforts with LDC's to develop and manage programs through zoos or other appropriate institutions that are aimed at protecting endangered and threatened wildlife*

*species for subsequent rehabilitation* into compatible habitats. This will involve assistance for captive breeding techniques, education and coordination with efforts to reclaim threatened habitats.

49. *AID should establish a core resource staff, either within the agency or through cooperative arrangements with the Departments of Interior and Commerce, U.S. university and NGO communities, that can provide its Missions with direct planning assistance on biological diversity.* This core staff should be responsive to Regional Bureaus and U.S. Missions to assist AID mission staff in policy dialogue and in the identification and establishment of protected areas.

50. *The USG should work in cooperation with LDCs to discourage illegal collections and trade of endangered and threatened species.* The Department of State should continue verification for foreign wildlife laws and the U.S. Government should disseminate to all traders, trade associations and customs officials appropriate information on these laws, along with lists and pictorial descriptions of species protected within each country. Public notice should be given in the Federal Register of changes in these laws and of significant foreign wildlife trade prohibitions. The United States should seize wildlife shipments from any country that has banned wildlife exports and for which the ban is verified by the State Department, unless the responsible authority of that country gives prior notice that it intends to issue a special export permit. The United States should also continue to detain and refuse clearance of wildlife shipments of suspect origin and documentation.

51. *World Wildlife Fund-U.S. and TRAFFIC should continue to collect, organize, publish, and make available to Department of Justice and the FWS foreign wildlife trade laws.* They should also continue to monitor and publicize statistics on wildlife trade as an aid to discovering and documenting problem areas.

## **Longer Term**

52. *The USG and appropriate international conservation organizations should continue to assist developing countries prepare national and regional plans, environmental profiles and or conservation strategies.* This assistance will enable countries to determine for themselves what is to be done to achieve sustainable development and to help development assistance agencies incorporate specific assistance programs for natural resources conservation in their annual plans.

53. *Natural resource agencies in LDCs should be encouraged and supported in the strengthening and maintenance of existing protected areas, such as forest reserves, wildlife refuges, national parks, biosphere reserves, and marine sanctuaries, as well as establishing additional protected areas that represent a complete range of biogeographic provinces worldwide.* The Bali Action Plan of 1982 provides a framework

for determining ways and means for protected areas to contribute to development by helping to maintain genetic diversity. The Bali Action plan should be supported by actions that can be taken by existing USG agencies and those needing cooperation of other governments. The Departments of Commerce and Interior, AID, and USDA should incorporate specific recommendations from the Bali Action Plan into their own implementation plans.

54. *The U.S. should provide leadership in development of an effective coastal and marine biogeographical classification system, designation of marine protected areas and development of innovative, effective multiple-use management systems for wetland and coastal regions.* The Departments of Interior and Commerce should be strengthened specifically for this responsibility.

55. *Increased support should be considered for the U.S. MAB Program.* The Program's emphasis is on interdisciplinary human related ecological science, thus considering biological diversity and regional economic development. In particular, support might be directed toward the potential role of Biosphere Reserves as centers for developing the information and skills needed for sustainable conservation of regional ecosystems, and for the continuing assessment and improvement of resource management through research.

56. *The USG should provide assistance to LDC's developing processes for assessing threatened and endangered plant species, and working toward a national system of protected areas.* As USAID Missions in Tunisia, India, Jamaica, and elsewhere have noted, there is need for adequate training and institutional strengthening for management agencies, for encouraging local political and legislative support, and for supporting effective planning for land-use classification and management. Recent efforts such as those in Kenya through technical and policy-level workshops on Endangered Plant Resources For Development should be encouraged and supported there and in other LDC's. These efforts should be focused to support and assist LDC's in: Inventories and Mapping of Plant Communities; Research and Ecological Monitoring of Dynamic Ecosystems; Education and Training; Information Management; Integrated Land Use Policy and Planning; Environmental Impact Assessment; and Establishment of Conservation Priorities.

57. *The U.S. Customs Service should appoint coordinators for Wildlife Law Enforcement at major ports of entry* to investigate illegal imports of questionable origin and refer to the FWS. Non-government consultants could be used on an as-needed basis.

58. *Over the long term, the Fish and Wildlife Service should develop an increased capability in forensic science.* As wildlife smugglers become increasingly sophisticated, the Service must be able to adequately identify parts and products of protected species. More effort should be

and the fisheries research and a laboratory for this purpose should be established.

*60(P) The U.S. should provide technical assistance to LDC's to assess the status of their marine environment, to establish sustainable levels of fishery harvest, and to recommend protective measures (including assistance in developing legislation) for affected species. This effort would include stock assessment and management techniques. International efforts that develop management information, such as the "Ocean Science in Relation to Living Resources Project", should be encouraged. Particularly relevant is the expertise of FWS, NOAA, and the USFS.*

## F. HUMAN POPULATION PRESSURES

**Issue:** The need to preserve biological diversity is a crucial dimension of the struggle for equitable economic development. The goal to sustain and improve the quality of life for growing populations that in many instances are poverty stricken need not be contrary to the goal to preserve biological diversity. Preservation is both a matter of investment and insurance. The presence of sustainable, highly productive agricultural, forestry, and fisheries systems helps maintain diversity by reducing pressures for opening of new areas to development. Unless there is an understanding of the commonality between development and resource conservation, biological diversity cannot be effectively maintained.

In most of the world's developing countries, increasing human population pressures on natural resources are perhaps the primary hindrance to effective conservation. As rapidly increasing numbers of people strive to obtain sufficient food for themselves and their livestock as well as adequate supplies of energy, they are forced further into ecologically sensitive areas. Once they are converted into areas of intensive food and fuel production, habitats and ecosystems essential to maintaining biological diversity are destroyed, species disappear, and genetic resources are irrevocably depleted. Human population growth will continue and in the absence of effective family planning programs and broadly-based economic development, the depletion of natural resources and biological diversity will continue to be difficult to abate. Efforts to strengthen policy dialogue, institutions, and training focused on natural resources conservation will in the long run be greatly diluted without effective family planning.

### **Recommendation:**

*60(P) The U.S. should help leaders and opinion makers of developing countries understand the potential impact of rapid population growth on national development goals. The U.S. can assist them to*

identify obstacles to lowering population growth rates and to develop measures to ameliorate these difficulties. AID and host country project planners should ensure that social, cultural, and population dynamics factors are considered in all projects.

61. *The U.S. should continue its commitment to provide technical and material assistance to family planning programs in developing countries.* This assistance must continue to focus primarily on the provision of voluntary family planning services, through both public and private efforts. Complementary efforts must be continued to improve the health and nutritional status of women and children so that morbidity and mortality rates fall. Training for family planners, midwives and traditional birth attendants should be extended. AID and private voluntary organizations should be encouraged and supported to expand their family planning programs.

## G. ORGANIZATIONAL COORDINATION AND NGO SUPPORT

**Issue:** Consistency among the USG, PVOs, NGOs, and international organizations in the formulation and implementation of development strategies has a major influence on leadership in developing countries. Therefore a coordinated approach to project selection, design and implementation from a perspective of environmental sustainability is needed.

The capability of nations to effectively manage their own biological resources is strengthened when governmental and nongovernmental institutions as well as international organizations focus their limited financial and technical resources. Effective coordination of development projects, utilization of environmental expertise in the country being assisted, a sharing of experiences, and the development of closer working relationships all contribute to this strengthening.

Nongovernmental organizations are often the most effective mechanism in LDCs for improving the management of biological resources at the local level, either directly through project implementation or indirectly through education and increased public awareness. Where nongovernmental organizations exist that are effective at local levels, the U.S. and host countries should move to strengthen and expand upon that effectiveness.

### Recommendations:

62(P) *The U.S. should enhance capabilities and build on established mechanisms among donors to:*

- provide a forum among development assistance agencies and bilateral and multilateral donors (banks) for more effective communication and cooperation among participants in developing policies, programs, and projects for the conservation of biological diversity.

- identify opportunities for pooling human and financial resources from conservation, research, and development sectors.
- coordinate the use of U.S. technological capabilities to promote conservation of biological diversity and integrated development in LDCs through coordinated program planning and development among U.S. agencies that have technical expertise and programs to assist development agencies.
- plan and coordinate bilateral and multilateral support for research, demonstration and training activities, with attention to integrating conservation of diversity into rural development programs.

63(P) *The United States should expand its cooperation more fully with the existing international organizations which are concerned with the maintenance of biological diversity (e.g. IBPGR, other CGIAR centers, UNEP, FAO, IUCN). However, it should be noted that expanded U.S. cooperation needs to be carefully tied to productive commitments from international organizations. At each session of the UNEP Governing Council and the IUCN's General Assembly, the U.S. should continue to strongly encourage and support an approach to coordinate and enhance biological diversity-related programs among all nations and international organizations which meet cooperatively with UNEP and IUCN. The Department of State has taken the lead in mounting this campaign.*

64(P) *Establish legislation for a mechanism allowing USG agencies to support and fund through grants U.S. private and voluntary conservation organizations. Appropriate USG agencies should strengthen relationships and provide support contingent upon an appropriate mechanism being established to organizations such as Earthscan, the Environmental Liason Center and the African Wildlife Foundation. These organizations have as goals, communications with and assistance to grass root organizations in developing countries. They can assist in the task of generating a greater awareness for conservation and sustainable development in the LDCs.*

65. *The National Academy of Sciences should undertake an evaluation of risks and feasibilities of achieving agreements with countries on the cooperative use of protected areas by other governments or the scientific community for research or evaluation. The Department of State would undertake any negotiations that might be recommended by such feasibility studies.*

66. *The many U.S. private and voluntary organizations operating in developing countries, such as CODEL, VITA and the WWF U.S., should continue to increase and coordinate their efforts aimed at training and research in natural resource management and make every effort to exchange information between organizations.*

## **Longer Term**

67. *AID should expand support for low cost conservation projects implemented by LDC Private Voluntary Organizations, drawing on positive experiences gained through support of such organizations in Ecuador, Costa Rica, Panama and Indonesia.*

# SUMMARY RECOMMENDATIONS

## A. POLICY DIALOGUE AND NATIONAL POLICIES

### USING EXISTING RESOURCES

#### POLICY AND LEGISLATIVE EFFORT

1. USG should utilize this strategy for assistance programs  
RESPONSIBILITY: USG
2. Whenever feasible natural resource activities should be grant funded.  
RESPONSIBILITY: AID
3. Encourage effective land use by withholding support for degrading or destructive projects without adequate safeguards.  
RESPONSIBILITY: USG
4. Implement effective bilateral and multilateral agreements addressing plant and animal exploitation  
RESPONSIBILITY: State, Commerce, Interior

#### PROGRAM ACTIVITIES

5. Develop a system for identifying U.S. agency employees with appropriate natural resources skills and experience.  
RESPONSIBILITY: USG agencies
6. AID should assist LDCs to establish intergovernmental planning commissions  
RESPONSIBILITY: AID
7. Encourage LDCs to include protected species on CITES Appendix III.  
RESPONSIBILITY: State, Interior

### LONGER TERM

#### PROGRAM ACTIVITIES

## B. PUBLIC AWARENESS AND EDUCATION

### USING EXISTING RESOURCES

#### POLICY AND LEGISLATIVE EFFORT

#### PROGRAM ACTIVITIES

8. USG should support and strengthen existing conservation education programs.  
RESPONSIBILITY: USG and NGOs
9. AID should assist LDC educational institutions in developing conservation curricula.  
RESPONSIBILITY: AID, USDA, Peace Corps
10. U.S. NGOs should expand their assistance to LDCs for informal environmental awareness programs.  
RESPONSIBILITY: Appropriate NGOs

### LONGER TERM

#### PROGRAM ACTIVITIES

11. USG should assist LDCs to create new conservation education programs.  
RESPONSIBILITY: USG and NGOs
12. Expand educational capacities of NOAA's Sanctuary Program Division.  
RESPONSIBILITY: Commerce

## C. INSTITUTIONS AND TRAINING

### USING EXISTING RESOURCES

#### POLICY AND LEGISLATIVE EFFORT

#### PROGRAM ACTIVITIES

13. Natural resource management training for LDCs should be incorporated into each development project affecting natural resources.  
RESPONSIBILITY: AID

### LONGER TERM

#### PROGRAM ACTIVITIES

17. Develop & strengthen LDC institutional curricula for natural resource management.  
RESPONSIBILITY: Interior, USDA

### C. INSTITUTIONS AND TRAINING—continued

USING EXISTING RESOURCES		LONGER TERM
POLICY AND LEGISLATIVE EFFORT	PROGRAM ACTIVITIES	PROGRAM ACTIVITIES
	14. AID should train relevant mission staff in natural resource management prior to assignment. RESPONSIBILITY: AID	18. Provide core support for regional training programs and centers. RESPONSIBILITY: Interior, USDA, U.S. universities
	15. Support ongoing training for LDCs in germplasm protection. RESPONSIBILITY: AID, USDA	19. Encourage federal support to U.S. universities for training in biological diversity. RESPONSIBILITY: USG
	16. Include LDC professionals in natural resource management in USG exchange programs. RESPONSIBILITY: USIA, East-West Center	20. Create a conservation fellowship fund for LDC professionals to study natural resource management in U.S. RESPONSIBILITY: WWF, IUCN, multinational companies, U.S. universities, USG and others
		21. Expand training programs under Western Hemisphere Convention. RESPONSIBILITY: Interior

22. Strengthen LDC management institutions.  
RESPONSIBILITY: AID, Interior, Commerce and others
23. Strengthen LDC research institutions.  
RESPONSIBILITY: International donors
24. Increase support for animal & plant genetic resources institutions.  
RESPONSIBILITY: USG
25. Increase AID professional field staff trained in ecology and natural resources management.  
RESPONSIBILITY: AID
26. U.S. scientists should assist LDC scientists in training, institutional development and techniques for biological inventories  
RESPONSIBILITY: U.S. universities and appropriate USG agencies

## D. RESEARCH AND INVENTORIES

### USING EXISTING RESOURCES

#### POLICY AND LEGISLATIVE EFFORT

27. USG exercise leadership to encourage international donors and organizations to reprogram for research and testing for use of native plants.  
RESPONSIBILITY: USG, East-West Center
28. USG should ensure continued use of LANDSAT data for protected area management.  
RESPONSIBILITY: USG
29. Encourage LDC governments not to replace traditional agricultural systems where effective.  
RESPONSIBILITY: AID, BIFAD
30. Encourage U.S. pharmaceutical companies to divert significant resources to research focused on use of native plants.  
RESPONSIBILITY: USG and Congress

#### PROGRAM ACTIVITIES

31. Explore opportunities to develop sustainable commercial markets with native species.  
RESPONSIBILITY: Interior, AID, USDA and NGOs
32. Undertake cooperative evaluation of the adequacy of coverage and quality of protected areas.  
RESPONSIBILITY: IUCN, UNEP, NGOs (WWF), MAB, Commerce, Interior, USDA, Peace Corps, Smithsonian and others
33. Encourage U.S. and LDC institutions to research and apply indigenous agricultural practices.  
RESPONSIBILITY: U.S. universities and arboretaums, Peace Corps, NAS

### LONGER TERM

#### PROGRAM ACTIVITIES

31. Increased support should be provided for research on affordable energy substitutes and conservation in LDC's.  
RESPONSIBILITY: AID, Commerce, USDA and others
35. Research and monitoring programs developed for increased productivity of on protected areas.  
RESPONSIBILITY: Appropriate USG agencies
36. Increase research on requirements for maintaining protected area integrity.  
RESPONSIBILITY: NSF, USDA, Smithsonian Interior and others
37. Assist LDC's to identify distribution of priority areas and undertake biological inventories.  
RESPONSIBILITY: AID, Interior, UNEP, IUCN, IBRD, CGIAR and others

## E. RESOURCE MANAGEMENT

### USING EXISTING RESOURCES

#### POLICY AND LEGISLATIVE EFFORT

38. USG exercise leadership to influence international donor community to avoid support for projects involving exotic species and monocultures.  
RESPONSIBILITY: USG
39. USG should carry forward the process of accession to the Wetlands Convention.  
RESPONSIBILITY: USG
40. USG should incorporate regional island concerns under the Caribbean Basin Initiative.  
RESPONSIBILITY: State
41. Improve technical assistance under Section 8 of the Endangered Species Act.  
RESPONSIBILITY: Congress
42. USG should examine options for broader use of PL 480 funds to support biological diversity funds.  
RESPONSIBILITY: Congress, USDA & appropriate USG
43. U.S. Customs should include wildlife imports among its priorities.  
RESPONSIBILITY: U.S. Customs Service

#### PROGRAM ACTIVITIES

46. AID should ensure that its environment assessment program effectively focuses on the early stages of project design.  
RESPONSIBILITY: AID
47. Place greater emphasis on restoring ecosystems with native species.  
RESPONSIBILITY: USDA, NSF, Interior, NAS
48. Encourage continued efforts through zoos for programs aimed at returning endangered and threatened species to native habitat.  
RESPONSIBILITY: USG and appropriate NGOs
49. Identify and assign a cadre of natural resource experts to assist AID in policy dialogue, identification of biological diversity activities and planning for resource management programs.  
RESPONSIBILITY: Commerce, Interior, universities, NGOs and others

### LONGER TERM

#### PROGRAM ACTIVITIES

52. USG should assist LDCs to prepare national and regional plans, environment profiles, and/or conservation strategies to achieve sustainable development.  
RESPONSIBILITY: AID, USDA, Interior, Commerce and others
53. Strengthen existing protected areas in LDC and establish additional areas to create worldwide protected area network.  
RESPONSIBILITY: USG and intl'l organizations
54. Expand systems of protected areas to focus on coastal and marine classification and management system.  
RESPONSIBILITY: Commerce, Interior
55. Increased support for U.S. MAB program.  
RESPONSIBILITY: Congress and USG

## E. RESOURCE MANAGEMENT—continued

### USING EXISTING RESOURCES

#### POLICY AND LEGISLATIVE EFFORT

44. Justice should undertake responsibility for formatting and interpreting foreign wildlife laws.  
 RESPONSIBILITY: Justice, Customs, Interior
45. Examine the Lacey Act to extend enforcement of foreign trade laws to plants.  
 RESPONSIBILITY: Congress

#### PROGRAM ACTIVITIES

50. Expand USG interagency cooperation and coordination with LDCs to discourage illegal collections and trade of endangered and threatened species.  
 RESPONSIBILITY: State, Interior, Customs, Justice
51. WWF and TRAFFIC continue cooperative efforts with USG regarding foreign trade laws.  
 RESPONSIBILITY: WWF, TRAFFIC, Justice

#### LONGER TERM

#### PROGRAM ACTIVITIES

56. Assist LDCs in assessing status of and working towards national systems to protect threatened and endangered species and habitats.  
 RESPONSIBILITY: AID, Interior, Commerce, USDA, and others
57. U.S. Customs should appoint wildlife law enforcement coordinators at major ports of entry.  
 RESPONSIBILITY: U.S. Customs Service
58. Develop increased capability in forensic science within Interior.  
 RESPONSIBILITY: Interior
59. Provide technical assistance to LDCs for stock assessment of wild species.  
 RESPONSIBILITY: Interior, Commerce, USDA

## F. HUMAN POPULATION PRESSURES AND NGO SUPPORT

### USING EXISTING RESOURCES

#### POLICY AND LEGISLATIVE EFFORT

60. USG should discuss with LDC leaders the impact of rapid population growth on national development goals.  
RESPONSIBILITY: USG, NGOs

#### PROGRAM ACTIVITIES

61. USG should continue to increase its commitment and technical assistance to support voluntary family planning programs.  
RESPONSIBILITY: AID and PVOs

### LONGER TERM

#### PROGRAM ACTIVITIES

## G. ORGANIZATIONAL COORDINATION AND NGO SUPPORT

### USING EXISTING RESOURCES

#### POLICY AND LEGISLATIVE EFFORT

62. USG should promote among bilateral and multilateral donors more effective cooperation and coordination for all biological diversity conservation assistance to LDCs.  
RESPONSIBILITY: USG & appropriate donors
63. USG should expand its cooperation with existing international conservation organizations.  
RESPONSIBILITY: USG

#### PROGRAM ACTIVITIES

64. Establish legislation for a mechanism allowing USG agencies to fund private and voluntary organizations.  
RESPONSIBILITY: Congress
65. NAS should undertake evaluation of risks and feasibility of achieving agreements with LDCs regarding use of protected areas.  
RESPONSIBILITY: NAS, State
66. Expand support for U.S. private and voluntary organizations operating in LDCs.  
RESPONSIBILITY: AID and others

### LONGER TERM

#### PROGRAM ACTIVITIES

67. Expand support for LDC-NGOs and PVOs.  
RESPONSIBILITY: AID

# ACKNOWLEDGEMENTS

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Stan Krugman (USDA) and Calvin Martin (AID) were instrumental in designing the format and approach for preparing the report, and contributed throughout as reviewers, coordinators, and advisors.

Jack Vanderryn (AID) helped assure the final preparation, approval and publication of the report.

Mary Barber (NOAA) and Ray Meyer (AID) spent many hours consulting with and compiling input from various technical working groups, and subsequently in formulating the issues and recommendations. Along with Jon Goldstein (Interior), Ray and Mary also served as facilitators of the Interagency Technical Working Groups.

Molly Kux (AID) provided background materials and knowledge for and valuable advice to the Secretariat during the formation of the Interagency Task Force.

John Eriksson (AID) regularly convened meetings of AID's Advisory Group on Biological Diversity during the report's formulation and provided valuable guidance to the Secretariat throughout.

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Kathy Parker (AID) and Adrienne Allison (AID) developed comprehensive reports on the particular problems of management of the commons and balancing human population pressures, respectively.

Renee Dagseth contributed a great deal of time on a voluntary basis in consulting with and soliciting input from private sector business associations, professional societies, and interested individuals. Renee's

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To these individuals, and to the many persons who contributed to the formulation of this report from Federal agencies, congressional staffs, professional societies, universities, international organizations, nongovernment conservation groups, private industries, and as individuals, the Interagency Task Force extends its deep appreciation.

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# GLOSSARY OF ACRONYMS

AID	Agency for International Development
BIFAD	Board on International Food and Agricultural Development
BSR	Biotic Systems and Resources Division
CAST	Council for Agriculture Science and Technology
CGIAR	Consultative Group on International Agricultural Research
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COE	Corps of Engineers
DOS	Department of State
EPA	Environmental Protection Agency
FAO	Food & Agriculture Organization
FS	U.S. Forest Service
FWS	U.S. Fish & Wildlife Service
FY	Fiscal Year
IBAGR	International Board for Animal Genetic Resources
IBPGR	International Board on Plant Genetic Resources
INT	International Programs Division (NSF)
ITF	Interagency Task Force
IUCN	International Union for the Conservation of Nature and Natural Resources
LDC	Less Developed Countries
MAB	U.S. Man & the Biosphere Program
MBD	Multilateral Donor Banks
NAS	National Academy of Sciences
NGO	Non-Governmental Organization
NIH	National Institute of Health
NMFS	National Marine Fisheries Service
NMNH	National Museum of Natural History
NOAA	National Oceanic & Atmospheric Administration
NPGR	National Plant Germplasm Service
NPS	U.S. National Park Service
NSF	National Science Foundation
OCE	Ocean Sciences Division (NSF)
OECD	Organization for Economic Cooperation & Development
OICD	Office of International Cooperation and Development
PL	Public Law
PVO	Private Voluntary Organization
SCS	Soil Conservation Service
SDC	Science in Developing Countries Program

STRI	Smithsonian Tropical Research Institute
TRAFFIC	Trade Records Analysis of Flora and Fauna in Commerce
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific & Cultural Organization
USDA	Department of Agriculture
USG	United States Government
USGS	United States Geological Survey
USIA	United States Information Agency
WWF	World Wildlife Fund
WRI	World Resources Institute