

## Panama to undercut environmental-impact studies

Bogotá, Colombia

**W**hen Panama's National Assembly passed a bill last month allowing the president and his ministers to waive environmental-impact studies for development projects, civil society groups reacted with outrage.

Protestors faced riot police outside the National Assembly on June 12, as the vote took place. Then on June 17, thousands of the bill's opponents demonstrated in the streets of Panama City. And environmental groups vowed to take their fight to the Supreme Court, saying that by undercutting impact studies the government was violating its constitutional duty to guarantee a healthy environment.

"The government sees these studies as a time-consuming hindrance when in fact they

have an enormous bearing on fragile ecosystems and the lives of indigenous and peasant-farmer communities," says Raisa Banfield, director of Sustainable Panama, a Panama City-based environmental group.

Environmental impact studies, a cornerstone of international project management and environmental law used—at least on paper—by every country in Latin America, have been a required step for development projects in Panama since 1998.

But the pro-business government of Panamanian President Ricardo Martinelli regards them as a bureaucratic drag on its plans to transform the nation's currently small mining sector

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## Town changes heart—and appetite—to help turtles

Astillero, Nicaragua

**T**hirty years ago, the colony of olive ridley sea turtles that nested annually on Nicaragua's Astillero beach migrated four kilometers (2.5 miles) north as their old nesting site was settled by fishermen—many of whom had a taste for turtle eggs.

But thanks to educational campaigns by conservation groups and the open-mindedness of residents, this Pacific coast fishing town has had a change of heart and appetite.

With help from the conservation group Fauna and Flora International, the 850 families

of Astillero recently built a turtle hatchery using wooden beams and black nylon netting. During the turtles' annual arrival to lay their eggs—an event known as an arribada—community residents carefully collect the eggs at the nearby nature reserve at Chacocente Beach.

They bring them back to their hatchery in Astillero. This dramatically improves the odds of survival for these new additions to the

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Boy releases olive ridley hatchlings on Astillero beach (AP Photo/Esteban Felix)

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### Crackdown on miners leads to more malaria

Green advocates applauded Venezuelan President Hugo Chávez in April, when he sent troops into the southern state of Bolívar to break up illegal gold mining operations that were causing deforestation and mercury poisoning along the tributaries of the Orinoco River. (See “Chávez dispatches troops to stop illegal gold miners”—EcoAméricas, May '10.) But with hundreds of camps destroyed and more than 10,000 miners driven from their mining pits, an unintended consequence has emerged: malaria.

Health Ministry statistics published in June reveal that the cases of malaria nationwide doubled in the first six months of the year, from around 11,000 cases to around 22,000, with more than 90% of the cases in Bolívar.

Authorities attribute the outbreak to the operation that has driven illegal miners from remote outposts in the Caura River watershed—a tributary of the Orinoco. Authorities say that as the miners have moved to towns and villages, mosquitoes that bite them have spread malaria to other humans in those communities.

“We expected it,” says Ana Gineth Morales, head of Bolívar State’s Public Health Institute.

But critics assert health authorities weren’t prepared for the dislocation of the miners, who had been drawn to the area from other parts of Venezuela and from neighboring countries by soaring gold prices. Health officials weren’t in place in villages to detect the disease, hand out medi-

cines and preventively spray houses with insecticides to kill mosquitoes, the critics say.

“In previous years, some 6,000 houses were sprayed in Bolívar,” Ricardo Alcalá, a local health official, told the press in May. “But this year they haven’t even sprayed 500 houses, and that’s why we face this epidemiological disaster.”

Small-scale gold mining enables malaria transmission by creating open pits that, once mined, are allowed to fill with creek and river water. When that water becomes stagnant, it creates a fertile environment for malaria-carrying mosquitoes. Epidemics worsen when health officials are unable to dispense medicines to areas where the infected miners migrate or when miners are short on medicines and take them haphazardly, breeding drug-resistant malaria strains.

“Unfortunately, the government wasn’t prepared for the possibility that its military operation might actually spread the malaria problem to other areas,” says Antonio Machado, an expert on the Orinoco and a professor of zoology and tropical ecology at the Central University of Venezuela in Caracas. **Follow-up:** Antonio Machado, Professor of Zoology and Tropical Ecology, Central University of Venezuela, Caracas, Venezuela, +(58 212) 605-1534, [antoniomachado@ciens.ucv.ve](mailto:antoniomachado@ciens.ucv.ve).



### Environmental pick in Colombia is Bessudo

Colombian President-elect Juan Manuel Santos has named Sandra Bessudo, a French-Colombian marine biologist and shark-conservation advocate, to become his environment minister when he takes office Aug 7.

The daughter of a French ecotourism entrepreneur, Bessudo, 41, is best known for her crusade to establish the 9,500 square-kilometer (3,700-

sq-mile) Malpelo National Protected Area. Lying off the west coast of Colombia in the eastern tropical Pacific, Malpelo is the world’s ninth largest marine preserve. She also led high-profile efforts to designate the area a Unesco World Heritage Site, and, as the preserve’s director, to crack down on vessels whose crews kill sharks for their lucrative fins—a practice that is decimating shark populations.

As Colombia’s top environmental official, she will confront a variety of difficult questions beyond the marine-conservation issues she has focused on for much of her professional life. A major one concerns Colombia’s effort to induce a multi-billion-dollar oil and minerals boom, a process that has seen the establishment of many coal, gold and oil concessions on indigenous or Afro-Colombian lands and in areas of high biodiversity. Environmentalists say Bessudo will need to perform a delicate juggling act in order to ensure the resulting projects do not do serious ecological harm.

A massive expansion of rice, forestry and biofuel crops into the Colombian Orinoco, meanwhile, threatens that biologically diverse region, with its hundreds of bird and mammal species. (See “Development pressure builds along Orinoco”—EcoAméricas, April '10.)

And there will be difficult international climate-change negotiations in coming years in which Colombia will be especially keen to get its fair share of resources from the United Nations Adaptation Fund. Colombia hopes the fund, established by Kyoto Protocol signatories to help developing countries cope with climate change, will help it address water-supply problems caused by the loss of Andean glaciers and the drying out of high-altitude grasslands, or páramos.

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# Mixed reviews for Brazil's new energy plan

Rio de Janeiro, Brazil

**A**s Brazilian green advocates digest the government's latest long-term electric-power strategy, they have come to feel equal parts encouraged and queasy.

The latest 10-year Energy Expansion Plan, released in late April to cover the period 2010-2019, calls for investing R\$214 billion (US\$120 billion) in electrical energy over the next ten years to accommodate projected 5.4% annual increases in power demand during the period.

Environmental groups are glad that compared to the previous plan, released in 2008, the new blueprint provides for a smaller increase in electricity generation from fossil-fueled power plants, and a larger increase in power derived from non-hydroelectric, renewable sources. At the same time, they blanch at the plan's provisions for six new hydroelectric dams in protected areas of the eastern Amazon.

Says Ricardo Baitelo, coordinator of renewable energy issues for Greenpeace in Brazil: "Their reservoirs will have big impacts on the fauna and flora of areas that the government has set aside to protect."

## Smaller fossil-fuel share

The new plan envisions an electric-power matrix in which fossil-fueled thermal plants will supply 15.3% of Brazil's electrical energy by 2019, as opposed to 17.8% under the last blueprint, which spanned the period 2008-2017. The new version projects non-hydro renewable energy, mainly wind and biomass, will supply 8.7% of Brazil's power, as opposed to 4% in the 2008 edition. Those changes reflect the federal government's intention to meet greenhouse gas emission reduction targets for 2020 set forth in its 2009 climate-change law, officials say.

Thus far, the government has encouraged the growth of both wind and biomass power by holding auctions for energy from those sources and providing financing, tax breaks and subsidies for wind and biomass. These moves have made non-hydro renewables more competitive, says Claudio Sales, president of Acende Brasil, a private-sector energy research institute.

How competitive they'll be is still unclear, judging by the results of auctions held so far for such power. At the only biomass-power auction, held in Aug. 2008, distributors bought just 548 megawatts of capacity from 31 projects. Biomass entrepreneurs say few biomass developers took part because the maximum price established by the government was too low.

However, in the country's only wind-power auction held thus far, distributors purchased 20-year contracts calling for a total of 1,805 megawatts involving 71 projects.

"[I]t tripled the wind power that will go into Brazil's electrical energy grid when the

projects deliver the wind power they sold," says Pedro Perrelli, head of the Brazilian Wind Energy Association (Abeolica), a wind industry group. "This will result in R\$8 billion (\$4.6 billion) in new wind-energy investment."

Under the new plan, hydropower would account for 73.9% of Brazil's electricity output by the end of the 10-year period. That compares to 76% under the earlier 10-year strategy. But unlike the previous plan, the new one also calls for six new dams on the Tapajós River and one of its tributaries, the Jamaxim, in the eastern Amazon state of Pará. Collectively, those six dams would have an installed capacity of 10,907 megawatts—nearly half the generating power of the dams whose construction is slated to start in the period 2014 to 2019.

## Way smoothed for dams

The inclusion of these dams was made possible by an April 2010 presidential decree (No. 7,154) allowing studies and environmental impact assessments to be done at potential dam sites in protected areas. Another decree would have to be issued to allow actual construction of the dams in protected areas to begin.

The six dams are being called platform dams, which would require reforestation of areas around the dam, as well as of access roads, once the dams have been built. Plant employees would arrive by helicopter and work 14-day shifts as offshore oil-platform workers do, President Luiz Inácio Lula da Silva said in March.

José Goldemberg, an energy professor at the University of São Paulo and Brazil's environment minister in 1992, calls the concept "environmentally inviable." Says Goldemberg: "They won't stop mass colonization and deforestation because it takes 15-20 years for replanted trees to grow and remove the conduit created by access roads. And trees felled to string transmission lines from the dam provide smaller corridors into the Amazon."

Aviva Imhof, campaign director of International Rivers, a Berkeley, California-based environmental group, adds that the reservoirs of the six dams, one of which is the 6,133-megawatt São Luiz do Tapajós dam, are expected to flood 871 square kilometers (336 sq miles) of Amazon rainforest in protected areas. Says Imhof: "That is a considerable amount of environmental destruction in areas that the government is supposedly trying to protect."

Counting land slated for inundation both outside and within protected area, the six dams' reservoirs would flood a total of 1,979 square kilometers (764 square miles), an area half of the size of the state of Rhode Island.

—Michael Kepp

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## Documents:

2010-2019 Energy Expansion Plan (in Portuguese):  
[http://www.epe.gov.br/PDEE/20100504\\_1.pdf](http://www.epe.gov.br/PDEE/20100504_1.pdf)

2008-2017 Energy Expansion Plan (in Portuguese):  
[http://www.epe.gov.br/PDEE/20091119\\_1.pdf](http://www.epe.gov.br/PDEE/20091119_1.pdf)

## Move to expel missionary draws criticism

Lima, Peru

**E**nvironmentalists, human rights advocates and church workers are speaking out in defense of a British Catholic missionary here whom Peru's government has threatened with expulsion.

On July 2, Peruvian immigration officials informed Brother Paul McAuley, a member of the De La Salle Christian Brothers, a Catholic teaching order, that his residency had been revoked, and gave him seven days to leave the country. Authorities attribute the order to McAuley's participation in public protests, apparently referring to his involvement with an environmental group in the northeastern city of Iquitos, where he works. The group, called Loreto Environmental Network, has challenged the government's aggressive push for timber and oil and gas concessions in the region.

On July 7, a judge in Iquitos granted McAuley's habeas corpus petition, allowing him to stay in the country. The government appealed the ruling, and McAuley expects the appeal to be heard in early August.

McAuley, who arrived in Peru in 1990, spent a decade as a teacher and school principal in a low-income neighborhood in Lima before moving to Iquitos in 2000. He began working with indigenous youths who migrated to the city from their home communities to attend school. There, he founded the Loreto Environmental Network. "Our work is basically education. We try to make sure people know their rights," McAuley says. "There's a new forestry law, and we've been campaigning about that."

### Security concerns claimed

A statement from Peru's General Immigration and Naturalization Office, suggests the decision to revoke McAuley's residency dates to August 2009. Officials said then that the missionary, who has a religious visa, "is engaging in activities contrary to his immigration status and acts that jeopardize the security of the state, the public order and national defense."

Authorities took no immediate action, however, and McAuley said he renewed his residency as usual in September 2009.

The official statement indicates the scrutiny of McAuley last year came two months after protests by indigenous people in and near Bagua, in the northern Peruvian Amazon, left 34 people dead. Protestors objected to new laws that they said would make it easier for private companies to gain access to natural resources on their lands. (See "Amazon violence prompts Peruvian repeals"—EcoAméricas, June '09.)

Though indigenous people in various parts of Peru's Amazon region staged protests and roadblocks for two months before the violence in Bagua, McAuley says there were no protests

in Iquitos, which is well west of Bagua, in the Amazonian lowlands. He says that after the killings, he did take part in peaceful marches for an investigation of the Bagua events. He and other Loreto Environmental Network members have worked with indigenous and settler communities affected by timber and oil operations in northeastern Peru. "We were involved in that before [the protests in] Bagua," McAuley says. "We had nothing to do with Bagua."

At least four other foreign Catholic missionaries, including two bishops, and a number of Peruvian church workers, have been targets of official criticism or prosecution for their defense of communities affected by logging, mining, petroleum and biofuel operations, especially in the Amazon region.

When McAuley's expulsion order was announced, demonstrators in Iquitos rallied to support him as more than 400 people, including foreign missionaries and Catholic and Protestant Peruvian church workers, held a vigil at a La Salle Brothers school in Lima.

### Harder line on protests

In recent decades, foreign missionaries have participated in local protests against inadequate public services for the poor, political violence, corruption under former President Alberto Fujimori and other issues. The government has taken a harder line on demonstrations in the past few years, making highway blockades—a common protest tactic—a crime.

A TV spot broadcast in early July begins with an ominous voice saying, "Warning, warning," and the words "Peru is at war." It blames protestors for trying to keep the country from tapping its natural resources for development.

Lawyers at the Legal Defense Institute, a nonprofit human rights group in Lima, say McAuley was protected by the constitutional right to free expression, and that protests or marches calling for environmental protection are not illegal or unconstitutional.

At a press conference on July 16, Catholic Archbishop Miguel Cabrejos, head of the Peruvian Conference of Bishops, said the country's bishops and missionaries had his "full support." He called for the courts to be impartial and follow due process in McAuley's case.

Meanwhile, Yurimaguas Bishop José Luis Astigarraga cited findings by the government Ombudsman's Office that half the social conflicts in Peru involve environmental issues. Said Astigarraga: "If they don't stop dividing [the Amazon] into lots and granting the lots in concession, I am truly sorry, but it will be very difficult to avoid situations of conflict."

—Barbara Fraser

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# Entrepreneur sees bamboo boost for Haiti

Granada, Nicaragua

**A**rmed with sacks of bamboo seeds, Ben Sandzer-Bell arrived in post-earthquake Haiti earlier this year with a plan to offer an eco-friendly way to bring housing to the estimated 1.5 million left homeless by January's 7.0-magnitude temblor.

Sandzer-Bell sees a business opportunity in Haiti: low-income prefabricated bamboo houses, which are less costly to build than concrete dwellings and less likely to crush people in earthquakes and hurricanes. He believes demand for them could spur the development of bamboo plantations and, thus, reforestation of a sort in the most environmentally degraded country in the Americas. "There's a complete and instant rethink for many Haitians about how they are going to build their next house," says Sandzer-Bell, a French-American and former aerospace executive, noting that many Haitians continue to sleep in tents.

As vice president of strategy for Chicago-based AAR Corp., Sandzer-Bell led a push under which carbon credits were purchased to make AAR the first carbon-neutral company in the U.S. aerospace industry. He also helped roll out a GPS-based air-traffic system for Boeing that allows more direct routes and more planes in the same airspace, reducing overall emissions.

## Prefab housing planned

His company, CO2 Bambu, grows bamboo on Nicaragua's Mosquito Coast—ranked by the International Monetary Fund as the poorest part of Nicaragua, which is the second-poorest country in the Western Hemisphere behind Haiti. The concept for the fledgling business is to use bamboo from the plantations to build bamboo-plywood prefabricated housing for the low-income market.

Efforts to get Haitian homeless out of camps in public spaces and into temporary wooden structures strong enough to survive the hurricane season have faced a hurdle—lack of space amid the rubble. Edmond Mulet, a special United Nations envoy to Haiti, has said that the quake and its aftermath pushed many Haitians into areas vulnerable to landslides.

Unsustainable farming practices and intense pressure for firewood and charcoal have left Haiti with just 2% of its forest cover, one of the highest levels of deforestation in the world, according to a U.S. State Department report. Seventy-one percent of fuel consumed in Haiti is wood or charcoal, according to the U.S. Agency for International Development. The resulting soil erosion, meanwhile, has left much of the land unfit for farming and unstable during natural disasters.

Like many Latin American countries, Haiti had native species of bamboo; but these suf-

fered in the colonial period, says Gib Cooper, former vice president of the American Bamboo Society and CO2 Bambu's director of bamboo science. There are 19 species of bamboo native to the Caribbean and West Indies.

"European countries don't have a bamboo culture and in the Americas wiped out all signs of bamboo culture except in Ecuador and Colombia," Cooper says.

An attempt to reintroduce bamboo in Haiti in the 90s by the Organization for the Rehabilitation of the Environment, a Haitian nonprofit, fell short on account of a variety of problems, among them grazing by feral goats, inadequate care in the dry season and lack of income during the growing period, Cooper says.

There are still small-scale bamboo plantations in Haiti, mostly to produce handicrafts or furniture. Cooper says the bamboo housing push will face cultural challenges. "Bamboo has always been in the Americas but not considered something modern," Cooper says. "The status symbol house is concrete or concrete block with a wood-supported steel roof."

## Lighter alternative

Though that view is shared by Haitians, the earthquake might have changed minds, says Regine Laroche, a Haitian architect. "People are wary of concrete construction, after experiencing its potentially deadly power, and looking for lighter alternatives," Laroche says. "Bamboo construction is affordable—a major factor in an economically challenged economy."

Bamboo builders will have to find ways to improve resistance to fire, he adds, pointing out that concern about fire is one reason Haitians tend to opt for concrete block. To address that issue, CO2 Bambu has a plaster-based finish with fire-retardant material in the works.

Sandzer-Bell has grown and harvested Guadua bamboo (*Guadua angustifolia*), a thick South American species, for two years in Nicaragua. As a pilot project, CO2 Bambu planted 60,000 Guadua seedlings on 54 hectares (133 acres) last year. Sandzer-Bell hopes to expand to 2,500 hectares (6,200 acres) by 2016, and to use the plantation to generate carbon credits.

At a renovated factory and headquarters outside Granada, CO2 processes bamboo into a three-layered plywood that resembles regular plywood. Sandzer-Bell plans to sell the plywood in prefab housing kits, and hopes to ship several containers of the housing to Haiti as early as next month. "We are creating detailed [instructions] which make it possible for any reasonably trained builder to assemble our kits in the field," he says.

—Blake Schmidt

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## Centerpiece

## Eyes on watershed as Panama widens canal

Panama City, Panama

**A**s Panama embarks on a US\$5.2 billion effort to widen the Panama Canal and double its shipping capacity by 2025, environmentalists and engineers alike are keeping their fingers crossed that the country won't compromise a key watershed in the process.

Since the Panama Canal was completed in 1914, the Chagres River and Gatun Lake watershed has provided the all-important water needed to fill the locks of the world's most important commercial canal. The watershed also has supplied drinking water for fast-growing Panama City, whose population now stands at two million.

The canal widening, which started last August and is scheduled to be completed in time to mark the canal's 100th anniversary in 2014, involves building a third set of locks that will be 40% longer and 60% wider than the current lock system.

The locks are used to raise and lower ships heading to and from Gatun Lake, the transisthmian body of water that sits 26 meters (85 feet) above sea level and represents the majority of the 80-kilometer (50-mile) passage between the Atlantic and Pacific oceans. The new locks will accommodate so-called Post-Panamax ships, which can carry three times the cargo load of the largest vessels that currently squeeze through the canal.

But the new locks could also put an additional strain on the watershed. Even before the expansion project was proposed, the Panama Canal was already a water-guzzler, consuming some 55 million gallons of fresh water each time a ship passes through the locks. The canal averages 38 transits a day, for a total daily water consumption of more than 2 billion gallons. By comparison, the entire population of Panama City consumes around 200 million

gallons of water each day, or roughly the same amount used by four ship passages through the locks.

The Panama Canal Authority, known here as ACP, its Spanish acronym, insists all of its studies show there is sufficient water to run the expanded canal at full capacity for a planning horizon of 25 years. Jorge de la Guardia, executive manager for the locks project, says independent studies conducted by the U.S. Army Corps of Engineers' Hydrologic Engineering Center in Davis, California, confirm an adequate water supply with a "99% level of confidence."

De la Guardia insists the canal does not waste water, as some conservationists allege. "There are lots of rivers that naturally dump that much water into the ocean each day," he says. At the canal, he adds, "We're not dumping water in the ocean, we are using it profitably."

Still, those charged with safeguarding the watershed that supplies the canal warn Panama's natural resources must be protected as a long-term investment, rather than viewed as a source of immediate commercial profit. "Without these natural resources, it's difficult to imagine the country could prosper," says Rosamaría Guerra, executive director of the Chagres National Park Foundation, which was created in 1985 to protect the main water basin supplying the Panama Canal.

Chagres National Park contains the sources of three rivers: the Chagres, the San Juan de Pequeñí and the Boquerón. Together, these rivers supply 40% of the water needed for the canal and 80% of the drinking water for Panama City and the city of Colón.

The 130,000-hectare (321,000-acre) park is also home to 114 species of mammals, 396 bird species, 95 reptile varieties and 79 species of amphibian, according to Guerra. The park's diverse wildlife, including the endemic stripe-checked woodpecker (*Piculus collotus*), the majestic harpy eagle (*Harpia harpyja*), the rare cocle salamander (*Bolitoglossa schizodactyla*) and the endangered brown-headed spider monkey (*Ateles fusciceps*), also have become an important ecotourism draw.



An artist's rendering shows the installation of new locks along the Panama Canal. The locks will feature a system of basins to allow the reuse of water from one lock chamber to the next. The system was designed in response to concern that an earlier canal-expansion plan would result in excessive water consumption.

Last year, more than 100,000 tourists came to the area to nature-watch and visit villages of the indigenous Emberá people along the banks of the Chagres.

Guerra says conservation of the park isn't enough; the area also needs to be reforested to maintain animal habitat and protect the watershed. She points out that the dry months of summer are becoming increasingly severe and falling water levels in the rivers and smaller lakes is "becoming more evident each year, and is a great source of concern to the people who live along the riverbanks."

Failure to act now, she warns, could push the region past an ecological point of no return.

"People need to understand that reforestation is fundamental because it reestablishes affected ecosystems," Guerra says. "If there is no forest, there will be no habitat for the animals or birds, which would mean an end to tourism, which would mean no more jobs would be created and those who have jobs would lose their source of income."

Ocean commerce, therefore, should not be Panama's only concern in protecting its forests and main watershed. Says Guerra: "This park plays a strategic role in [Panama's] life, biodiversity, economy and culture."

De la Guardia, the locks-project manager, insists the ACP considers environmental conservation a key to the long-term viability of the canal and to the financing of the canal expansion. He says lenders insisted on strict environmental assurances before agreeing to provide the US\$2.3 billion required in outside financing for the project, and will monitor environmental-protection efforts.



Chagres National Park has become a powerful ecotourism draw, thanks to an abundance of wildlife species ranging from harpy eagles to spider monkeys. The business has created an economic incentive for water conservation and habitat protection.

(Photo by Tim Rogers)

The ACP's conservation steps center on the design of the new lock system, which includes a series of basins that allow water to be reused from one lock chamber to the next. As a result, 60% of the water that enters the lock system from Gatun Lake will be reused in more than one chamber before eventually making its way to the sea. So instead of using 230% more water than the existing lock system (which, based on the size of the expanded locks, is how much more water they would require), the bigger locks will actually consume 7% less than the existing lock system, De la Guardia claims.

"It's not the cheapest solution, but it makes sure we are maximizing the use of the existing watershed without affecting other areas," De la Guardia says. "It would have been cheaper to build a new lake, but this was the solution that was the most environmentally and socially acceptable."

Such environmental considerations, De la Guardia argues, mark a dramatic shift in the engineering paradigm employed in construction of the original canal at the beginning of the last century. The original lock system, he says, was designed entirely on previous ship-navigation experience, with no regard for environmental conservation. Still, he asserts, the engineers got lucky and unintentionally built a system that has protected Gatun Lake from serious levels of saltwater intrusion over the past century.

Had the original lock system been built with two chambers instead of three on each side of Gatun Lake, ocean water would have filtered into Gatun, making it a saltwater lake over the years. But De la Guardia says testing has shown that diluted salt water intrusion past the second chamber of the locks is completely flushed out by the third chamber, making the saline level in the lake "basically imperceptible." (The smaller Miraflores Lake, which sits between the second and third locks on the Pacific side, does have an elevated saline count, independent studies show.) Says De la Guardia: "That wasn't by design, but it turned out well."

A century later, he asserts, engineers are not leaving such considerations to chance.

"This time everything is very scientific," he says. "We have

A tight fit for many ships, the canal is getting new locks that are 40% longer and 60% wider than the current ones. It will be able to handle vessels that carry up to three times more cargo than the biggest ships now using the canal. (Photos by Tim Rogers)

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## Documents:

Environmental Impact and  
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done very profound water-quality studies and we are developing a new three-dimensional model to monitor the quality of water in Gatun Lake.”

De la Guardia adds that if there is a measured increase in the lake’s saline content from the new locks, the whole system can be flushed and cleaned.

The head engineer says the ACP also is preparing for global-warming impacts by building the lock walls higher than originally planned in case ocean levels rise over the next century. “Climate change has been in the back of our minds, but it’s a difficult thing to measure,” De la Guardia says. More worrisome, he says, are the periodic El Niño drought cycles, especially since there has been a slight drop in the level of Gatun Lake since 1970.

Engineers say that as the population in Panama’s booming capital city continues to grow and shipping traffic increases, the water quality and levels of Gatun Lake will need to be checked continually.

In normal years, the area’s watershed will have enough water to supply the canal and the so-called third lane at full tilt, but the demand is growing. “By 2030 we are going to need to look for additional sources of water,” De la Guardia says.

John Reid, president of Conservation Strategy Fund, a nonprofit that specializes in applying economic expertise to developing-world conservation issues, analyzed the original canal-expansion proposal in 2000. Reid says the current plan is much less intrusive. The original plan called for the damming of three rivers and piping water from their reservoirs into Gatun Lake, a proposal that was extremely expensive and controversial—particularly among farmers it would displace.

Reid forecasts the environmental impact of the redesigned project will most likely be “modest in comparison,” adding that the canal expansion is less invasive than several other government damming and gold mine projects underway in other parts of Panama.

Reid also notes that in the case of the canal, everyone—regardless of motive—has a strong interest in preserving the watershed and its surrounding forest.

“The Canal Authority has an economic incentive to keep the watershed forest to prevent erosion [and silt buildup],” says Reid. (See Q&A—this issue.)

Indeed, the ACP claims it has an ambitious reforestation plan that will focus on the western edge of the watershed. There, land clearing by campesinos along several smaller rivers has boosted sedimentation and seasonal drying.

Yet some experts are less inclined to give the ACP the benefit of the environmental doubt. Ariel Rodríguez, a professor of zoology, ecology and environmental sciences at the University

of Panama, questions the Canal Authority’s statistics, projections and intentions.

In addition to challenging the ACP’s figures regarding the salinity of the lake water, Rodríguez cites multiple comparative studies suggesting that by 2020, the canal’s real water consumption will be more than double what the ACP projects.

The professor also argues that the

ACP is underestimating the increased water consumption of the region’s growing human population. Charges Rodríguez: “The ACP is expert in maintaining appearances and lying.”

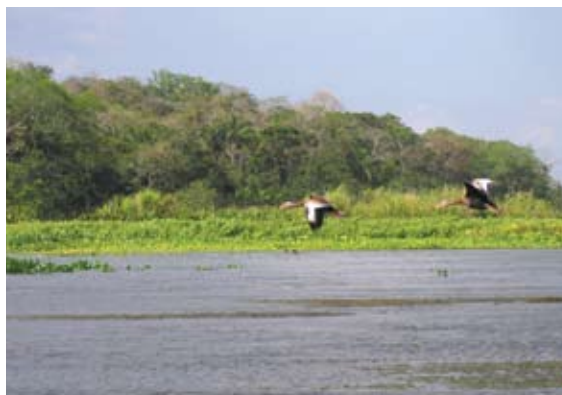
According to Rodríguez, the current absence of organized opposition to the canal expansion is not due to a lack of grounds for objections but, rather, to a weak civil society in Panama. The professor also blames the national media, which benefited from the ACP’s strong advertising campaign prior to the referendum vote in Oct. 2006, for failing to inform the public about the project’s true risks.

Rodríguez acknowledges that a campaign to oppose the canal expansion has quieted considerably. Several formerly outspoken critics of the project did not respond to invitations to comment for this article.

However, if all goes according to the ACP’s long-term plan, environmentalists—or their children—might get a second chance to mount a strong anti-expansion plans in the future.

De la Guardia says a another canal expansion project is not out of the question 30 to 50 years from now. He adds: “We are building the third lane now, but we are already thinking of the fourth lane.”

—Tim Rogers



The Chagres River and Gatun Lake watershed provide water not only for the Panama Canal, Panama City and the city of Colón; it also supports a wide variety of plant and animal life. (Photo by Tim Rogers)



## Impact studies continued from page 1

into an engine of growth. Martinelli pledged in his July 2009 inauguration speech to make Panama “the best place in Latin America to do business.”

Panama has awarded 157,000 hectares (390,000 acres) in mining concessions for gold, copper and other minerals. Two planned copper mines, one in the central part of the country and the other in the western region, promise to be among the world’s largest, with an estimated 45 billion pounds of copper reserves between them. Experts say that if reserves of that magnitude are tapped, Panama eventually could become the world’s second leading producer of copper after Chile.

The government worries too many delays and too much red tape could drive away billions of dollars in potential Canadian, Korean, and American investment, the analysts say.

“This government gives more weight to foreign investment and economic growth than to the environment,” says Raúl Leis, a sociology professor at the University of Panama in Panama City. “From its perspective, environmental impact studies are costly to companies forced to adjust their plans and an obstacle to negotiations with foreign investors.”

### Power to waive

If the new legislation, known simply as Law 30, is implemented as approved, the government—and investors—presumably will no longer have such concerns. The bill empowers the president and his cabinet to dispense with environmental-impact studies for a given project and instead oblige an investor to abide by so-called best practices guides. These guides will concern conduct, but they will not involve expensive ecosystem studies or time-consuming consultation with communities as before.

“Believe me, this is what’s best. It’s what’s best for the people,” Martinelli said after the passage of the environmental-impact measure, which formed part of a catch-all bill that also included labor, legal and aviation reforms.

Panama’s new legislation runs counter to trends in the rest of Central America, where concerns about the use in mining of toxic chemicals in flood-prone tropical forests have pushed some leaders in an entirely different direction. Costa Rican President Laura Chinchilla banned all new open-pit gold mining within hours of taking office in May. El Salvador’s president is considering a ban on all types of mining. And the leaders of Guatemala and Honduras say they will not approve new mining projects until environmental regulations can be strengthened.

“In weakening its obligation to control and monitor industries that have an effect on

the environment and human rights of local communities, Panama’s government violates numerous international environmental agreements it has signed, including the 1992 Rio Declaration on Environment and Development and the 1993 Convention on Biological Diversity, which call for performing environmental impact studies and preventing environmental degradation,” says Astrid Puentes, an environmental lawyer and co-director of the Oakland, California-based Interamerican Association for Environmental Defense (Aida). “It also might violate free-trade agreements, like the Central American Free Trade Agreement (Cafta) with the United States, which prohibit countries from weakening their environmental legislation to attract foreign investment.”

### Attention on mines

Among the focal points for such concern are the plans for two copper mines. Canada’s Inmet Mining, in partnership with a group of Korean companies, is set to begin construction in 2012 of a US\$5 billion open-pit mine known as Cobre Panama, with estimated reserves of 20 billion pounds of copper and 5 million ounces of gold. The mine, which would straddle the border of Coclé and Colón provinces, would create an estimated 5,000 temporary jobs during construction as well as 1,500 ongoing positions. But the project site overlaps with the Mesoamerican Biological Corridor, a conservation area established in 1998 by Central American countries and Mexico in large part to prevent dozens of critically endangered species from going extinct.

Within the next six months, the government also will open bidding on the 25-billion-pound, open-pit Cerro Colorado copper mine. But that mine, in the western state of Chiriquí, lies in the middle of a semi-autonomous “comarca” or reservation occupied by 170,000 Ngöbe and Buglé indigenous people as well as the San Félix watershed, which drains into the some of the most diverse mangrove forest on Central America’s Pacific coast.

Government officials say thousands of indigenous people might have to be relocated to make way for the mine’s construction.

“The government believes it convenient to eliminate environmental-impact studies,” says Félix Wing, legal director of the nonprofit Environmental Advocacy Center (Ciam) in Panama City. “But those studies are the only instrument local communities have to find out what is going to happen on their lands and how they will be affected. It is their only way of insisting their concerns be taken into account.”

—Steven Ambrus

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Olive ridley  
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olive ridley species (*Lepidochelys olivacea*), which is the smallest and most populous sea turtle and is officially listed as “vulnerable.”

According to Perla Torres, Fauna and Flora’s technical assistant for the Astillero project, the egg-relocation process saves untold thousands of eggs from being trampled by other turtles or eaten by predators. And in the hatchery, she says, the eggs also are shielded from the sun and other natural threats, such as flood-swollen rivers that can wash out nesting sites.

So perilous is the existence of a turtle egg in the wild, she points out, that only 2% of olive ridleys hatch and reach the ocean, while only 1 of 1,000 survive to adulthood. In the hatchery, however, the odds of the turtles surviving long enough to make it to the sea increase to around 60-80%, Torres says.

Last January, dozens of children from the community helped release some 22,800 newly hatched olive ridley sea turtles into the sea, hoping they will return to their native beach in 10 to 12 years to lay their own eggs.

#### Will they return?

Torres and the community of Astillero are banking on the theory that through the process of imprinting, newly hatched turtles will be able to travel the seas as far away as Chile (3,500 kilometers, or 2,200 miles, south) and return after a decade to lay their own eggs on the beach of their birth.

If so, Astillero at least potentially could become a natural nesting site again within 10 or 15 years, according to project organizers. Says Torres: “This is a long-term project.”

One of the world’s leading sea-turtle conservation experts thinks it might not be that easy. Peter Pritchard, a zoologist who directs the Chelonian Research Institute, an international nonprofit engaged in the study and conservation of sea turtles and tortoises, says studies on the effectiveness of egg-relocation programs are “incomplete.”

Pritchard notes that efforts in the 1960s to relocate olive ridley sea turtles 100 miles north of the Mexican coastline to Texas’s Padre Island National Seashore led to the curious result of increasing turtle colonies both in Mexico and on Padre Island.

Similar turtle-nesting relocation experiments in the 1970s suggested that turtles born in hatcheries in Florida appeared to be nesting a decade later in a smattering of sites along the South Carolina coast.

Those results, Pritchard says, suggest that imprinting might not be as precise as some believe—or might not even occur.

“We assume there is this miracle of navigation, but imprinting is still a theory, and it

may not be happening at all,” he says.

Pritchard adds that it’s possible olive ridley turtles hatched in Costa Rica and neighboring Nicaragua are returning to nest in the general geographical neighborhood where they were born, rather than the exact beach. “It’s possible that nesting sites in southwestern Nicaragua overlap with Costa Rica partially or completely,” he says.

By tagging adult turtles with satellite transmitters, Pritchard explains, zoologists have determined that the olive ridley does have an “elaborate and precise route” that it swims in the ocean. But because the battery life of the transmitters never lasts much more than a year, scientists have been unable to learn much more about the turtles’ migration patterns.

#### Mysterious species

In fact, Pritchard asserts, given the relative “abundance” of the olive ridley sea turtle, “the lack of information about this species is embarrassing.” He says little is known about the turtles’ feeding habits, and even less is known about the turtle’s first 10 years of life, before they lumber out of the sea again to lay eggs. “It is very rare to see an immature olive ridley,” he said.

The turtle conservationist also questions the long-term effectiveness of protecting the olive ridley nesting sites. Pritchard says increasing the size of arribadas can ultimately become counterproductive, when too many turtles arrive and trample one another’s nests, converting the beach into a wasteland of rotten eggs. Unlike other species of turtle that nest every three years or so, the olive ridley can lay eggs several times each year, resulting in traffic jams on some beaches.

“The arribada can be its own worst enemy,” Pritchard says. “These turtles are programmed to join larger cohorts for nesting, but when the population gets too big there is no ‘off’ switch. In that sense, an enormous population of olive ridleys could choke on its own vomit, while a smaller population becomes more invigorating with an exciting future.”

The irony of olive ridley conservation, he says, is that some of the sites where the turtles are protected are becoming unsustainable nesting grounds, while sites where the eggs are still poached remain dynamic.

But in Astillero, enthusiasm for turtle conservation has taken on a dynamic all its own. “I love the turtles,” says nine-year-old community member Josep Villagra, as he delicately examines one of the newborn hatchlings before releasing it into the ocean. “They’re pretty.”

—Tim Rogers

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“We are going to have to establish very clear regulations to ensure that development activities occur in appropriate places and with the appropriate technology, so that things like mining happen outside protected areas and strategic ecosystems,” Bessudo told EcoAméricas. “We also are going to be negotiating actively at all the international biodiversity and climate change meetings. President Santos has told me and international leaders that the environment will have a fundamental importance in this government.”

Bessudo is widely known as a fighter. In 2004, she spotted a speed boat hunting hammerhead sharks in the area of Malpelo, 330 kilometers (205 miles) off the Pacific coast. The boat was engaged in the shark-finning trade for the East Asian market, so she and a couple colleagues set off in hot pursuit of the boat in their small dingy.

But the boat did not stop. Instead, its captain quickly cut his drift nets, held high a hammerhead shark oozing blood from its gills, made an obscene gesture in mockery and outraced the dingy to the open sea.

“We are helpless,” Bessudo told EcoAméricas at the time. “Neither the people working here nor the navy have the boats required to patrol these marine areas.”

Yet Bessudo played a central role later that year in the creation of the 211-million-hectare (521-million-acre) Pacific Marine Biological Corridor, which is bounded by Ecuadorian, Costa Rican, Panamanian and Colombian islands in the eastern tropical Pacific and which seeks to protect migratory marine creatures such as whales, sea turtles and sharks.

She successfully pressed the Colombian navy to dedicate two large Coast Guard cutters to the interception of illegal fishing boats in Colombia's

Pacific waters. And she has played a direct role in fighting the illegal fishing trade, most recently in June, when she accompanied the navy in its capture of an Ecuadorian fishing boat with 10 tons of illegal tuna and 23 crew aboard.

For her many efforts, Bessudo in 2007 was given a Whitley Award—one of the world's top conservation prizes—by Britain's Whitley Fund for Nature (WFN).

“Bessudo is a crusader who has had a significant influence in the creation of marine protected areas of international importance,” says Fabio Arjona, executive director of Conservation International in Colombia. “She will be an excellent minister.”

**Follow-up:** Fabio Arjona, Executive Director, Conservation International in Colombia, Bogotá, Colombia, +(571) 345-2851, [farjona@conservation.org](mailto:farjona@conservation.org); Mariam Hadra, Press Director, Ministry of the Environment, Housing and Territorial Development, Bogotá, +(571) 332-3632, [mhadra@minambiente.gov.co](mailto:mhadra@minambiente.gov.co).



**After long wait, Brazilian waste bill to become law**

Brazil's Senate this month passed the country's first national solid-waste management bill, breaking a 16-year legislative logjam on the issue.

The Chamber of Deputies, the lower house of Congress, had passed the bill in March, setting the stage for the July 8 Senate approval. As the Senate made only a minor change in the bill, the legislation need not go back to the Chamber for a final vote. Brazilian President Luiz Inácio Lula da Silva is expected to sign the bill into law this month or next.

The legislation addresses a broad swath of waste issues, including provisions on local, state and federal solid-waste management plans; hazardous-waste handling; recycling; the development of new sani-

tary landfills; and the illegal dumping and burning of solid waste. (See “National waste bill nears passage in Brazil,”—EcoAméricas, March '10).

Although the bill is quite generic, it gets specific by requiring businesses involved in plastic, metal and glass packaging—from producers to sellers—to forge sectoral agreements that ensure the collection and recycling of those materials.

It also requires the same sectoral collection and recycling agreements for goods that, once discarded, could harm human health and the environment.

Implementing legislation, likely to be drafted by Conama in the form of resolutions or by presidential decrees, will address how producers, importers, distributors and sellers of recyclable materials should create sectoral collection and recycling systems.

**Follow-up:** Samyra Crespo, National Secretary of Environmental Issues, Brazilian Environment Ministry, Brasilia, Brazil, +(55 61) 2028-1430, fax +(55 61) 2028-1576, [samyra.crespo@mma.gov.br](mailto:samyra.crespo@mma.gov.br). For House of Deputies version of the bill, minimally changed by the Senate, (in Portuguese): [www.camara.gov.br/sileg/inte\\_gras/743207.pdf](http://www.camara.gov.br/sileg/inte_gras/743207.pdf).



**Argentine bill takes aim at burgeoning dove population**

Legislation filed last month in the Argentine Congress would declare the eared dove (*Zenaidura macroura*) a plague.

The bird, a close relative to the North American mourning dove, is being blamed by supporters of the legislation for causing significant agricultural losses.

Ulises Forte, the bill's sponsor in the lower chamber of Congress, says the bird poses a threat to human health and the environment. Populations of the eared dove, a common bird in South America, have

grown rapidly in Argentina.

“In my province [La Pampa], where the sunflower yield is about 2,000 kilos per hectare, the doves, which peck and eat the cultivations, have managed to ruin up to 60% of the [sunflower] crop,” Forte told reporters recently. “This is about not having the farmers take steps in an anarchic way to combat the doves, which is what is happening today,” he says. “It's time for the government to take their place.”

If the bill is approved, it would create a National Dove Population Control Program within the Argentine Agriculture, Ranching and Fishing Ministry, which would determine what parts of the country have over-populations of doves and would identify steps to address the problem.

Doves also are regarded as an urban problem here, thanks in large part to the toll their droppings take on buildings and monuments.

A 1947 law enacted on national-defense grounds prohibits recreational hunting of doves and their killing for whatever reason.

But the measure, rooted in assumptions at the time that doves might be used for military communications, does not appear to be enforced.

Today, businesses openly provide agricultural operations with dove-killing services, and dove-shooting tours are offered for foreign hunters.

In the northern province of Chaco, the provincial legislature last year declared its “concern” about economic damage doves were causing to agriculture and called on provincial authorities to take steps to control dove populations.

**Follow-up:** Ulises Forte, Member, Argentine Chamber of Deputies, Buenos Aires, Argentina, +(54 11) 6310-7100, [uforte@diputados.gov.ar](mailto:uforte@diputados.gov.ar); Sergio Levitán, General Secretary, Argentine Dove Association, Buenos Aires, +(54 11) 4240-3003, [slevitan@gmail.com](mailto:slevitan@gmail.com).

## Q&amp;A:

# Making economics part of the conservation equation

John Reid is founder and president of the Conservation Strategy Fund (CSF), a Sebastopol, California-based nonprofit that promotes the application of economic analysis to conservation issues in the developing world. Recently, the group has been focusing on three Latin American countries—Brazil, Bolivia and Peru. Reid, who holds a master's degree in public policy from Harvard University, has led CSF's efforts to provide economics training for conservation professionals. Most recipients of the trainings are staff members of nonprofit environmental groups, but CSF is working increasingly with public-sector professionals as well. Following the training, CSF often performs field analysis of specific conservation questions facing its students in their work. CSF is supported by foundations, the U.S. Agency for International Development, the U.S. Forest Service, individual donors and students' tuition payments. Reid spoke recently with EcoAméricas Editor & Publisher George Hatch.



John Reid

## How did you come to this work?

In the mid-1990s I was working for Conservation International as an economist in Latin America and saw a big gap between the conservation community and the economics profession. The conservation community saw economics as evil, and economists were indifferent to nature conservation. What took shape in my mind was a brand new organization, which became Conservation Strategy Fund. It would show committed conservation professionals what economics could do for them, and go out with them to apply those tools in the field.

## What economics skills do you emphasize in your training?

In general, our courses cover microeconomics, environmental valuation, natural resource economics and cost-benefit analysis. Trainees gain basic literacy in economics and a firm grasp of how it applies to environment and natural resources. After the courses, our students show us where the economic tools can benefit conservation. Our students have drawn CSF into a lot of infrastructure-development debates, identifying when projects have valid justification and when they are white elephants. An example of the latter is Highway BR-319 in Brazil, a project to link Manaus, in the center of the Amazon region, to the rest of the country's road network. The project was to reopen a 70s-era road that was cut through forest and then abandoned for lack of use. We did two analyses of it in 2009. One, on the economic return of the road itself, found the road would have a net loss of US\$150 million during the 25-year time horizon of our study. That result told Brazilians the road would likely cause deforestation by attracting settlers and would not even return sufficient benefits to pay for its construction. Meanwhile, the environment minister at the time set conditions for its approval, among them that there be adequate funding to maintain protected areas along the road. One of our training graduates in the Amazonas state environmental agency asked us to help estimate the costs of that protection. The government adopted our estimate, which was roughly equal to the project's construction cost. The conditions haven't yet been met, and the project has not gone forward. This case shows that by making economic arguments that a project doesn't contribute to the

national wealth, a broader constituency can be developed to look for better options.

## Do you address environmental services?

The environmental services work we've been most engaged in is developing a proposal for the state of Rio de Janeiro to build specific charges into its water bills to help fund protection of state parkland encompassing the watershed that runs into Guanabara Bay. We're working with the state, Conservation International and other partners to implement it. Many people have high hopes for environmental services, but they are a niche solution, not a panacea. A possible exception is Redd [Reducing Emissions from Deforestation and Forest Degradation, a concept to curb developing-world deforestation—and, thus, greenhouse emissions—by awarding marketable carbon credits for that work]. In that case, payments can have climate and biodiversity benefits over vast areas, and there's a realistic way to create a property right for the service. The U.S. and United Nations policy processes needed to unleash demand for Redd are at a standstill; but when this mechanism happens, the potential conservation funding will be unprecedented. So we incorporate Redd in our trainings, and our teams in Bolivia and Peru are quantifying the costs of Redd in the field.

tic way to create a property right for the service. The U.S. and United Nations policy processes needed to unleash demand for Redd are at a standstill; but when this mechanism happens, the potential conservation funding will be unprecedented. So we incorporate Redd in our trainings, and our teams in Bolivia and Peru are quantifying the costs of Redd in the field.

## Please give more examples of your analyses affecting conservation.

One would be Barú Volcano National Park in Panama. In 2003, we were asked by the Nature Conservancy and local community activists to analyze a proposed road through the park. We showed that an alternative route, around the park, made more economic sense. The study helped lead the government to choose the alternate route. In another example, in 2000, we helped one of our trainees compare incomes in two indigenous communities in the Peruvian Amazon. One had been reached by a jungle road and one was in a remote area where people were living traditionally. We found that the people living deep in the forest were economically much better off. Our trainee, Carmela Landeo, used the research to support the creation of the 400,000-hectare [990,000-acre] Amarakaeri Communal Reserve, demonstrating how Indians could benefit by controlling their development path. She later became director of the nearby Tambopata National Reserve. A third example is unfolding right now. CSF is working with Brazil's park service on bringing in private-sector business partners to provide the kinds of services in national parks that will allow people to visit. The project is reminiscent of the Stephen Mather era of the U.S. National Park Service, when concessionaires were brought in to provide services that helped Americans visit parks. We're analyzing concession possibilities and helping the government set up concessions and divide the returns equitably between entrepreneurs and parks. Connecting people and their parks is crucial to long-term public support for conservation. The payoff for nature will be huge and will touch every corner of this highly biodiverse nation. Initiatives like these show that when environmentalists bring their economic wits to the table, there's almost no development project that can't be made better, and no conservation initiative that can't be made more likely to succeed.