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Protecting Biological Diversity in Jamaica
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Summary

The Caribbean island nation of Jamaica possesses a rich biological heritage. Its terrestrial forests and wetlands, its reefs and marine sea grass harbor a broad array of plant and animal species, some found nowhere else in the world. Today, urban and industrial development spearhead a legion of threats to these habitats at the very time Jamaicans are looking to their natural environmental assets as new sources of economic growth. Jamaica is, however, still crafting a national strategy for the conservation and management of its biological resources for sustainable economic growth.

This Highlight, the sixth in a series of country case studies, summarizes the results of the first phase of USAID's Protected Areas Resources Conservation (PARC) project in its effort to arrest and reverse degradation of Jamaica's natural forest and marine habitats. The Jamaica evaluation joins those of Costa Rica, Madagascar, Nepal, Sri Lanka, and Thailand in contributing to the global assessment of USAID support for biodiversity conservation. Evaluations are conducted by USAID's Center for Development Information and Evaluation.

PARC helped the Jamaican Government create a national park system, set up two pilot parks, and establish an environmental endowment fund. PARC also engaged a national environmental nongovernmental organization in operating the new national parks to extend government reach and increase local involvement in the conservation of biological resources.

The evaluators found that USAID support has led to the rapid formation of Jamaica's first national system of parks and protected areas and to the creation of the first terrestrial and marine parks. It revealed, however, that encroachment and pollution from outside the parks continue to degrade natural habitats and threaten biological sustainability. Involvement of local communities in conservation activities and nature-based tourism enterprises has helped slow encroachment into Jamaica's first terrestrial park. But creation of the country's marine park has not been able to reverse threats to further coral reef degradation from land-based pollution.

Background

For a small island, Jamaica possesses a range of terrestrial and marine habitats that give the country both ecological and economic significance. Its 7,000-foot-high mountain peaks rank among the highest in the Caribbean basin. Along with coastal piedmont zones, they serve as homes for hundreds of endemic birds, insects, and plants. The Jamaican iguana, once believed to be extinct, was recently rediscovered on the island. The giant swallowtail butterfly, second largest butterfly in the world, is found only in the island's legendary Blue Mountains, site of the first terrestrial park. (The largest butterfly, the Queen Alexandra, is found in Papua New Guinea.)

The past 30 years have witnessed profound transformations in Jamaica's landscape, changes that place much of its biological diversity at risk. Terrestrial wildlife and their habitats have given way to urban growth and expanding, logging, mining, and agricultural ventures. Near-shore marine life has been severely strained by soil runoff and agricultural chemicals resulting from these activities. Increasingly, expansion of urban and tourism centers along Jamaica's coasts continues to degrade marine ecosystems with overfishing and growing concentrations of solid and liquid wastes. Cumulative debt and a range of social needs in education, housing, and health deny the Jamaican Government financial resources sufficient to address major environmental problems.

Logging, mining, and agriculture continue to deplete forest cover. At present 70 percent of original forest cover has been lost. Decreases continue at the rate of 1 to 3 percent a year. More than 30 species of rare plants and several species of vertebrates and invertebrates, some endemic to Jamaica, are threatened.

Coastal marine habitats have fared no better. Once a magnet for international scientific inquiry, coral reefs within a single human generation have lost their dominant place to sponges and algae. Marine fishes and shellfish have been overexploited for an increasing human population and for commercial markets.

USAID's Assistance Approach

USAID was among the first foreign donors to help Jamaica address the environmental effects of its economic development. An environmental agenda for the country stemmed from a 1987 USAID-financed Country Environmental Profile. It revealed that institutions and regulations some predating independence in 1962 were inadequate from a conservation standpoint. In response to the study's findings, USAID worked with the Jamaican Government to design and implement a 3-year \$1.95 million Protected Areas Resources Conservation (PARC) project aimed at:

Providing the legal, institutional, and financial foundations for a national parks system

Demarcating and operating two pilot parks one marine and one terrestrial

USAID is implementing PARC in part through a grant agreement with a U.S. environmental organization, the Nature Conservancy. The organization raised matching funds for park start-up, staff training, and ecological monitoring. It also brought to Jamaica skills in data collection and management and in environmental education and communications. The balance of PARC funding covered participation by the government's planning office and the University of the West Indies.

In PARC's first phase, the Agency initially directed its efforts at securing passage of a Natural Resources Conservation Act. Once passed, the act integrated management of Jamaica's forest and marine resources within a single new Natural Resources Conservation Authority. The act also empowered the government to involve local groups and communities in the stewardship of those resources.

Next, the PARC project helped establish the country's first two national parks: Montego Bay Marine Park and Blue and John Crow Mountains National Park. PARC sought to build government capacity to operate the parks and to involve local groups in park operations.

To finance a share of parks system operating costs, PARC has set up an environmental trust fund to be administered by a local nongovernmental organization (NGO). And to help meet the information needs of the system and tap into the country's scientific community, PARC supported creation of a Conservation Data Center at the University of the West Indies in Kingston. In 1993 USAID began a second phase of PARC as one of four components of a new 4-year \$17.5 million project, Development of Environmental Management Organizations (DEMO). This project aims at further building capacity of government agencies and Jamaican environmental NGOs. In this phase, the Agency continues to provide interim funding for operation of the national parks system pending possible creation of a National Parks Institute. This NGO could serve as a partner to the Natural Resources Conservation Authority for day-to-day operations of the protected-areas system.

Findings

Following are the key findings of the Jamaica evaluation. They concern implementation, impact, effectiveness, sustainability, and replicability of the PARC project.

Program Implementation

Using a national parks system approach, USAID has helped the Jamaican Government define a new way of conserving the country's biological resources. Under the PARC project the Agency has worked with the government to create the country's first system of national parks and to integrate that system under the Natural

Resources Conservation Authority. Still pending, though, is approval of a national plan for the organizational development and operating procedures of the protected-areas system on the principles pioneered with PARC's assistance. The new Natural Resources Conservation Act introduces to biodiversity conservation a degree of flexibility in park management and operations. For example, it allows and even invites control and operation of specific national parks, where appropriate, by local groups and NGOs.

In addition, the act provides a means for coordinating activities and reconciling jurisdictional issues (such as forestry, tourism, mining, agriculture, fishery, hunting, waste disposal) within protected areas. Previously, responsible public agencies operated independently of one another. PARC encouraged coordination by devising ad hoc interagency committees for each of the parks. Still needed is a permanent administrative home for the national parks system. At the time of the evaluation it was confined to a project management unit within the Planning Ministry.

PARC provided initial resources to demarcate, equip, and operate Jamaica's first two national parks. Local acceptance of and support for the parks is high, but a shortage of funds for recurrent and capital costs of park operations limits effectiveness of ranger and administrative staff to provide supervision and educational services to visitors and to monitor park wildlife. Montego Bay Marine Park, Jamaica's first national marine park, is located directly offshore from the city of Montego Bay. Its beaches and near-shore coral reefs are probably the most frequented tourist destinations in the country.

PARC funded (1) establishment of a park headquarters, (2) installation of marker buoys to designate park boundaries and mooring buoys to reduce anchor damage to coral from dive and fishing boats, and (3) promotion of the park through billboard advertising (contributed by local businesses), tour-guide training courses for local fishermen, and support to a local advisory committee on which fishermen, resort and dive shop operators, and other concerned Montegonians are represented. The evaluation found that headquarters offices and staff dormitories are inadequate for the needs of the park. The no-fishing zones within the park are adequately marked, but boundary buoys have not remained in place. As a result, the park's outer boundary is not clearly delineated. Some buoys were designed for freshwater use, and their hardware quickly failed from electrolysis and corrosion. On the positive side, Montego Bay citizens have formed local committees to promote the park. Park rangers, administrative and volunteer staff, and scientists have been active in outreach programs.

Blue and John Crow Mountains National Park, Jamaica's first national terrestrial park, is located within a 1-hour drive into the mountains overlooking the capital, Kingston. Formerly designated as a forest reserve, the park holds native and secondary forest and some lands still being logged or farmed by landowners or squatters.

PARC provided funds to (1) conduct a rapid ecological assessment of the park's biological resources and develop a plan for their management, (2) establish new park boundaries, (3) hire a superintendent and staff, and (4) prepare a staff training program and provide equipment (two four-wheel drive vehicles, trail motorcycles, and two-way radios for ranger communications). Rangers began operating the park in 1992, with six rangers organized into three patrol zones. In addition, a public trail system has been established. It is relatively well marked but heavily weathered and eroded in spots.

The evaluation found good infrastructure and facilities and highly motivated park staff. There was less evidence of the financial and administrative capacity to sustain, let alone further develop, needed staff and facilities.

PARC helped capitalize an endowment fund, the revenues from which are managed by a national environmental NGO. Under a debt-for-nature swap, USAID provided \$200,000 of PARC funds, and the Puerto Rico Conservation Trust contributed \$100,000, for the Nature Conservancy to buy \$438,000 in Jamaican debt owed U.S. and Canadian banks. The conservancy arranged transfer of the debt to the Jamaican Conservation Development Trust, which used the money to set up a National Parks Trust Fund.

By fostering such partnerships with and between NGOs, PARC helped institutionalize a financial mechanism for attracting additional capital assets for conservation efforts in Jamaica. Since establishment of the trust fund, the Jamaican Conservation Development Trust has obtained donations and capital subscriptions from environmental foundations, foreign governments, and Jamaican firms. Accordingly, fund assets had swelled to nearly \$1.2 million at the time of evaluation. But the fund has yet to build an asset base sufficient to generate enough income to meet park operating costs and other expenses. As a result, rangers have gone without salary increases and basic equipment.

Originally, USAID envisioned earnings from the debt-for-nature-swap endowment being used to finance a range of local NGO environmental initiatives. In practice, one national NGO, the Jamaica Conservation and Development Trust, has used most endowment earnings to pay operating expenses (salaries, maintenance, repairs, logistics) of the two pilot parks. At the time of evaluation, the trust, with support from the second phase of PARC, had begun a fund-raising campaign. Its goal is to capitalize the trust-fund endowment to a level where it can generate revenues sufficient to replace USAID support when funding terminates.

PARC funded creation and initial operations of a Conservation Data Center to inventory Jamaica's biological resources, monitor ecological conditions, and manage information. Through the data center the Agency provided technical assistance to the two parks in the form of scientific information and resource mapping and monitoring. PARC arranged for location of the data center at the

University of the West Indies. The school makes space available for offices within the Department of Botany but provides no financial support to cover staff salaries or operating costs of the center.

The center's structure and methods are modeled directly from the Nature Conservancy's U.S. conservation data centers, located in all 50 states. Jamaica's Conservation Data Center was active in the early stages of PARC and accomplished several initial objectives. Since 1993, staffing has fallen by half and can provide only limited support to the national parks. Although the center has provided service to private interests, income from this sector has been small. At the time of evaluation the center still relied almost exclusively on USAID to fund its operations. The center faces challenges in generating effective demand for its services and mobilizing funding from sources other than USAID to cover operating costs.

Through PARC and the more recent DEMO project, USAID has fostered involvement of local and national NGOs in environmental cleanup and management initiatives that contribute to conserving Jamaica's biological diversity. Under the Natural Resources Conservation Act, NGOs are offered a leading role in executing enforcement of provisions relating to local environmental conditions. Local groups throughout the country are uniting to form a network of environmental protection associations that expand outreach capacity for the government in just about every region of the country. The Jamaica Conservation and Development Trust is the only organization so far to have been involved in placing and managing protected-area field staff. This experience is guiding other NGO initiatives in forging government NGO partnerships.

Environmental and conservation NGOs in other regions with proposed park sites are gearing up to assume management roles. Although these local park management initiatives are still quite experimental, some groups have already developed operating plans and arranged outside funding. They provide a good indication that the pilot Natural Resources Conservation Authority/NGO model, with local modifications, is spreading. PARC played a key role in improving the legal, regulatory, and institutional framework within which local environmental NGOs are flourishing. Subsequent USAID-funded activity is capitalizing on PARC's earlier ground-breaking efforts, yet progress is still hampered by uncertainty over how devolution will take place.

PARC has promoted local advisory committees as vehicles for introducing local participation in pilot park planning and management, but engagement of advisory committees in park operations has been uneven. For each of the pilot parks, PARC helped create and engage local advisory committees to establish links between Kingston-based staff; concerned governmental, private, and voluntary organizations; and neighboring local communities whose members would be affected by new regulations and practices. The idea was to make park management aware of and responsive to community needs and concerns. The committees also

were to serve as a means of communicating with and educating local communities about relevant conservation issues. This being the case, the committees were composed of a wide and sometimes conflicting range of stakeholders.

Some committee members interviewed for the evaluation indicated their group's advisory role had little effect on Kingston-based park management decisions. Others, particularly fishermen, expressed disenchantment with committee participation and tended to view the body as elitist. At the time of evaluation the experience was mixed, and three of the four committees had suspended regular meetings. Park managers recognize that the committees function best when they have a unifying issue around which to concentrate efforts. They are preparing reactivation plans accordingly.

PARC has introduced "rapid ecological assessment" techniques to identify threatened areas needing priority attention. Under guidance of Nature Conservancy staff, Jamaican scientists and local communities inventoried biological resources in each of the parks. They used rapid ecological assessment techniques designed to produce information quickly for decisionmakers. But with the exception of a fish-monitoring project conducted for the past year within Montego Bay Marine Park, neither park has prepared scientific monitoring plans for approval and implementation. Methods for systematically measuring ocean-floor communities a task specifically identified under the PARC project have been well established since the late 1970s. They were not, however, implemented after the park was surveyed and demarcated. To date, only pilot study plots have been established to test a quadrat photographic method, and proofs are currently being evaluated. Resources for sustained and systematic monitoring have yet to be found.

Program Impact

PARC's pilot efforts at Montego Bay and Blue and John Crow have raised awareness among the surrounding population that conservation of biodiversity has cultural and economic importance (as in greater employment and income by providing visitor services). PARC funded a Montego Bay Marine Park community outreach officer and an approximately \$60,000 budget to carry out activities in conservation awareness. These activities seek to educate local people about marine ecology, make them concerned about the threats to marine life, and motivate them to adopt environmentally friendly practices with regard to waste disposal, recreational activities, and removal of endangered sea life. The evaluation team observed rangers imparting conservation messages as part of their daily routine. In the first years of project implementation, the marine park involved the local press in running a regular column and providing frequent news coverage. In Blue and John Crow Mountains National Park, awareness activities were not organized under a formal program until late in PARC's first phase. Outreach and education, however, were and are an important dimension of park management. With the supplementary conservation funding, staff of the Jamaican

Conservation Development Trust have conducted an education campaign to build awareness of and advocacy for wildlife preservation.

It has apparently been effective. Surveys indicate awareness has increased. Before the campaign, nearly 30 percent had not heard of the park; after the campaign, the number was below 5 percent. The surveys also show greater understanding of the park's benefits for example, an increase to 27 percent from 11 percent among those expressing soil and water conservation as a reason the park is important to people.

Habitat degradation continues to be a problem within the new national park areas. Especially within Montego Bay Marine Park, most communities appear stressed. Evidence of this stress includes:

Low diversity and small size of fishes associated with coral reefs and near-shore communities

Low diversity of larger reef sponges and low percentage of coral coverage on the reefs, the coral being replaced by a higher percent coverage of macro algae

Poor water quality, with chronic sedimentation and nutrient enrichment

If reef degradation is to be reversed, coastal-zone management of land- and water-based practices must be improved. The replacement of corals by algae bears directly on the volume of calcium carbonate generated as sand, the source for beach formation and replenishment. Continuing loss of reef-building corals will likely result in beach erosion. Interviews with local residents confirmed that this process was already under way.

In the Blue and John Crow Mountains National Park, illegal tree cutting appears to have slowed since park designation. However, encroachment into the park for logging, mining, and farming has not been adequately contained within buffer zones.

The presence of invasive, fast-growing exotic plants, such as wild coffee, and of opportunistic feral animals also poses a significant threat to conservation of biodiversity. Wild coffee has been documented as an invasive problem in the Blue Mountains, outcompeting native plants for space within forests. As of now, the parks system is employing no eradication program.

Jamaicans, particularly those engaged in recreational tourism, have been quick to capitalize on the pilot parks. The parks are now featured in tourism literature distributed in Jamaica and the United States. They are also included in excursions offered to guests by resorts and hotels. Jamaican residents flock to the mountains and beaches of the parks during weekends and holidays. Several owners of land contiguous to the parks have begun to build lodging facilities for anticipated increases in visitors. Others to benefit are local groups that have formed enterprises

offering trail guide services and trail and facilities maintenance.

More nature tourism investors are operating crafts, food, and lodging facilities around the protected areas. More employees of nature tourism operations and local community members are working as guides or as assistants for food and lodging services. Still, the evaluation estimates that Jamaica's share of the tourism dollar is small, ranging between 10 and 20 percent about \$250 from a typical 1-week \$2,000 tour package. This is due in part to limited linkages between the tourism industry and the rest of the economy. The dissociation means that some conveniences food, drink, and the like are imported even though they could be supplied as easily by the local economy.

Spear, trap, and net fishermen have been those most adversely affected, in the short run, from creation of Montego Bay National Park. Restoration of their livelihood from fishing depends on the park's effectiveness at halting further pollution and regulating coastal land development that continues to destroy fish breeding and feeding areas. It also hinges on introducing sound fisheries management.

Program Effectiveness

The evaluation looked at how effective PARC was at changing (1) conduct of recreational service providers and users; (2) encroachment into the parks for illegal hunting or fishing, logging or shell collecting; and (3) liquid- and solid-waste pollution from industry, agriculture, urban growth, and recreational facilities.

Boundary demarcation and ranger patrolling have had a mixed effect on the behavior of tourism firms and visitors to the parks. Awareness of park ecosystems is greater among visitors, but cultural factors have affected how well this has translated into more responsible actions. The evaluation team was struck by the enthusiasm among representatives of the tourist industry for developing ecotourism operations based on the parks as attractions. For example, two local companies had sprung up since park demarcation to offer trail maintenance and trail guide services. Equally promising, informal and formal associations of resort operators, dive shop operators, and trail guide enterprises were emerging to promote their involvement in park management decisions. There is, nevertheless, a lack of information on park regulations and a shortage of ranger staff to enforce proper behavior. Consequently, some park visitors continue to abuse park resources and to put themselves at risk. Available data suggest mixed but overall effectiveness of park demarcation and protection measures in reducing encroachment by farmers, loggers, and fishermen. In the Blue Mountains the evaluation team observed rangers' awareness of new encroachments and determination to take corrective action. Rangers rely on combining cumbersome formal enforcement (which requires time-consuming procedures to apprehend and prosecute offenders) with softer conservation messages, peer pressure, and overt

scrutiny.

In Montego Bay Marine Park, fishermen have become aware of park boundaries and their enforcement. Park rangers have issued citations enforcing no-fishing zones, and equipment has been confiscated after arrests or citations. Fishermen continue to encroach, however, shifting from day to night spearfishing. At night, when fish are at rest and are easily stunned by dive lights, yields can increase tenfold.

Park creation and demarcation have had only a limited effect on reducing practices of polluters outside the parks. Arguably, the greatest problem in Montego Bay comes not from sea-based fishermen but from poor land-use practices; urban, agricultural, and industrial effluent; and failure to enforce or comply with environmental regulations. As the largest tourism center in Jamaica, Montego Bay is lined with hotels and related services. The human population of the area places a heavy burden on its infrastructure. Problems such as liquid- and solid-waste management have mounted over the past 30 years. Park management does not address such issues. Education and outreach throughout Montego Bay appear the most effective strategy for slowing and ultimately reversing degradation of the park's resources.

In Blue and John Crow Mountains National Park, habitat damage from the occasional spread of wildfires, from field burning, and from chemicals used on nearby coffee crops appears to be the biggest problem. Agricultural activity increases when prices for bananas and coffee rise and when adjacent roads to transport farm products are upgraded. In the Blue Mountains, an increase in market demand for coffee in recent years has boosted acreage converted to coffee production, and farmers have encroached into park boundaries. Park management has been only partially successful in discouraging this expansion.

Program Sustainability and Replicability

Management structures put in place under PARC are not yet institutionalized within the Jamaican Government and the NGO community. PARC can be credited for getting a national parks system on the books legislatively and creating the legal framework for setting aside national terrestrial and marine areas for the protection of their biological diversity. The evaluation found cause for concern, however, in the lack of an institutional "home" for the two parks and in the limited budget and staff of the parks and protected-areas division of the Natural Resources Conservation Authority. The government must establish a more explicit framework for the NGO participation it solicits. Moreover, the parks continue to operate without clear guidelines on coordination among the different public agencies that retain some jurisdiction over operations within or near them. As presently demarcated and managed, neither of the parks provides for long-term viability of its biological resources. Efforts are under way to expand and consolidate the mountain park with more land acquisition and provision of biological corridors, but invasion of exotic species and continued encroachment into

parklands threaten the viability of some plant and animal populations. More generally, expansion and consolidation of the land-based national parks system are limited by tenure issues and lack of funding to purchase title to private lands. Around the marine park, pollution and disruptive land use adversely affect near-shore marine communities.

The pilot parks offer useful lessons in helping Jamaica move up the biodiversity learning curve. Each has a unique set of problems and challenges around which skill and experience at parks and protected-areas management can be built. Some of this experience will be useful when decisions are reached to incorporate other protected areas into the national parks system. At the same time, the uniqueness of Jamaica's first national parks (for example, their proximity to urban centers and popularity as visitor attractions) limits replicability of the PARC approach elsewhere in the country.

Lessons Learned

Protected-areas programs work best when they have clear goals or visions (such as education, tourism, and habitat restoration) to build and sustain support for conservation of biological diversity. Jamaica's early success with the formation of a national parks system resulted from having a clear goal: demarcating and operating two pilot park habitats for endangered wildlife. Vision and leadership are needed for the parks to sustain interest and support. That vision could be one of restoring degraded forest and coral reef habitats through aggressive measures aimed at pollution control and at generating increased visitor fees for protection, operation, and restoration of the parks. Such vision can serve as rallying cries for both domestic and international supporters to foster "friends of the parks" alliances.

USAID must include measures to ensure long-term financial sustainability where it supports biodiversity programs that call for creation and management of park systems. The pilot nature of PARC's first two parks points up the fact that the project's first phase was long enough only to set up and test a system. USAID investments in creating environmental trusts, promoting local ecotourism enterprises, and fostering local NGO government partnerships in protected-areas operation and management are promising approaches to achieving long-run sustainability. Measures to address external threats from pollution must accompany demarcation and operation of parks for sustainable conservation of terrestrial and marine ecosystems. Demarcation and management of Montego Bay Marine Park demonstrates that national park creation alone is not enough to ensure conservation of the wildlife and the habitats they are designed to protect. USAID must also address land-based problems, such as coastal land development, that destroy near-shore habitats and degrade fragile marine ecosystems. To do so requires going outside the parks system to engage other sectors urban, industrial, commercial, mining, agricultural whose activities affect the conservation process.

This Evaluation Highlight was prepared by Phillip E. Church of USAID's Center for Development Information and Evaluation. It summarizes findings of the forthcoming Program and Operations Assessment Report No. 11, *Stemming the Loss of Biodiversity: An Assessment of USAID Support for Protected-Area Management (PN-ABS-518)*. Reports may be ordered from the DISC, 1611 North Kent Street, Suite 200, Arlington VA 22209-2111; telephone (703) 351-4006; fax (703) 351-4039; Internet docorder@disc.mhs.compuserve.com.