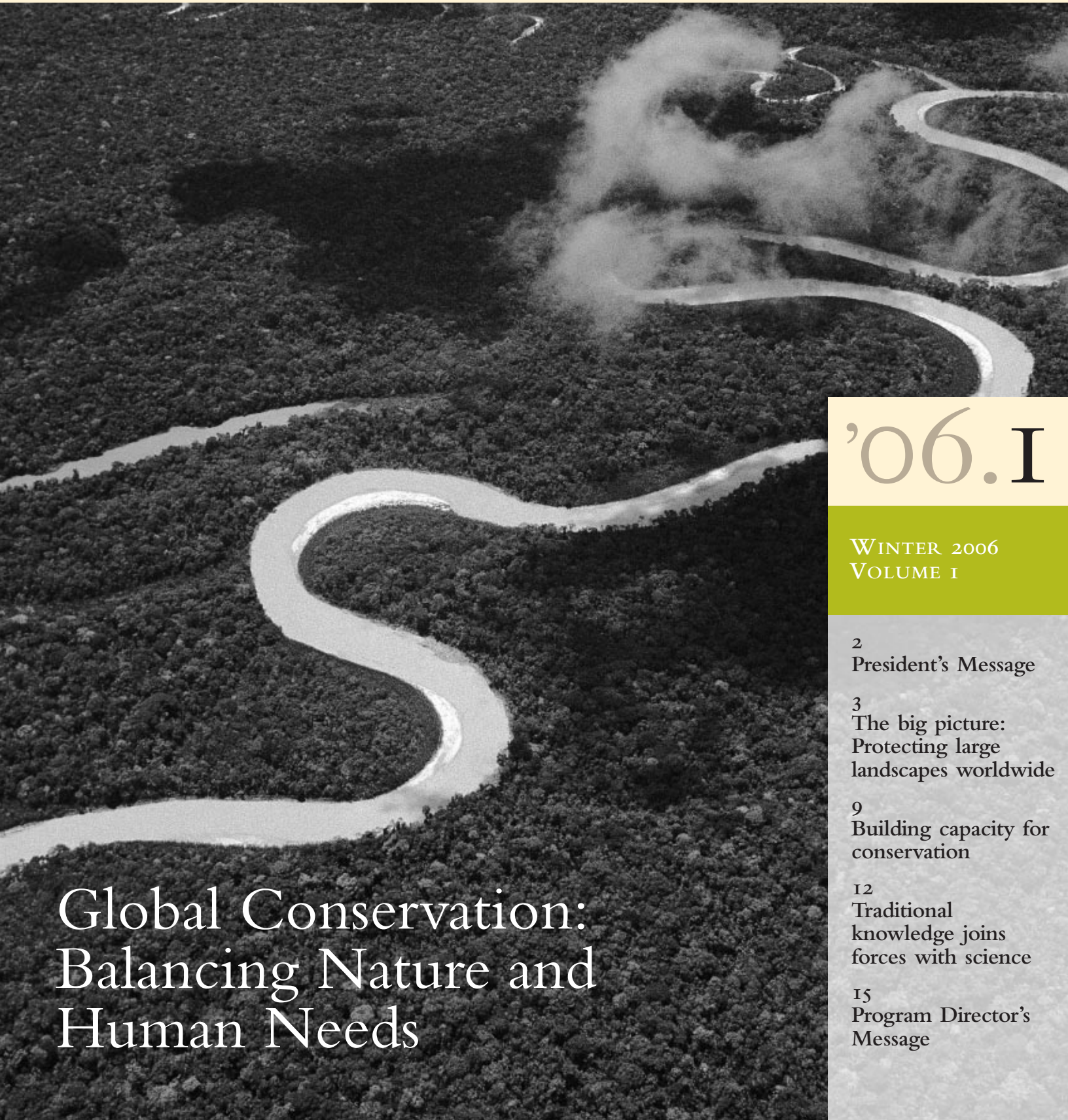


MACARTHUR

A newsletter from The John D. and Catherine T. MacArthur Foundation



Global Conservation: Balancing Nature and Human Needs

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Balancing nature and human needs

There is no mistaking the border of Volcanoes National Park in Rwanda. From the intensely cultivated land, I stepped from brilliant sunshine into the deep, cool shade of a mountain forest and began the steep and slippery climb. My goal was to spend an hour in the presence of a family of mountain gorillas, the most endangered of the world's great apes. Fewer than 700 mountain gorillas survive, and half of them live in the Virunga Massif, a high altitude forest ecosystem that straddles the borders of Rwanda, the Democratic Republic of Congo, and Uganda. Remarkable as it is to spend time with these gentle giants, perhaps more remarkable is that they survive here at all, with their forest habitat surrounded by a volatile region that for more than a decade has been torn by war and genocide.

The conservation of biological diversity—the species, ecosystems, and ecological processes that make up the web of life—is the goal of MacArthur's Conservation and Sustainable Development Program. Conservation is often thought to be a scientific endeavor, and the Foundation has supported projects to increase scientific knowledge and capacity for more than two decades. But the conservation of the mountain gorillas and the many other species within their forest habitat depends as much on politics, economics, demographics, and culture as it does on biology and scientific knowledge. The Foundation's approach to grantmaking is grounded in an understanding of the human forces that shape the environment. It is an approach that requires supporting not just scientists, but entrepreneurs, senior government policymakers, farmers, park managers, and community organizers.

For example, consider the human pressure in the Albertine Rift, which covers only one percent of the landmass of Africa but contains almost 15 percent of the continent's plant species, half of its birds, and 40 percent of its mammals, including 27 species of primates. The protected areas that harbor this diversity are situated within the most populated part of Africa, with a density of more than 600 people per square kilometer in some places. Rural farmers here often earn less than a dollar a day. The Foundation seeks to support projects that balance the needs of nature and human communities. In

Rwanda this is possible because the gorillas' forested mountain home also protects what are called "ecosystem services," including the water source for the park's neighbors and the stability of the soils on the steep slopes. Tourists who visit the gorillas have become a major source of foreign revenue for the national government, but they are just beginning to provide an income source for communities. As this example indicates, protecting the rich and vital biodiversity of this region faces many challenges that will not be quickly resolved. This is one reason why the Foundation has focused on just a few areas around the world where it can support the development of local expertise and make a long-term commitment.

The Albertine Rift is one of nine biologically rich ecosystems, sometimes called "hotspots," or centers of biodiversity, where the Foundation is now making grants. Each of these focal areas has its unique assemblage of wild plants and animals, and its own social, political, and economic challenges. In 1986, MacArthur was the first major private foundation to adopt biodiversity conservation as a major area of grantmaking, and to date we have invested more than \$350 million in conservation efforts. The Foundation supports conservation work in the Albertine Rift (see map, page 6) and in eight other global priority areas. Together these focal areas encompass a broad swath of the world's biodiversity and a wide range of cultures and social and economic conditions.

The Foundation's work-plans for every region set two fundamental goals. First, we want to preserve large landscapes and seascapes in order to maintain their biological diversity (see "Seeing the big picture," page 3), even in the face of direct threats, such as deforestation, and emerging indirect threats, such as climate change—an area that the Foundation is beginning to explore. Second, we want to build the capacity of local institutions in these focal areas, because the future of these landscapes ultimately rests in local hands (see "Defending their own," page 9). In addition, the Foundation seeks to address emerging or unresolved issues that are affecting progress in our focal areas, such as conservation planning and implementation in the face of climate change or in multi-faceted social contexts (see "Director's Message," page 15). MacArthur's investments are further enhanced through the Critical

Ecosystem Partnership Fund (CEPF), a joint initiative of the MacArthur Foundation, the World Bank, the Global Environment Facility, the Government of Japan, and Conservation International, which aims to advance global biodiversity conservation by providing support to nongovernmental, community, and grassroots organizations.

But why do species, ecosystems, and ecological processes matter? Species are the fundamental building blocks of the earth's ecosystems that provide pure water, renewed soils, food, energy, and clean air. Diverse and healthy ecosystems increase resilience in the face of inevitable change and are necessary for human survival and well-being. In addition to these practical considerations, there are also aesthetic and ethical reasons why we should preserve the ability of future generations to improve and enrich their lives. Most urgently, however, virtually every area of the tropics where the Foundation works faces a deteriorating natural environment, the result of unsustainable patterns of production and consumption, often driven by forces thousands of miles away and conflicts over access to resources. If ecosystems are too severely disturbed, their ability to meet human needs is undermined, the plight of those living on the land suffers, and recovery becomes difficult.

To stem the loss of biological diversity, one must look in detail at specific places. This newsletter illustrates a few examples of how MacArthur's support for conservation and sustainable development is making a difference. We recognize that change in this area is slow and difficult to measure, but we are committed—through our support for research, training, and practical interventions—to staying the course.

Jonathan F. Fanton
President

Seeing the big picture: Conservation of large landscapes worldwide



Above: Mist hangs over the Tambopata National Reserve, one of a chain of protected areas along the border between Peru and Bolivia.

Right: Field Museum and CIMA staff overlook a steep escarpment in the rugged mountains of Peru's Cordillera Azul, which was designated a national park in 2000.

Cover: Manu river, a tributary of the Madre de Dios river that runs through Peru.

Flying in a helicopter over Peru's isolated Cordillera Azul, Debra Moskovits was awestruck by the region's size—larger than the state of Connecticut—and beauty. The Field Museum biologist has seen some of the world's most spectacular places, but almost no one had ever



seen this: a series of wildly diverse, uninterrupted, and interconnected mountain and lowland ecosystems ranging from 200 to 2,400 meters (650 to 7,900 feet) in elevation.

(continued on next page)



“You fly over the Amazonian lowlands, and you suddenly reach a mile-high wall of peaks that looks like the Tetons,” she says. “In one area of red rock hills, you think you’re on another planet. There’s an isolated lake, major waterfalls, and gently rising hills that drop abruptly. And it all goes on and on and on, as far as the eye can see.”

With more than 13,500 square kilometers (5,200 square miles) and few human inhabitants, the Cordillera Azul was a rare example of a huge unprotected area that had not yet been degraded—although threats loomed from every side. Moskovits, director of the environmental and conservation program at the Field Museum in Chicago, was in Peru to collaborate with Peruvian scientists on a rapid biological inventory (RBI),

funded by the MacArthur Foundation. The scientists’ goal: to use the RBI to make the case to the Peruvian government that the region was a natural and international treasure deserving of special park status—and to protect it before it sustained irreversible damage. In fact, much of the forest was already slated for logging, so timing was critical.

The jewel of the Andes

Dropping from helicopters, the 18-person scientific team was soon on the ground, setting up tents and fanning out across the region looking for birds, plants, frogs, mammals, reptiles, and anything else they could find. Over the course of three weeks, they worked around the clock to explore habitats ranging from towering mountains to marshlands and elfin forests,



The upper Amazon river in northeastern Peru.

Below: In places such as the Albertine Rift region—where these women farmers pose—quality of life depends on the quality of the

environment. To conserve large landscapes, local communities must play a central role in resource management and conservation.

which occur in high altitudes where winds and low temperatures cause trees to be miniaturized. They catalogued 1,600 plants (they estimate that there are actually 6,000 plant species in the region), 71 mammals—including spider monkeys and jaguars—500 birds, and 82 amphibians and reptiles. Among their discoveries were 30 species previously unknown to science, including a black squirrel, a poison arrow frog, and tiny fish with suction-cup type mouths and powerful ventral muscles that enable them to climb rocks and move upstream in rapid headwaters.

The report was persuasive, especially after Peru's interim president Valentín Paniagua went up in a helicopter to see for himself. Just three months after the report was published, in May 2001, Paniagua—in one of his last official acts in office—signed a decree declaring the area *Parque Nacional Cordillera Azul*.

“The whole process happened very quickly by conservation standards,” says Lucia Ruiz, who advocated for the park and is now the executive director of Centro de Conservación, Investigación, y Manejo de Areas Naturales (CIMA), a nongovernmental organization founded to support the management of high-priority protected areas such as the Cordillera Azul. “Many of CIMA's founders had been working on this issue for years. Just when we felt that time was running out, we had a great historic opportunity to protect the area.”

Preserving the integrity of large areas—so important to sustaining entire biological communities and the natural processes they need to thrive—is a major goal of the Foundation's conservation grantmaking. MacArthur supports the creation of protected areas in key regions around the world and funds staff training, scientific research, park management, and initiatives that engage local communities to enhance life and build support for the parks.

In Peru, grants enabled an effective partnership: a committed group of Peruvian conservationists with political access and local support joined forces with the Field Museum to gather the scientific evidence necessary to convince the national government to protect a unique part of Peru's natural heritage.



Courtesy of Susan Haviland

Grants to CIMA also funded the park management planning process and helped create its protection system. One of the organization's major strategies has been to involve nearby indigenous communities directly in park surveillance and protection and to create conservation-friendly livelihood options. On the eastern side of the mountains, more than 40 illegal logging operations have been closed down by six teams of unarmed park guards, largely using the information and negotiation skills provided in CIMA's training programs.

“In native communities, quality of life depends directly on quality of the environment,” says Moskovits. “After years of abuse of the land by coca cultivators and guerilla activity, the people are desperate to reverse this trend. So they are very pro-conservation.”

Albertine Rift in Central Africa

Central Africa's Albertine Rift region is best known as home to the world's 700 remaining mountain gorillas, which live in the forests of Rwanda, Uganda, and the Democratic Republic of Congo. It is one of the world's most biologically diverse regions as well as one of its most ecologically important. But it is also one of the most densely populated rural regions in the world, with some areas supporting up to 600 people per square kilometer. Increasing use of land for agriculture; harvesting of wood for fuel and construction; poaching; and other human activities all threaten the biodiversity of the region.

Furthermore, the region has been at the crossroads of civil unrest and armed conflict for more than a decade, with



Central Africa's Albertine Rift region is best known as home to the world's 700 remaining mountain gorillas.



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untold human casualties and displacement (including conservation staff), devastation of wildlife, and loss of the integrity of protected areas. Refugees were settled on the edge of parks, where they had to depend on forest resources for survival, which led to further degradation of natural resources within the parks. During that time, 20 gorillas died, and there were fears that the species could disappear forever. Today, although fighting in the region has

subsided, there is still intense pressure on the park system and on efforts to preserve the region's biodiversity.

Conservationists in the Albertine Rift, like those in all of the world's densely populated and biologically rich regions, must consider the human element of conservation in their work. "Although gorillas and their habitat are our priority, we also look beyond them and target the needs of the people in the region," says Eugene Rutagarama, head of the International Gorilla Conservation Program (IGCP), a coalition of the African Wildlife Foundation, Fauna and Flora International, and the World Wildlife Fund. MacArthur's priorities for promoting landscape conservation in the region include support to enhance management of conservation areas, strengthen community conservation in areas surrounding the parks, and promote regional collaboration in conservation.

With support from the Foundation, IGCP works in partnership with government agencies to protect the habitat of the remaining gorillas. IGCP activities include efforts to reduce poverty by working with community-based organizations on business ventures such as community tourism, handicrafts, beekeeping, and other income-enhancing activities linked to conservation. Promoting transnational

collaboration is especially important, since a number of the habitats in the Albertine Rift cross national boundaries and therefore are often subject to opposing management and land-use practices. Mountain gorillas—which are important to the Democratic Republic of Congo, Rwanda, and Uganda because of the potential tourism revenue they generate—have provided common ground and a strong incentive for collaboration among these countries.

"Natural resources are at the base of much of the conflict in the world," says Annette Lanjouw, international technical advisor and former director of the IGCP. "But conservation can also be a tool for building peace, a bridge among different parties who must learn to work together. In our case, we had to develop a program for conserving the mountain gorilla habitat that includes conflict resolution, and this has played a huge role in our success."

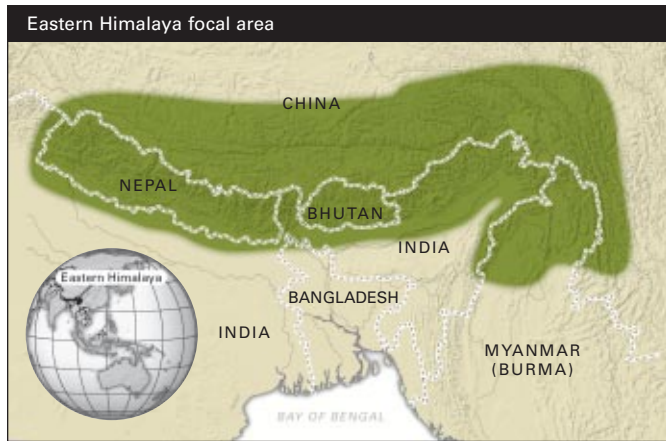
As Central Africa works to renew itself post-conflict, there are encouraging signs that efforts to conserve the Albertine Rift's biodiversity are taking root. In the past ten years, the mountain gorilla population has increased by nearly 12 percent, as park agencies and local groups work together to patrol the parks and eliminate poaching. Rwanda recently established the Nyungwe Forest, one of the most
(continued on page 8)



Left: In many parts of the Albertine Rift, the differences in land use patterns for agriculture and biodiversity conservation are stark.

Communities that live in and around the Volcanoes National Park in Rwanda often plant crops to the park border.

Below: Bhutan's traditional Buddhist society is supportive of conservation. The people have great respect for nature and animals.



Conserving seascapes in Madagascar

Linking land and sea

Madagascar, the world's fourth largest island, includes natural ecosystems that comprise both land and sea. One of the country's last remaining large intact natural ecosystems is the Antongil Bay region, which includes the largest bay in the country and the most extensive stretch of uninterrupted rainforest. The bay itself is a significant breeding, calving, and nursing ground for the humpback whale and home to an impressive collection of reef and deep sea fishes, dolphins, and the endangered sawfish and dugong ("sea cow"). The rainforest includes an estimated 50 percent of Madagascar's biodiversity. Rare species such as red ruffed lemurs, serpent eagles, and red owls live in the place where the forest touches the reef.

Oceans are by far the largest of the earth's ecosystems, yet the traditional focus of conservation has been on terrestrial landscapes. In recent years, protecting marine life and seascapes has taken on new urgency as many countries

become increasingly deforested and growing numbers of people turn to the ocean for food and income. The Antingol Bay is one of a number of marine areas in Madagascar, Melanesia, and the Caribbean where MacArthur is providing support for conservation purposes.

Although Madagascar is surrounded by water, most Malagasy people have historically depended on the land and agriculture for survival, says Herilala Randriamahazo, marine and coastal program director in Madagascar for the Wildlife Conservation Society. "Fifty years ago, families could grow vanilla, cloves, or rice, and it was enough for their needs," Randriamahazo says. "Now there is not enough productive land, and we have seen a drastic increase in the number of people who make their living fishing." Approximately 120,000 people, most of whom engage in subsistence farming and fishing, live in the forests around Antongil Bay, and the population continues to grow.

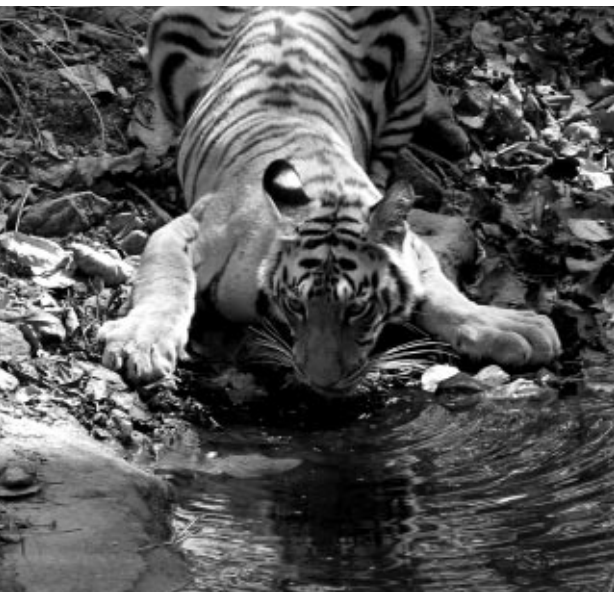
A key habitat for local and regional finfish and shellfish production, the bay has become a thriving center for small-scale fisheries, artisanal shark fisheries, and industrial shrimp trawling—all of which could threaten to deplete the biological resources of the marine system. In addition, overexploitation of neighboring forests has led to poorly controlled run-off and has increased sedimentation in the bay.

To slow further degradation in the region, the Wildlife Conservation Society collaborates with the Malagasy government to help local populations recognize the ecological and economic links between land and marine ecosystems and to implement natural resource management programs in forests and coastal areas. The society also works to improve dialogue among artisanal and commercial fisheries in order to promote sustainable fishing practices and marine conservation. It has long been active in humpback whale and marine

mammal conservation in Madagascar, as well as in helping the Malagasy Parks Service manage and protect the Masoala National Park. Now, with Foundation support, the society is designing and implementing an integrated strategy for conservation and sustainable natural resource use in the Antongil region.

"Madagascar is so rich with biodiversity—every little piece of remaining natural forest is full of life," says Helen Crowley, director of the society's Madagascar program. "It's been a huge challenge to choose priority areas because so much needs attention. After more than a decade of work in the forest, we are now getting a handle on the marine side and are developing an integrated program of land and sea. Working on such a large scale can be daunting, but when we get it right we will have really achieved something. Unlike a small area, a large protected area has a great deal of natural toughness and resilience that will ensure survival." ■

Below: Highly visible species such as tigers bring important attention to conservation. Tigers require large landscapes for survival.



Credit: Neel Gogate/WWF India

biologically important mountain forests in Central Africa, as a national park. And in a gesture that demonstrates strong political commitment to conservation and trans-boundary collaboration, government officials from the Democratic Republic of Congo, Uganda, and Rwanda signed an agreement in October 2005 to conserve and manage nine parks in the central part of the Albertine Rift region as a collective ecosystem.

“We must target the future of human beings in the region and encourage collaboration across national boundaries if we want to conserve the biodiversity of the region,” said Rutagarama.

Kingdom of Bhutan

This small landlocked country, home to some of the Himalaya’s highest peaks, is a conservation success story. Flanked by some of the world’s most populous countries, it has relatively low population density (only 700,000 people in a country roughly the size of Switzerland), an enlightened government that promotes conservation as a priority, and strong religious and cultural traditions that encourage the protection of nature. More than 60 percent of Bhutan’s land remains under natural vegetation cover. The government has set aside more than a third of its national territory as protected areas. This land includes a series of

national parks, wildlife sanctuaries, and strict nature reserves that are connected by biological corridors into a single continuous landscape.

Despite its conservation successes, the kingdom faces threats caused by expanding agriculture, cattle overgrazing, and unmanaged collection of firewood and timber. While poaching is not a serious problem in Bhutan due to religious sensitivity to killing animals, local communities are generally unaware of the broader implications of conservation.

The MacArthur Foundation has supported conservation and sustainable development in Bhutan since 1991. In recent years, Foundation grants have focused on establishing the eastern area of Sakten—so remote it is a two-day hike from the nearest road—as a wildlife sanctuary. Sakten’s flora and fauna include mountain yaks and snow leopards as well as dozens of kinds of brilliantly colored rhododendron. The area also is home to an ethnically and culturally distinct group of people called the Brokpa.

Other MacArthur grants have supported the development of a scientifically based management system for the kingdom’s corridor system. “Historically, there had been only what I call ‘Indiana Jones research’—individual studies of rhinos or leopards,” says Pralad Yanzon, founder of Resources Himalaya, a non-governmental organization in the region that promotes science and capacity building as the tools needed for conservation management. “Until recently there had been no concerted effort to use good science as a basis for long-term planning and decision-making. You can’t have

good long-term conservation without good science.”

The development of biological data and mapping is the first step, Yanzon says, and one that never ends. “Information gathering is a dynamic process, because the landscape changes constantly, the climate changes, and the way people use the land changes. After you collect the truth and facts about the landscape, then you can launch the development activities that guarantee the environment won’t be harmed.”

Most recently, the Foundation has supported efforts to multiply the number of trained conservation professionals, forest guards, and village-level forest stewards needed to manage Bhutan’s enormous system of protected areas. In 2004, the new Minister of Agriculture, Lyonpo Sangay Ngedup (now prime minister), indicated that upgrading training and training facilities for forest staff professional development was his highest priority. By 2007, with Foundation support, the new Ugyen Wangchuck Institute of Forestry and Environmental Studies will welcome its first classes of conservationists and managers. The curriculum is being developed in collaboration with the Yale School of Forestry, the U.S. Forest Service, the Asian Institute of Technology, and the Forestry School of the University of Montana.

“We envision that the forestry school will not only contribute to the conservation of our country’s rich biodiversity,” says Lyonpo Sangay, “but that it will also serve as a great resource for conservation efforts across the Himalaya region.” ■

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For more information on large landscapes

The following is a select list of organizations receiving support from MacArthur to help to conserve large landscapes in the nine regions that are the focus of the Foundation’s biodiversity conservation grantmaking:

African Wildlife Foundation
www.awf.org

Fauna & Flora International
www.fauna-flora.org

Uganda Wildlife Authority
www.uwa.or.ug

Wildlife Conservation Society
www.armscontrolcenter.org

Instituto Bien Comun
www.biencomun-peru.org

Instituto Alexander v.Humboldt
www.humboldt.org.co

Centro Desarrollo Indígena Amazonico
www.cedia.org.pe

Corporacion Grupo Randi Randi
www.randirandi.org

Community Forestry International
www.communityforestryinternational.org

International Centre for Integrated Mountain Development
www.icimod.org

The Mountain Institute
www.mountain.org

The Nature Conservancy
www.nature.org

World Wildlife Fund
www.wwf.org

Defending their own: Strengthening local organizations and institutions



It takes generations of people, both at the grassroots level and in established institutions, to ensure that ecological resources are conserved, studied, and managed. For this reason, the Foundation makes a variety of grants to build the capacity of organizations and countries. In Ecuador, for example, a grant has helped indigenous people protect their traditional homeland. In Madagascar, grants to universities support the training of field professionals needed to establish priorities on an island facing severe conservation threats. In Vietnam, where civil society organizations are virtually non-existent, the Foundation has made grants directly to a government department.

Ecuador: An indigenous people guards its heritage

The ancestral territory of the Cofan people spreads across the Andean foothills and tropical lowlands of northeastern Ecuador and Colombia. Cloud-covered rainforests, mountain savannahs, and vast marshes teem with hundreds of bird species and large mammals, including spectacled bears, jaguars, and rare giant otters. The Cofan, one of the oldest surviving cultures in the Americas, have struggled to preserve their language and way of life during more than 500 years of contact with non-indigenous cultures. The past four decades have

presented the Cofan with the biggest challenges to their solidarity, as they have fought to protect their ancestral lands from the incursion of oil companies, loggers, and miners, and to defend their status as rightful landowners. In addition, the production and trafficking in coca have increased the risk of drug-related violence in the region.

“Oil exploitation hit us particularly hard,” says Randy Borman, the son of U.S. missionaries, who grew up among the Cofan, is embraced by the community, and serves as a forceful advocate for their resource rights. “Traditionally, we didn’t even have concepts for things like territory and overall land usage. We finally woke up and realized we had to look at the forest with new eyes, understand its fragility and finiteness, and make a conscious decision to defend it—not just because it’s valuable to us, but because it has a very real value to the whole world.”

To formalize and give greater credibility to their conservation and advocacy efforts in Ecuador, the Cofan created the Cofan Survival Foundation (Fundación para la Sobrevivencia del Pueblo Cofan). Through persistent negotiations with the Ecuadorian Ministry of the Environment, the foundation ultimately gained legal ownership and management rights to about one million acres within the vast lands that once

Above: The Cofan people of Ecuador and Colombia have legal ownership and management rights to much of their ancestral territory. Here an Ecuadorian Cofan park guard patrols on a river in the Cofan Bermejo Ecological Reserve.



Below: Building on the practical expertise and knowledge of local resource users, such as these fishermen in Madagascar,

is an important ingredient for effective conservation of large landscapes over the long term.



constituted the Cofan's ancestral homeland—an unprecedented agreement between the national government and an indigenous people.

But enforcing the Cofan lands' integrity remained a problem. The Ecuadorian Ministry of the Environment lacked resources to patrol the land, and illegal hunting, logging, and agricultural activities continued. Once again, the Cofan had to take matters into their own hands.

With a grant from the MacArthur Foundation, the Cofan Survival Foundation has created and trained its own park guard corps. The guards' mandate encompasses not only enforcement, but also biological monitoring, mapping, surveying, and trail building.

The current cadre of 70 Cofan park guards includes men and women ranging from age 14 to 70, all with a deep understanding of the Cofan land and the traditions that over centuries have worked to safeguard their territories. Training builds on this knowledge and ranges from learning basic first aid skills to using Global Positioning Systems to defusing potentially dangerous confrontations with intruders (like their Ecuadorian national park guard counterparts, the Cofan guards do not carry arms). In the past few years, Cofan park guards have developed hundreds of kilometers of trails, constructed ranger stations at strategic points within their territory, and defended their land against illicit logging, coca growing, and petroleum workers intent on illegal exploration.

Staff from the Field Museum of Chicago, Ecuador's national parks, and other conservation-oriented organizations provided initial training for the guards, although today the program is largely the responsibility of the Cofan themselves. In fact, the Cofan's expertise is now such that

they operate a training center in Quito that also trains government staff working in other protected areas, such as the Choco-Manabi reserve on the western side of the Andes. "As we get better at the mechanics of keeping our section of the forest intact, spreading knowledge is a central priority," Borman says.

Madagascar: Developing conservation management expertise

A large and biologically diverse island off the coast of East Africa, Madagascar is thought to have separated from the continent more than 160 million years ago. As a result of this long period of physical isolation, the island developed a spectacular array of species found nowhere else in the world. In fact, 98 percent of the country's mammals and 80 percent of its flowering plants are unique to Madagascar. It is the lemurs, however, that are the country's flagship species, with more than 30 varieties that are endemic to the island. Madagascar's unique biodiversity has come under severe threat in the past couple of decades. According to recent estimates, it has lost nearly 80 percent of its rainforests to logging and agricultural encroachment, driven by the lack of productive farming practices and demands for charcoal, fuelwood, and timber.

In 2003, in an effort to slow the rapid destruction of the remaining forest, the government of Madagascar announced it would triple the size of its protected landscapes by adding some 4.5 million hectares (11 million acres) of forest, wetland, and marine areas to its preserves. This expansion created a pressing need for many more conservation professionals, including a significant increase in the number of field conservation managers required to staff parks across the island.

"As we get better at the mechanics of keeping our section of the forest intact, spreading knowledge is a central priority," Borman says.



Below: Villagers in Vietnam learn about planting trees and forest management. Training and hands-on demonstrations in the

field enables local communities to play a more active role in conservation.



“The problem in the field is not simply one of biology,” says Daniel Rakotonirainy, professor of animal biology at the University of Antananarivo. “It has to do with sociology and economics. The greatest threat comes from impoverished people who cut down the forest and cultivate what they need to survive. Illegal logging is the next greatest threat. Companies agree in government contracts to replant, but often fail to do so.” These complex challenges require conservation professionals trained not only in science, he says, but also in law, management, economics, and sociology.

The MacArthur Foundation has

responded by supporting a new master of science degree program in conservation biology at the University of Antananarivo. The one-year, multi-disciplinary course is designed to produce a new generation of field managers in Madagascar. Conservation agencies, both government and private, rely on universities as the major source of higher education for their staff. Similarly, the scientific community in universities is critical for developing new knowledge and creating networks that strengthen and guide conservation activities. Funding for the new program at the University of Antananarivo is part of the Foundation’s

broader strategy to support university training in Madagascar. Additional grants have funded the development of a marine protected area training program at the University of Toliara and the creation of training materials for other Malagasy institutions of higher education.

Vietnam: Forging new partnerships

Vietnam ranks high among countries with the largest number of threatened reptiles, birds, and mammals, including the Javan rhino, considered one of the world’s most endangered species. Its forests constitute one-third of the country and are home to langurs, wild boar, gibbons, and profuse bird life.

Historically, officials of Vietnam’s centralized government have managed protected areas with enforcement-oriented approaches that have triggered intense conflicts with local leaders and community members. Some ethnic groups, for example, have resisted top-down decisions *(continued on back page)*

For more information on capacity building

The following is a select list of organizations receiving support from MacArthur to help local authorities better manage conservation efforts in the nine regions that are the focus of MacArthur’s conservation grantmaking:

American Museum of Natural History
www.amnh.org

Association Nationale pour la Gestion des Aires Protégées
www.parcsmadagascar.com/index.htm

Makerere University
www.makerere.ac.ug

Conservation Through Public Health
www.ctph.org

National University of Rwanda
www.nur.ac.rw

University of Antananarivo
www.univ-antananarivo.mg

Wildlife Conservation Society
www.wcs.org

Sociedad Peruana Derecho Ambiental
www.spda.org.pe

Fundacion Cayetano Heredia
www.upch.edu.pe

Caribbean Natural Resource Institute
www.canari.org

Profonanpe
www.profonanpe.org.pe

Community Conservation Network
www.conservationpractice.org

Environmental Defenders’ Office
www.edo.org.au

Resources Himalaya
www.resourcehimalaya.org

South Pacific Regional Environment Programme
www.sprep.org.ws

University of the South Pacific
www.usp.ac.fj

Grandfather's wisdom: Revealing the science behind traditional knowledge

As a boy growing up in the 1980s in the small community of Daku in the Fiji Islands, Alifereti Tawake was aware that his coastal village's fish catch was not as abundant as it had once been. The days of his grandfather setting a pot of water to boil before he went fishing for dinner were past. Commercial night fishing, begun in the mid-80s, would nearly eliminate the humphead wrasse, a large local fish. Over time, some villagers turned to canned fish rather than trying to bring home a fresh catch for dinner.

The Fijian people's connection to the ocean is both practical and spiritual. Eighty percent of the population lives along the coast and depends on fish for dietary protein and income. Fijians have an ancient system of collective management and tenure over their traditional fishing

grounds. Each coastal clan identifies itself with a totem fish, and village rituals observe the sacred connection of people to the fishing grounds.

Tawake was fifteen years old when one such ritual occurred after the chief of his village died. The passing of a chief is marked by a moratorium (tabu) on fishing for 100 days in an area of the fishing grounds designated as a no-take zone or refugia. The tabu practice (which is the genesis of the word taboo in English) is a key management concept for traditional Fijian resource management. Setting aside a tabu area allows the fish time to replenish and grow. At the end of the mourning period, villagers enter the refugia to catch fish for a feast. The size of the catch is regarded as a measure of the deceased chief's power.

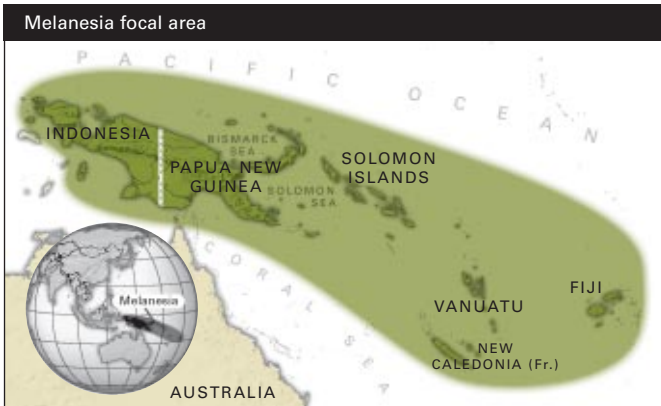
"I can still remember that day," says Tawake. "I went out in a dugout canoe with the fishermen. In an hour or two, they caught thousands and thousands of snappers. It was the first time I had seen that many fish caught, and I was amazed by the chief's power."

Today, Tawake uses traditional practices in combination with modern conservation techniques and science to protect habitats and fish populations in Fiji. He is a fellow at the University of the South Pacific and a founder of the Locally Managed Marine Area Network, a coalition that implements community-based marine management in the biologically rich South Pacific. The network trains community members in scientific methods that validate traditional practices such as temporary no-take

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Effective conservation integrates local wisdom with science. Pictured here is a community hall in a Fijian village where meetings are held that help to pass on local knowledge from one generation to the next.

Right: Clouds hang over Viti Levu, Fiji's main island.



zones and seasonal bans. It is one of a number of conservation initiatives worldwide supported by the MacArthur Foundation that integrate local wisdom with the science of conservation.

The power of the tabu

Fiji's first locally managed marine area site was in the village of Ucuivanua, where clams were once plentiful. But by the early 1990s, "it could take a whole day to harvest clams because there weren't many in the mudflats," says Ratu Pio Radikedike, a young chief of Ucuivanua.

For two years in the late 1990s, the University of the South Pacific conducted training in environmental education and scientific skills with volunteers from Ucuivanua village. As an experiment, a team of 20 local managers staked out a

no-take area in the mudflats near the village and asked the chief to hold a ceremony declaring a five-year tabu. The team sampled the clam population at 10-meter (10.9 yard) intervals, analyzing their results statistically and establishing a baseline of clam populations. Within a year, the numbers of clams in and adjacent to the refugia area were much higher and the size of clams larger. Soon villages throughout Fiji and the Pacific Region were inspired to set up their own locally managed marine areas. At the end of the three-year study in Ucuivanua, there was a 165-fold increase in clams inside the refugia and a 58-fold "reseeding" increase in the harvest sites nearby.

The return of the wrasse

In Tawake's home village of Daku, a four-

year ban on taking all fish and marine resources, including humphead wrasse, is showing results. While the fish were once so scarce that each wrasse swam alone, in the past year groups of the fish have been spotted swimming together. The variety and number of fish have grown dramatically. And the leatherback turtle, after an absence of some 15 years, has reappeared on the beaches.

In Ratu Pio's village, the five-year tabu has been extended indefinitely, because the reseeding effect provides adequate supplies of clams. The chief now works as a technical advisor to the Fiji Department of Fisheries. "I am moving around Fiji spreading the gospel of conservation," he says. "Nearly all the places I go to and share my village experiences are following in the footsteps of Ucuivanua." ■

In the village of Daku, the variety and number of fish have grown dramatically and the leatherback turtle has reappeared on beaches.



Courtesy of Mark Erdmann

Grantees in Global Conservation

The following is a list of all organizations that received funding from MacArthur through its conservation and sustainable development area in 2004 and 2005.

AFRICAN WILDLIFE FOUNDATION
www.auf.org

AMAZON CONSERVATION ASSOCIATION
www.amazonconservation.org

AMERICAN MUSEUM OF NATURAL HISTORY
www.amnh.org

ARIZONA STATE UNIVERSITY,
CENTER FOR ENVIRONMENTAL STUDIES
www.ces.asu.edu

ASSOCIATION NATIONALE POUR LA GESTION
DES AIRES PROTÉGÉS
www.parcsmadagascar.com/index.htm

BIRDLIFE INTERNATIONAL
www.birdlife.org

BOSTON COLLEGE
www.bc.edu

CALIFORNIA ACADEMY OF SCIENCES
www.calacademy.org

CARE
www.careusa.org

CARIBBEAN NATURAL RESOURCES INSTITUTE
www.canari.org

CENTER FOR ENVIRONMENTAL LAW
AND COMMUNITY RIGHTS, INC.
www.celcor.org.pg

CENTRE ECOLOGIQUE DE LIBANONA
www.libanona.com

CENTRO ECUATORIANO DE DERECHO AMBIENTAL
www.ceda.org.ec

CENTRO DE CONSERVACION, INVESTIGACION, Y
MANEJO DE AREAS NATURALES, CORDILLERA
AZUL (CIMA)
www.cima-cordilleraazul.org.pe

CENTRO PARA EL DESARROLLO DEL INDIGENA
AMAZONICO
www.cedia.org.pe

COLUMBIA UNIVERSITY IN THE CITY OF NEW
YORK CENTER FOR UNITED STATES-CHINA ARTS
EXCHANGE
www.columbia.edu/cu/china

COMMUNITY CONSERVATION NETWORK
www.conservationpractice.org

COMMUNITY FORESTRY INTERNATIONAL
www.communityforestryinternational.org

CONSERVATION THROUGH PUBLIC HEALTH
www.ctph.org

CONSULTATIVE GROUP ON BIOLOGICAL DIVERSITY
www.ccbd.org

CORNELL UNIVERSITY, CORNELL LABORATORY
OF ORNITHOLOGY
www.birds.cornell.edu

DURRELL WILDLIFE CONSERVATION TRUST
www.durrellwildlife.org

ENVIRONMENTAL DEFENDER'S OFFICES LTD.
www.edo.org.au

ENVIRONMENTAL DEFENSE FUND
www.environmentaldefense.org

ENVIRONMENTAL LAW ALLIANCE WORLDWIDE
www.elaw.org

FAUNA & FLORA INTERNATIONAL
www.fauna-flora.org

FIELD MUSEUM
www.fieldmuseum.org

FUNDACION AMIGOS DE LA NATURALEZA
www.fan-bo.org

FUNDACION CAYETANO HEREDIA
www.upch.edu.pe

FUNDACION PARA EL DESARROLLO DEL SISTEMA
NACIONAL DE AREAS PROTEGIDAS
www.fundesnap.org

FUNDACION YANGAREKO

GREENWATCH
www.greenwatch.or.ug

GROUPE D'ETUDES ET DE RECHERCHE SUR LES
PRIMATES DE MADAGASCAR

GRUPO JARAGUA

INSTITUTO DEL BIEN COMUN
www.biencomun-peru.org

INNER ASIAN CONSERVATION

INTERNATIONAL CENTRE FOR INTEGRATED
MOUNTAIN DEVELOPMENT
www.icimod.org

INTERNATIONAL INSTITUTE FOR SUSTAINABLE
DEVELOPMENT
www.iisd.org

LATIN AMERICAN STUDIES ASSOCIATION
www.lasa.international.pitt.edu

LIGA PARA LA DEFENSA DEL MEDIO AMBIENTE
www.lidema.org.bo

MAHONIA NA DARI
www.mahonia.org

MAKERERE UNIVERSITY, INSTITUTE OF
ENVIRONMENT AND NATURAL RESOURCES
www.makerere.ac.ug

MARINE AQUARIUM COUNCIL
www.aquariumcouncil.org

MBARARA UNIVERSITY OF SCIENCE AND
TECHNOLOGY
www.must.ac.ug

MOUNTAIN INSTITUTE
www.mountain.org

NATIONAL UNIVERSITY OF RWANDA,
DEPARTMENT OF BIOLOGY
www.nur.ac.rw

NATURE CONSERVANCY
www.nature.org

OFFICE RWANDAIS DU TOURISME ET DES PARCS
NATIONAUX
www.rwandatourism.com

ORGANIZATION FOR TROPICAL STUDIES
www.ots.duke.edu

PARTNERS IN COMMUNITY DEVELOPMENT FIJI
www.fsfi.org.fj

PRINCETON UNIVERSITY
www.princeton.edu

PROFONANPE
www.profonanpe.org.pe

RARE CENTER FOR TROPICAL CONSERVATION
www.rare@rarecenter.org

REEF CHECK FOUNDATION
www.reefcheck.org

RESOURCES HIMALAYA FOUNDATION
www.resourceshimilaya.org

ROYAL GOVERNMENT OF BHUTAN, MINISTRY OF
AGRICULTURE
www.moa.gov.bt

ROYAL SOCIETY FOR PROTECTION OF NATURE
www.rspn-bhutan.org

SEA WEB
www.seaweb.org

SECRETARIAT OF THE PACIFIC COMMUNITY
www.spc.int

SOCIEDAD PERUANA DE DERECHO AMBIENTAL
www.spda.org.pe

SOUTH PACIFIC REGIONAL ENVIRONMENT
PROGRAM
www.sprep.org.ws

TANY MEVA FOUNDATION

UGANDA WILDLIFE AUTHORITY
www.uwa.or.ug

UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND
CULTURAL ORGANIZATION, WORLD HERITAGE
CENTRE
www.unesco.org

UNITED NATIONS ENVIRONMENT PROGRAMME,
CARIBBEAN REGIONAL COORDINATING UNIT
www.cep.unep.org

UNIVERSIDAD NACIONAL DE LA AMAZONIA
PERUANA, ESCUELA DE POST GRADO
www.unapiquitos.edu.bo

UNIVERSITY OF ANTANANARIVO, FACULTY OF
SCIENCES
www.univ-antananarivo.mg

UNIVERSITY OF EAST ANGLIA, OVERSEAS
DEVELOPMENT GROUP
www.uea.ac.uk

UNIVERSITY OF FLORIDA, GEOGRAPHY
DEPARTMENT
www.cob.ufl.edu

UNIVERSITY OF QUEENSLAND, CENTRE
FOR MARINE STUDIES
www.marine.uq.edu.au

UNIVERSITY OF THE SOUTH PACIFIC
www.usp.ac.fj

WETLANDS INTERNATIONAL-OCEANA
www.wetlands.org

WILDLIFE CONSERVATION SOCIETY
www.wcs.org

WORLD BANK, INTERNATIONAL BANK FOR
RECONSTRUCTION AND DEVELOPMENT
www.worldbank.org

WORLD RESOURCES INSTITUTE
www.wri.org

WORLD WILDLIFE FUND
www.worldwildlife.org

WORLD FISH CENTER
www.worldfishcenter.org

Reexamining the social dimensions of conservation

The MacArthur Foundation seeks to conserve biological diversity in nine of the most biologically rich areas on earth, ranging from high mountain meadows in the Himalaya of Bhutan to the vast wetlands of Cuba's Zapata swamp to the arid spiny forest of Madagascar's southwest coast. But these lands are also home to some of the world's poorest people, many of whom struggle to survive growing subsistence crops on small plots of land in increasingly unpredictable climates.

Balancing the needs of nature and people on a finite amount of land presents difficult choices. In parts of Africa the profit from the sale of meat from a single Cape buffalo can equal a university professor's monthly salary. In Asia, wild elephants may be the source of jobs and revenue from tourism for some, but to others they are a threat to their crops and occasionally their lives. In Latin America, a national park that generates foreign exchange for the nation may place the land off limits for the local *campesinos*.

MacArthur grantees around the world work to resolve this tension, testing new ideas, discarding what doesn't work, learning and fine tuning. As this newsletter shows, they have often been successful but, not

surprisingly given the complexity of the challenges, in other cases the results have been disappointing. The Conservation and Sustainable Development Program is currently developing a research initiative on the social context of conservation to examine what lessons can be gleaned from more than 20 years of experience and experimentation. We seek to uncover insights that may lay unrecognized in academic journals and better understand how funding, organizational structure, or staff training affect the way conservation organizations address social issues. It is premature to anticipate the results of this initiative, which is still in the design phase, but some preliminary conclusions are beginning to emerge. For example, approaches that only discuss "win-win" solutions are not sufficient. While there may be opportunities to meet the dual goals of conservation and improved livelihoods, in many places conservationists and rural people face trade-offs that need to be acknowledged, debated, and resolved. Conservationists and funders may need to consider restructuring rights and responsibilities when weighing the benefits of a global public good, such as biodiversity conservation, against the near-term costs to an individual or community, which may only receive a benefit in the distant future.

As described in this newsletter, most MacArthur grants support direct actions to conserve biological diversity or to build local capacity, but the Foundation also has a long history of funding new and emerging ideas, including forest certification and the evolving field of environmental economics. Seeking a better understanding of the tensions between biodiversity conservation and human well-being is the most recent effort in the Foundation's tradition of support for new thinking and improved practice in conservation.

Michael Wright
Director, Conservation and Sustainable Development Program

About the Foundation

The MacArthur Foundation is a private, independent philanthropic institution that makes grants through four programs.

- The Program on Global Security and Sustainability supports organizations engaged in international issues, including peace and security, conservation and sustainable development, population and reproductive health, and human rights. To aid in this grantmaking, the Foundation maintains offices in India, Mexico, Nigeria, and Russia.
- The Program on Human and Community Development supports organizations working primarily on national issues, including community development, regional policy, housing, public education, juvenile justice, and mental health policy.

- The General Program supports public interest media and the production of independent documentary films.

- The MacArthur Fellows Program awards five-year, unrestricted fellowships to individuals across all ages and fields who show exceptional merit and the promise of continued creative work.

With assets of more than \$5 billion, the Foundation makes grants totaling approximately \$200 million each year.

For more information about the Foundation's conservation grantmaking, please email 4answers@macfound.org or visit www.macfound.org.

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that disregard their traditional forest use and agriculture practices. But in the mountainous and biologically rich Central Annamite region of Vietnam, a more inclusive strategy is taking shape at two recently established nature reserves.

In a grant made directly to a provincial government department, the Foundation provided support to the Thua Thien-Hue Forest Protection Department, which oversees the management of the Phong Dien Nature Reserve. The grant will build on the innovative thinking of the department's director, Hoang Ngoc Khanh. In what is considered a bold move in Vietnam, he has reached out to a wide range of ethnic groups and local organizations in several villages. He has collaborated with these stakeholders on a new "co-management" structure of administration that is intended to balance conservation of biological resources and the development needs of

the people. Because many people in the area traditionally subsist on forest resources, communities were permitted to set apart sections of land for their own purposes. In one pilot program, villagers are using part of their land allocation to grow medicinal herbs and rare native plants. In another project, two ethnic minority groups have created an eco-tourism attraction at the Adon waterfall.

"Stakeholder participation enables us to be more effective," says Khanh. "Now that communities have land allocated to them for management, they don't go into the forest for hunting and logging anymore." This new sense of ownership, he notes, seems to be resulting in fewer illegal incursions into protected lands in neighboring Laos.

"In countries where there's a strong civil society and a great number of non-government organizations, grantmakers have a lot of options," says Benjamin Hodgson, a

conservation expert based in Laos with the World Wildlife Fund. "In Vietnam, the reality is that there isn't that kind of infrastructure. The centralized government is the best place to turn for effectiveness."

The Foundation grant is also supporting replication of the co-managing approach in the neighboring Quang Tri Province. And while co-management may not be appropriate for every one of Vietnam's 90 protected areas, there is enormous potential for co-management to be widely adopted, says Ted Webb, associate professor of natural resource management at the Asian Institute of Technology. "Vietnam is moving faster than other developing nations to make policies that improve the livelihoods of rural people while contributing to resource conservation," he says. "There are a lot of independent, entrepreneurial thinkers there—people who are willing to stick their necks out." ■



Global Conservation: Balancing Nature and Human Needs

For more information about the Foundation's efforts related to global conservation, or for an electronic version of this newsletter, visit our website at www.macfound.org, or call (312) 726-8000.

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