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Saving Biodiversity at the Crossroads of the Americas

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ESSAY

**SAVING BIODIVERSITY AT THE CROSSROADS OF THE
AMERICAS**

*Colin Crawford**

This paper will examine the ecological status and prospects of Panama's reverted areas, meaning those areas returned to the country with the reversion of sovereignty over the Panama Canal lands. Following an introductory Part I that highlights Panama's biological diversity, Part II will isolate some of the development pressures facing the reverted areas and those closest to central Panama City in particular. In addition, Part II will describe the extent of the reverted areas and identify their biological, environmental,

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social and economic value both to Panama City and the Republic. Part III will discuss the importance of protecting the reverted areas in light of global accords on biodiversity and tropical forest protection. Part III will additionally consider existing legal protections under Panamanian law and identify other examples of the legal protection of protected areas and biodiversity in the region by suggesting ways in which the Panamanian legal protections might be strengthened. Finally, Part IV will consider the prospects for successful protection of the reverted areas and will conclude with justifications and recommendations for a successful strategy to ensure the long-term viability of the reverted areas as protected areas and biodiversity havens.

I. Introduction: Panama's Threatened Reverted Areas

In Panama City, Panama, construction is underway for a Biodiversity Museum. This is unsurprising; tropical Panama constitutes a biodiversity "hotspot", a place distinguished by the richness of its flora and fauna, and therefore meriting special protection.¹ Panama City, along with the Panama Canal, sits at the center of one of the world's most biologically diverse areas: Southern Central America. The area has more forest bird species than any other region in the world, except Amazonia and the northern and central Andes, each of which is vastly larger than southern Central America. Furthermore, Panama has as many plant species per 10,000 km² as any region in the world, more than Ama-

¹ The phrase is typically credited to the British ecologist Norman Myers. See, e.g., John C. Kunich, *Fiddling Around While the Hotspots Burn Out*, 14 Geo. Int'l Envtl. L. Rev. 179 (2001) (explaining that the country is estimated to be the home to 10,000 species, of which 1,500 are endemic). See also Mireya Correa, *Diversidad en la flora de Panamá*, in *Panamá: Puente Biológico* 70-73 (Stanley Heckadon-Moreno, ed. 2001).

zonia or the Malay Peninsula.² This biological richness results largely from the geographic distinctiveness of the nation's location. As a bridge between the American continents, the country sits at the bottom territory of many species in the northern hemisphere and the top territory of many southern hemisphere species.³

The effort to build a Biodiversity Museum in this truly and symbolically central location must be recognized as both appropriate and laudable. The museum, designed by the world famous architect Frank Gehry, who has visited the country for years with his Panamanian wife,⁴ will be the architect's first project in Latin America. It will sit on a spit of land known as "la Calzada de Amador," a tongue of land created during Canal construction with fill material, at the Canal's Pacific entrance.⁵ The museum's design will reflect the sinuous curves and organic shapes for which Gehry is famous, and is to be richly colored in keeping with its tropical setting. Advance publicity for the Biodiversity Museum promises that the institution "[i]ntends to reflect the growing global concern for the environment and conservation, and at the same time explain to the world Panama's extraordinary natural patrimony."⁶

² Robert Condit et al., *The Status of the Panama Canal Watershed and its Biodiversity at the Beginning of the 21st Century*, 51 BIOSCIENCE 389 (2001).

³ The Nature Conservancy, *About Panama*, <http://www.nature.org/wherewework/centralamerica/panama/work/art19165.html?src=search> (last visited Apr. 7, 2008).

⁴ This is only the most recent of many projects Gehry has imagined for Panama. See Colin Crawford, *Stop the Locks Schlock*, Salon.com, Oct. 5, 1999, <http://salon.com/people/feature/1999/10/05/panama/print/html> (last visited Oct. 12, 2007) (describing an architect's vision for the design of the third set of locks on the Panama Canal).

⁵ Bertilda Herrera, *Museo de la Biodiversidad: un Puente de Vida*, LA ESTRELLA PANAMÁ, Dec. 3, 2007, at D-1.

⁶ *Id.* ("Pretende reflejar la creciente preocupación mundial por el medio ambiente y su conservación, y a la vez difundir al mundo el extraordinario patrimonio natural de Panamá.")

On the other hand, the effort to build a Biodiversity Museum in Panama City might be seen as oddly sentimental, a tribute to a value that the country's planners and its foreign investors do not in fact support. Despite the glamorous attention the subject of biodiversity may garner in the capital city's waterfront, with its dizzying high-rise growth and the promise of a larger development of a greenbelt of which the Biodiversity Museum will be but one feature⁷, urban biodiversity is not receiving the attention and public concern one would hope for in a country blessed with Panama's biodiversity riches.

This is lamentable in the wake of the transfer of power for the Panama Canal because even in its most urbanized and densely settled corridor—the stretch of land surrounding the Canal, from Panama City on the Pacific to Colón on the Caribbean side—includes a largely untouched tropical forest, itself rich in biodiversity. These are part of the so-called “reverted areas” (*áreas revertidas*)—the lands returned by the United States government to the Republic of Panama along with the Panama Canal in 1990.⁸

II. Panama's Reverted Areas

As a small country in a strategic location, it is impossible to consider the treatment of the reverted areas without keeping in mind the national policy for management of the country's major commercial asset, the Panama Canal. This is especially true considering the environmentally sensitive reverted areas, which surround this important economic resource. The future construction of a third set of locks for

⁷ Urania Cecilia Molina, *Cinta Costera Va*, LA PRENSA PANAMA, Mar. 17, 2007, at 1A.

⁸ See Sarah N. Whitney, *Will Goals Be Met? An Examination of ARI's General and Regional Plans With Respect to Protected Areas Within the Inter-Oceanic Region, Panama*, in, PROTECTING WATERSHED AREAS: CASE OF THE PANAMA CANAL 93, 93-94 (Mark S. Ashton, Jennifer L. O'Hara & Robert D. Hauff, eds., 1999).

the Canal promises to further damage Panama's biodiversity: "[t]he destruction and fragmentation of some 490 hectares of forests will result in the loss of terrestrial ecosystems, particular species and genetic diversity of flora and fauna."⁹ This is significant because habitat reduction not only reduces territorial size, but also impairs genetic diversity and weakens populations.¹⁰ Given that the construction of the third set of locks is now a *fait accompli*¹¹ is all but more reason to emphasize the importance of protecting the biological riches in the other reverted areas. As many Panamanian commentators have noted, it is regrettable that the movement, supported by the Panama Canal Authority and President Martín Torrijos, to build the third set of locks did not proceed "with the insertion of a national development plan"¹² that would have, among other factors, considered long-term environmental sustainability.

a. Extent

The territory constituting reverted areas—returned to Panama after the departure of the U.S.-controlled Panama Canal Authority in 1990¹³—includes land that is both public and private, causing extreme protection challenges. In 1952, 85% of the land in the Panama Canal Watershed was forested. However, with development, some of this land has been converted to pasture and agricultural use. By 1993, the government undertook the creation of a system of

⁹ Fernando Manfredo, *Canal de Panamá y Medio Ambiente*, 126 TAREAS 103, (May-Aug. 2007) (the author is the ex-Administrator of the Panama Canal Commission).

¹⁰ *Id.*

¹¹ Carmen G. Gonzalez, *Environmental Impact Assessment in Post-Colonial Societies: Reflections on the Proposed Expansion of the Panama Canal*, 4 TENN. J.L. & POL'Y 303 (2008).

¹² *Presentación*, 123 TAREAS 3, (May-Aug. 2006) (introducing a series of articles on the Panama Canal).

¹³ *Id.*

national parks to protect some of this land. As of 1999, 231,000 hectares had “protected status” while slightly less than half of that was characterized as “protected forest.” One explanation for this differential is that 30% of the land is privately held, making administration and enforcement much more difficult.¹⁴ The Canal itself is surrounded by a swath of land 50 miles long and 10 miles wide, still mostly untouched, owing both to the creation of the national parks and because it was under U.S. military control and as a result was not subject to development pressures.¹⁵

The reverted areas also contain Panama City’s Metropolitan Park (*Parque Metropolitano*), a precious forest and biodiversity reserve of 190 hectares in the heart of the city. “Park” is, in this context, a deceptive term, since it may conjure up the image of an urban oasis that serves multiple needs—such as recreation, family picnics and walks on paved trails. In fact, Panama City’s Metropolitan Park consists of largely untouched tropical forest, despite its location in the heart of the most densely populated area in the Republic of Panama. The Park alone contains fifty-

¹⁴ Jennifer L. O’Hara, *Introduction: The Panama Canal Watershed Area*, in *PROTECTING WATERSHED AREAS: CASE OF THE PANAMA CANAL*, 5-6 (Mark S. Ashton, Jennifer L. O’Hara and Robert D. Hauff, eds., 1999) (noting that the Panamanian decision to privatize the reverted lands dates back to 1993 as the country prepared to assume control of the Canal lands). See International Monetary Fund, IMF No. 01/41, *PANAMA: RECENT ECONOMIC DEVELOPMENTS 21*, available at <http://www.imf.org/external/pubs/ft/scr/2001/cr0141.pdf> (last visited Feb. 11, 2008).

¹⁵ Whitney, *supra* note 8, at 5. These areas constituted an especially important habitat for migratory birds. See, e.g., Office of the Deputy Under Secretary of Defense (Environmental Security) and the National Fish and Wildlife Foundation, *THE KEY ROLE OF SPECIFIC LANDS IN THE PANAMA CANAL AREA IN PRESERVING THE VALUE OF PANAMA’S NATURAL HERITAGE: A REPORT OF THE PARTNERS IN FLIGHT INTERNATIONAL WORKING GROUP FOR THE PRESERVATION OF MIGRATORY AND RESIDENT BIRDS*, PANAMA CITY, PANAMA, Mar. 14-15 (1996), <http://www.dodpif.org/data/keylands.pdf> (last visited Apr. 15, 2008).

one different bird species.¹⁶ By way of illustrating the threats to the park and other reverted areas, it faces the threat of development and partial or total destruction—either by squatters or by construction for public and private uses.

The reason for this oddity—a tropical forest amidst a bustling city—rests in an odd and unintentionally fortuitous legacy of the U.S. presence in Panama. Specifically, what became the reverted areas were off limits to the Republic of Panama during the colonial control of the Canal Area, not for biodiversity protection reasons, but to protect U.S. activities.

a. Development Pressures and a False Economic Choice

As noted elsewhere in this volume, Panama City is undergoing a real estate boom of epic proportions, one that threatens to wreak huge social transformations in Panamanian society, if it has not already done so.¹⁷ In at least one prominent case—that of the Metropolitan Park—this development threatens the integrity and long term values served by protected areas rich in biodiversity. The Metropolitan Park was the first reverted area of significance.¹⁸ In the early 1980s, a battle began over a highway, the “Northern Corridor” (*Corredor Norte*) that would run through the park. This helped mobilize the Panama Audubon Society (until then primarily a birder’s club) and other nascent environmental non-governmental organizations (NGOs),

¹⁶ Condit et al., *supra* note 2, at 393, Table 1.

¹⁷ See, e.g., Eric Rogers, *Out with the Old in with the New: Housing Issues for the Middle Class in Panama City, Panama*, 4 TENN. J. L. & POL’Y 507 (2008).

¹⁸ Interview with Rosabel Miró, Executive Director, Audubon Society, Panamá, William and Ester Adsett, Board Members, Audubon Society, and Dionara Víques, Director of the Metropolitan Park (Dec. 12, 2007) (notes on file with author).

who were ultimately promised a longer road that would not run through the park and, it was said, benefit more communities. Initially, the NGOs were promised a study that would examine the impact and best route for new highway construction.¹⁹ The project was to be financed as a part of a World Bank highway development project, which included a proposed highway to connect national parks at Boquete and Cerro Punta.²⁰ The NGOs subsequently sought and were promised a law from the National Assembly that would specify what exactly could and could not be done with the park.²¹ At the same time, in 1994, the government sought bids for the construction of a “Southern Corridor” (*Corredor Sur*) highway, without specifying the route. Environmental NGOs, including the Audubon Society, went to the National Assembly and sought to block the construction of the Northern Corridor, which would have run through the Metropolitan Park. They were unsuccessful in this and the highway was built and runs off to one side of the Metropolitan Park, but entirely within its boundaries: “[t]he first thing anyone knew about the change of route was when the park guards found surveyors cutting down trees [in the Metropolitan Park] and laying out the route for the highway,” according to Audubon Society

¹⁹ *Id.* The Panamanian history of promising such studies and not performing them sadly continues until the present as examined by Carmen Gonzalez in her study on the Environmental Impact Assessment process—or lack thereof—in the amplification of the Canal. See Gonzalez, *supra* note 11.

²⁰ Interview, *supra* note 18. The World Bank has funded several highway construction and rehabilitation projects in Panama since the 1980s. See IMPLEMENTATION COMPLETION REPORT (CPL-36860 SCL-3686A) ON A LOAN IN THE AMOUNT OF \$60 MILLION TO THE REPUBLIC OF PANAMA ON A ROADS REHABILITATION PROJECT, http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2004/06/25/000090341_20040625105511/Rendered/INDEX/28372.txt (last visited Apr. 7, 2007).

²¹ See O’Hara, *supra* note 14.

representatives.²² In the words of a former U.S. military contractor who had been there, before and after the road went in, it constituted “an irreversible wound in the middle of the forest.”²³

This method of the highway’s construction provides a litany of examples of exactly what most laws and proposed protected area management plans seek to avoid. Trees were felled without consideration of their ecological value. The principal water source for the park’s many animal species, the Río Curundú, was cut off, leaving many animals to die of thirst.²⁴ In other words, the project appears to have been driven by purely economic considerations and not by a comprehensive vision of protected areas as having distinct environmental, social and economic functions.

Subsequently, the Park management initiated a civil action against the firm responsible for the construction of the Northern Corridor, in light of “the loss of land, flora and fauna”, seeking to have the company “mitigate the harms caused in the Park.”²⁵ This led, in October 1996, to the signing of an agreement for species conservation, scientific investigation, environmental education and economic compensation resulting from the damages caused by the company in the construction of the Northern Corridor.²⁶ Subsequently, in June 1998, the Park management submitted a demand for US \$3.44 million, plus interest, in economic compensation.²⁷ In 2001 and 2005, Panamanian courts issued decisions in favor of the Park management

²² *Id.*

²³ Letter from Jaqueline Howard to author (May 1, 2008) (on file with author).

²⁴ *Id.*

²⁵ Patronato del Parque Natural Metropolitano, Comunicado a la Ciudadanía (Communication to the Citizenry) (on file with author).

²⁶ *Id.* at ¶ 1.

²⁷ *Id.* at ¶3

and its demands.²⁸ Despite further judicial wrangling and hearings favoring the position of the Park, however, their financial demands “for the devastation that affects approximately 33 hectares” of Park territory²⁹ remains unsatisfied. The sorry saga of the Park management’s unsatisfied effort to recover for environmental damage to this reverted—and protected—area underscores how important it is to prevent such damage from happening, rather than trying to impose liability after the fact.

In this and other reverted areas, development-related pressures threaten the long-term integrity of protected areas. For example, in 1995, the government reduced tariffs on some imported agricultural goods in an attempt to enter the World Trade Organization. Some commentators noted a negative, unsurprising reaction by the representatives of workers in the agricultural and livestock industries who worried that this would lead to “an increase in the already elevated number of displaced residents from the interior.”³⁰ At the same time, the Inter-Oceanic Regional Authority (*Autoridad Regional Interoceánica*, or ARI), the entity created specifically to administer the reverted areas, aggressively sought to attract capital investments to generate employment opportunities in the reverted areas, to the extent that it appeared to “be evidence of the Government policy, conscious or not, to promote accelerated migration in these areas of the Metropolitan Region of the City of Panama where the pending negative physical, economic and social effects [to] its population

²⁸ *Id.* at ¶¶4 and 5.

²⁹ *Implementation*, *supra* note 20.

³⁰ Alan Smith Waite, *Municipio, Modernización Administrativa y Desarrollo*, in PLANIFICACION DEL DESARROLLO EN PANAMA: ENSAYOS CRITICOS CONSTRUCTIVOS EN RETROSPECTIVAR, DEL PRESENTE Y DE PROYECCION FUTURA 41 (2000) (“[C]ontribuirá al aumento del número ya elevado de desocupados residentes en el interior del país (The Panamanian author worked at the Organization for American States in the area of housing, development and urban affairs for nearly thirty years.)

were already considered beyond proposals and solutions. The consequence would be to contribute “to the increase in unemployment and underemployment and, as a result, to poverty.”³¹ As Smith Waite notes, “[e]xcessive rural-urban migration has been identified by multiple investigative sources as one of the major economic and social problems for economies in development.”³² Thus, as elsewhere in

³¹ *Id.* at 41-42 (“Aquella decisión, paralela a la agresiva promoción de la Autoridad Regional Interoceánica (ARI) para atraer inversiones de capital que generan oportunidades de empleos en las áreas a la Región Metropolitana de la ciudad de Panamá donde su población ya considera insostenibles los efectos físicos, sociales y económicos negativos pendientes aún de propuestas y soluciones. Estas acciones, fuera de un amplio marco de referencia nacional, contribuirán al aumento de desempleo y subempleo y por consiguiente a la pobreza.”). From the start, despite perfunctory acknowledgements of the importance of “sustainable development”, the ARI’s planning was marked by a desire for intense economic development that appeared aimed principally to secure immediate capital infusions. See ARI, DEVELOPMENT OF REVERTED AREAS WITH PRIVATE SECTOR PARTICIPATION (TC-96-04-21), <http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=461260> (last visited Feb. 10, 2008) (stating ARI’s focus on “efficient utilization of the assets and long term job creation”). See also Whitney, *supra* note 8, at 97 (“ARI’s focus is on economic development in the Inter-Oceanic Region . . . although it also includes natural resources protection as a guiding principle.”), Keely B. Maxwell and Christopher J. Williams, *Working Toward Effective Policy Processes in Panama Canal Watershed National Parks*, in Ashton, O’Hara & Hauff, *supra* note 14, at 151 (noting the ARI’s focus on increasing economic opportunities for an international investment in the reverted areas and concluding that

“[d]evelopment of reverted lands in the Watershed will place additional pressures on existing protected lands by increasing habitat fragmentation and water consumption.”), H. Bradley Kahn, *The Prospects for Integrated Watershed Management in the Panama Canal Watershed*, *id.* at 168n (characterizing the two primary values of the ARI as “wealth and [the desire to receive institutional] respect.”).

³² Alan Smith Waite, *Políticas de Desarrollo Contradictorias*, *supra* note 30, at 46 (“La excesiva migración rural-urbano ha sido señalado

the developing world, ill-considered government policies that prompted increased urban migration would put special pressure on previously undeveloped lands, such as Panama's reverted areas.³³

Furthermore, Panamanian commentators feel that the promises of economic riches said to come with the construction of the third set of locks for the Panama Canal will only increase the country's social inequities. Research "appears to confirm that the extremely optimistic, long term projections of the ACP [the Panama Canal Authority, or Autoridad del Canal de Panamá]. . . will not maintain this level of dynamism for various reasons."³⁴ These reasons include, first, the likely decline in the commercial trade between China and the United States, "which has been the principal driver of movement through the Canal for the last decade."³⁵ Second, global warming threatens to make trade through previous closed routes—due to ice—possible; these routes are preferable since passage through them will be free.³⁶ Third, an increase in the development of multi-modal shipping in the United States will threaten the Canal's viability; "this is the Panama Canal's principal rival with regard to transit coming from Asia in the direction of the East Coast of the United States."³⁷ How is the

por múltiples fuentes investigadoras como uno de los problemas económicos y sociales mejores de las economías en desarrollo.”).

³³ This is famously true, for example, in Rio de Janeiro, where remaining sectors of the Atlantic Rainforest are under threat from occupation by poor migrants. See, e.g. *Favelas em expansão já cercam Parque de Tijuca* [Expanding shantytowns come close to Tijuca National Park], O GLOBO, Dec., 19, 2007, at 1.

³⁴ Roberto N. Méndez, *Viabilidad financiera de un tercer juego de esclusas*, 123 TAREAS 89, 90 (May-Aug. 2007).

³⁵ *Id.* at 90.

³⁶ *Id.* at 91.

³⁷ *Id.* “Multi-modal” refers, for example, to the receipt of a cargo ship in a port like Long Beach, California, that is then broken up into containers that are sent by rail or truck across the North American continent to the East Coast. See BLACK’S LAW DICTIONARY (8th ed. 2004)

decision to construct a third set of locks related to the efforts to turn reverted areas into protected—and biodiversity-protecting areas? It reveals the need to incorporate environmental considerations into planning for truly sustainable, long-term economic development. Yet this appears not to have happened.

Moreover, the example of the treatment of the reverted area that became Panama City's Metropolitan Park and, more generally, of government policies that put pressure on development of the untouched forests surrounding the Canal, does not bode well for future efforts to manage reverted areas. It therefore merits identifying some of the values served by maintaining preserved areas. Part of the solution for sound future management rests in public education regarding the value of establishing and maintaining protected areas.

b. Values Served by the Reverted Areas

If a country is poor or developing, it merits asking why areas should be protected from development. It is not unreasonable to wonder whether even short-term economic gains may be worth sacrificing the arguable luxury of protected ecosystems. More specifically, one must ask what exactly it means to have a "protected" area. A protected area is not necessarily one that is untouchable. It is one for which there exists a management plan that recognizes the ecosystem services that make the area deserving of protection, such as the rich biodiversity that characterizes much of Panama.

In Panama, this biodiversity deserves protection for various reasons, including possible scientific uses of its bio-

(defining "multimodal shipping" as "The transportation of freight using more means of carriage and using more than one carrier. For example, a cargo may be carried first by air or sea, then by rail or truck to its destination.").

riches in the future. It is conceivable that in the longer term the intellectual property (and specifically pharmaceutical) benefits of such areas could prove more powerful sources of income for a country like Panama than an invasion of condominium developments or agricultural uses in the reverted areas.³⁸ Panama also stands poised to develop protected areas for carefully managed tourism, as has happened in neighboring Costa Rica.³⁹

In addition, the tropical forests within protected areas like Panama's reverted areas also merit protection because of the essential ecosystem services they provide. These tropical forests typically serve as carbon sinks.⁴⁰ They are also important repositories of freshwater in areas where the surface water supplies may be inadequate.⁴¹ "The construction of highways in elevated reservoirs [i.e. tropi-

³⁸ See, e.g., John Copeland Nagle & J.B. Ruhl, *THE LAW OF BIODIVERSITY AND ECOSYSTEM MANAGEMENT*, 27-29 (2002) (discussing the countless benefits of biodiversity in the curing and prevention of diseases and contributions to human health).

³⁹ *Id.* at 29. (indicating that aesthetic value of beautiful animals and plants produce economic benefits by attracting ecotourism). On Costa Rican ecotourism, see, e.g., Katherine Lieberknecht, Jennifer Papazian and Andrea McQuay, *Balancing Conservation and Economics: The Development of an Ecotourism Plan for Panama*, in Ashton, O'Hara & Hauff, *supra* note 14, at 111-14.

⁴⁰ *Id.* See also, James Salzman, *Creating Markets for Ecosystem Services: Notes From the Field*, 80 N.Y.U. L. REV. 870, 872-73 (2005) (discussing the critical services provided by healthy ecosystems such as water purification).

⁴¹ See, e.g., Salzman, *supra* note 40, at 872. See also Salomón Aguilar, *Bosques de la Cuenca del Canal de Panamá*, in Heckadon-Moreno, *supra* note 1, at 91-97 ("Ubicados en la parte central y más angosta del Istmo, los bosques de la Cuenca del Canal contribuyen gracias a su ciclo de vida a producir agua para la vía interoceánica y para las plantas potabilizadores que abastecen de agua a las poblaciones de las ciudades de Panamá y Colón"). ("Located in the central and narrowest part of the isthmus, the Canal Watershed's forests contribute thanks to their life cycle to produce water for the interoceanic waterway and for the potabilizing plants that store water for the populations of Panama and Colón cities.").

cal forests that retain water] and land clearing that interferes with drainage and obstructs water movement can permanently interfere with biological cycles and the productivity of adjacent ecosystems.”⁴² In a country like Panama that is prone to flooding and has a low water table, forests serve the important function of protecting against the more extreme effects of flooding.⁴³ It should be emphasized that the importance of this water retention ecosystem service is both social and economic. Water is essential for Canal operations and the country has staked much of its future development on Canal expansion. Therefore, destruction of these forests for short-term interests like highway construction is foolhardy.

The forests within the reverted areas also serve as an important habitat for sustainable food species.⁴⁴ As noted above, protected areas also help preserve habitat and genetic diversity, which helps maintain healthy flora and fauna populations less susceptible than non-diverse gene pools to disease and depletion.⁴⁵

Development in protected areas, particularly in hot, humid tropical environments with a history of insect-borne infections like malaria, yellow fever and dengue, can also have negative consequences for human health: “[g]eneral operations for the construction of the third set of locks, roads and drainage canals, construction of encampments,

⁴² Manfredo, *supra* note 9, at 105.

⁴³ See James Salzman, Barton H. Thompson, Jr. & Gretchen C. Daily, *Protecting Ecosystem Services: Science, Economics, and Law*, 20 STAN. ENVTL. L.J. 309, 319 (2001) (indicating that heavy vegetation serves to prevent flooding by reducing peak flows, and discussing the relationship between watershed preservation and flood control).

⁴⁴ *Id.* at 323-25 (describing the significant impacts of deforestation in Costa Rica and Australia. For instance, due to deforestation, the loss of native tree cover in Australia has allowed naturally occurring salts in the soil to rise up to the surface and damage large areas of agricultural and grazing lands).

⁴⁵ See also Nagle & Ruhl, *supra* note 38; See generally, Manfredo, *supra* note 9.

along with other activities, has the potential to increase the breeding grounds of plagues or illness vectors” such as the malaria-and dengue-bearing mosquitoes.⁴⁶ An ecosystem service provided by a tropical forest can act as a damper to limit the proliferation of environments conducive to health-damaging pests.

This recognition of the benefits of ecosystem services derives from a perspective that aims to take into account the long-term sustainability of a growing society. As one Panamanian commentator has written, in a developing country like Panama, “it is fundamental . . . in terms of social security and access to adequate protection in front of labor risks, [to assure] an environment adequate to this end. Again, this is to prioritize in this case the right of the current and future population to enjoy an extensive and sufficient benefit of ecosystem services that maintain and permit the enjoyment of life. This is also here to recognize the intrinsic rights to nature and that of all living things.”⁴⁷

III. Legal and Regulatory Protections for the Reverted Areas

There are many models for protected and biodiversity protection areas at both the international and national levels. The remainder of this section will look at some of the more prominent examples, including regional models that could be easily adapted to the Panamanian reality.

a. Global Biodiversity and Protected Area Regulation

At a global level, there are numerous instruments designed to promote biodiversity protection. The best

⁴⁶ Manfredo, *supra* note 9, at 105.

⁴⁷ Juan Jované, *Hacia una estrategia alternativa de desarrollo*, TAR-EAS 78, May-Aug. 2007.

known of these is the U.N. Convention on Biological Diversity (“CBD”), which was signed and opened for ratification at the decennial U.N. Convention on Environment and Development, in Rio de Janeiro, in 1992.⁴⁸ The CBD creates an umbrella framework for biodiversity protection, including a requirement for research and training (Article 12), Technology Transfer (Article 18) and the creation of a Financial Mechanism to assist state parties in preservation activities.⁴⁹ The companion protocol, namely the Cartagena Protocol for Biosafety,⁵⁰ although more specifically designed to address issues such as genetically-modified organisms and their legal treatment, also has provisions to address capacity-building (Article 22), public awareness and participation (Article 23) and contains its own financial mechanism. All of these provisions might have the result of benefiting biodiversity and protected areas as well.⁵¹ Panama signed the CBD in June, 1992, and became a party in 1995 with ratification; it signed the Cartagena Protocol in 2001 and became a party with ratification in 2003.⁵²

The World Heritage Convention (“WHC”), adopted by the United Nations Education, Cultural and Scientific Organization in 1972, protects both “cultural and natural heritage around the world considered to be of outstanding

⁴⁸ Philippe Sands and Paolo Galizzi, DOCUMENTS IN INTERNATIONAL ENVIRONMENTAL LAW 691-92 (2004).

⁴⁹ The text of the Convention is available at <http://www.cbd.int/convention/convention.shtml> (last visited Apr. 13, 2008).

⁵⁰ The Cartagena Protocol was opened for signature on January 29, 2000. Background on the Cartagena Protocol available at <http://www.cbd.int/biosafety/background.shtml> (last visited Apr. 13, 2008).

⁵¹ The Text of the Protocol is available at <http://www.cbd.int/biosafety/protocol.shtml> (last visited on Apr. 13, 2008).

⁵² List of parties for both documents available at <http://www.cbd.int/convention/parties/list.shtml> (last visited Apr. 13, 2008).

value to humanity.”⁵³ Panama ratified its participation in the WHC in March, 1978.⁵⁴ The World Heritage List, a document issued pursuant to the WHC, contains five Panamanian sites, three of them natural sites (none of the natural sites are in the Panama City metropolitan area.)⁵⁵ Like the CBD, the WHC exists in part to encourage education and what is today called capacity-building to insure the preservation of listed sites.⁵⁶ However, despite efforts to argue that the WHC or other such international instruments could present a promising option to increase international biodiversity monitoring,⁵⁷ at present most commentators seem to agree that because this and similar international accords have no teeth and the pressures to develop many protected areas rich in biodiversity are now so powerful, these documents offer little in the way of guaranteed gains in biodiversity and protected areas conservation.⁵⁸ This work makes clear that there is no reason to think that they will effectively change behavior worldwide, except perhaps in individual cases.

One way in which international instruments have been hugely effective, however, is in shaping national legislation about biodiversity protection that is enforceable at the state level. The potential importance of this tool cannot be underestimated.

⁵³ About World Heritage, <http://whc.unesco.org/en/about/> (last visited Apr. 13, 2008).

⁵⁴ States Parties: Ratification Status, <http://whc.unesco.org/en/statesparties/> (last visited Apr. 13, 2008).

⁵⁵ See <http://whc.unesco.org/en/list> (last visited Apr. 13, 2008).

⁵⁶ See About World Heritage *supra* note 53.

⁵⁷ John Charles Kunich, *World Heritage in Danger in the Hotspots*, 78 IND. L.J. 619 (2003) (arguing that “[t]he World Heritage Convention could become an effective tool in the struggle to save the Earth's biodiversity, given the right concatenation of circumstances and decisions.”)

⁵⁸ See, e.g., Alexander Gillespie, *Threatened Areas of International Significance*, 22 N.Z.U. L. REV. 432 (2007) (survey of increasing biodiversity protection threats and failures of international instruments), Kunich, *supra* note 1.

b. Panamanian Law: Existing Instruments and Protections

Panama benefits from a number of legal protections that stand to serve the country. However, laws on paper are not enough; a significant portion of Panama's citizens and their allies need be mobilized to enforce Panamanian law, regulation and policy.

i. Constitutional Protections.

Like many countries in Latin America of relatively recent vintage, Panama's 1978 Constitution (amended in 1983, 1994 and 2004) contains a chapter dedicated to the environment. The chapter does more than merely guarantee as a "fundamental right that the population live in a clean environment free from contamination, in which the air, water and food satisfy the requirements for adequate development for human life," although it does that.⁵⁹ More importantly for the purposes of this paper, it also provides that "[t]he State and all of the inhabitants of the national territory have the right to enjoy social and economic development that prevents environmental contamination, maintains ecological equilibrium and avoids the destruction of ecosystems."⁶⁰ The other two articles in the chapter pro-

⁵⁹ Constitución Política de la República de Panamá, Ch. 7, Art.118. (*"Es deber fundamental del Estado garantizar que la población viva en un ambiente sano y libre de contaminación, en donde el aire, el agua y los alimentos satisfagan los requerimientos del desarrollo adecuado de la vida humana,"* available at the Political Database of the Americas, <http://pdba.georgetown.edu/Constitutions/Panama/constitucion2004.pdf> (last accessed October 11, 2008))

⁶⁰ *Id.* at Art. 119. "El Estado y todos los habitantes del territorio nacional tienen el deber de propiciar un desarrollo social y económico que

vide that the State shall assure access to environmental resources for all in such a way that avoids their destruction and sustainability⁶¹ and also requires that the law of non-renewable natural resources not create social, economic and environmental harms.⁶²

These are powerful tools if applied intelligently and deliberately to the resolution of particular conflicts. Among these conflicts is the proper treatment of the reverted areas. In the first instance, the guarantee to protect ecosystems would apply to the reverted areas since they constitute biodiversity “hotspots”⁶³ and would surely satisfy any definition of ecosystem. By this measure, the construction of the Northern Corridor Highway may have constituted a constitutional violation, providing the loss of habitat, wildlife and tree species alleged by Audubon and related groups could be established to a satisfactory level of legal proof. In short, this constitutional provision is the essential starting point for any protected areas or biodiversity protection action in Panama.

prevenga la contaminación del ambiente, mantenga el equilibrio ecológico y evite la destrucción de los ecosistemas.”

⁶¹ *Id.* at Art. 120. “El Estado reglamentará . . . las medidas necesarias para garantizar que la utilización y el aprovechamiento de la fauna terrestre, fluvial y marina, así como los bosques, tierras y aguas, se lleven a cabo racionalmente, de manera que se evite su depredación y se asegure su preservación, renovación y permanencia.”

⁶² *Id.* at Art. 121. La ley reglamentará el aprovechamiento de los recursos naturales no renovables, a fin de evitar que del mismo se deriven perjuicios sociales, económicos y ambientales.”

⁶³ See *Kunich*, *supra* note 1.

ii. National Environmental Laws

1. Law 23 of 2003: “Special Treatment Areas”

Law 23 of 2003 modified Law 21 of 1997, which had established a special development zone for the former Canal Zone. Law 23 is relevant for the reverted areas because it created “special treatment areas” for designated development within the former Canal Zone. This can include, for example, “urban and cultural resources areas” and “tourist and eco-tourist areas.” Although Law 23 is not specific about what these terms mean, it does at least identify them as worthy (if competing) values and provides for a procedure to seek such designations.⁶⁴ At a minimum, what this suggests is that the reverted areas might be usefully selected as meriting an eco-tourist designation, which could provide a usable framework for development that would preserve some of the ecosystem values of the reverted areas but also provide a bulwark against pressures to develop for other uses. The fact, however, that Law 79 provides the opportunity for special “urban” uses reflects how immediate this conflict is for Panama, although Law 21, which this law amends, includes “green urban areas” as one urban category.⁶⁵

⁶⁴ Law 79 of 2003, “CONCEPTO: El concepto de área de tratamiento especial sobrepuesto se aplicará en las áreas con usos del suelo regulados por esta Ley, que permite la flexibilidad del sistema para analizar oportunidades de desarrollo en áreas específicas del Plan Regional para el Desarrollo de la Región Interoceánica.”

⁶⁵ Law 21 of 1997, Annex I, Part II (Categorías de Ordenamiento Territorial).

2. Law 41 of 1998: Framework Legislation Including Provision for Protected Areas

Panama's framework national environmental policy also enumerates protection for protected areas. Law 48 of 1998, which also created the national environmental agency and requires national environmental planning and the preparation of environmental impact statements,⁶⁶ addresses protected areas and biodiversity protection in the context of a statutory title dedicated to natural resources protection and use. Although this is not uncommon—indeed, many U.S. states do exactly this—it is arguably unfortunate, because the commitments to protection are juxtaposed with provisions devoted to resource exploitation, creating an inherent conflict that is difficult to resolve. Thus, the natural resource chapter sets forth as its “objective the desire to incorporate the concept of sustainability and rationality in the enjoyment of natural resources, as well as to assure that environmental protection shall be a permanent component of the policy and administration of such resources.”⁶⁷ A desire to do something, of course, amounts to less than a guarantee that it will be done.

Nonetheless, Law 48 does create a National System of Protected Areas, which can exist on either public or private land.⁶⁸ Law 48 at least contemplates, whether through law, regulation or decree, the creation of such areas with a special emphasis on the use of economic incentives

⁶⁶ Titles III and IV of Law 48 of 1998.

⁶⁷ The original sentence reads in full: “Las normas sobre recursos naturales contenidas en la presente Ley, tienen el objetivo de incorporar el concepto de sostenibilidad y el de racionalidad en el aprovechamiento de los recursos naturales, así como asegurar que la protección del ambiente sea un componente permanente en la política y administración de tales recursos.” Law 48 of 1998, Tit. V, Ch. I, Art. 62.

⁶⁸ See Arts. 66 and 68 of Law 48.

and financial incentives to do so.⁶⁹ To be sure, the formal creation of such a system of protected areas is a step in the right direction. As intimated here, however, such a system would likely have greater integrity if, as in the Dominican and Brazilian examples discussed below, the law actually detailed the nature of the system and the areas it created. Ideally, it should do so not in a framework environmental protection law but in a freestanding law dedicated to protected areas only. As it is, Law 48 sandwiches protected areas between chapters dedicated to natural resource use and forest management; this arguably suggests a weak national commitment to special protected areas. In short, while Law 48 represents a useful foundational commitment to protected area creation, the law's special protected areas provision needs to be further detailed and elaborated with norms capable of being enforced.

3. Law 21 of 1997: Development Plan for Inter-Oceanic Region

Law 21 of 1997, which creates the authority to plan for the use, conservation and development of the Inter-Oceanic Area (the former Canal Zone), including the reverted areas, is something of a mixed bag for environmental protection. The initial paragraphs of Law 21 focus primarily on economic development, although this must be done "in accordance with principles of efficiency, equity and social justice."⁷⁰ Only in the final paragraph of the introductory section does Law 21 express a commitment to "sustainable development."⁷¹

On the other hand, Law 21 provides that the reverted areas shall be understood as public lands that may

⁶⁹ See, e.g., Arts. 68 and 71 of Law 48.

⁷⁰ Law 21 of 1997, ¶2.

⁷¹ Id. at ¶8.

not be appropriated for private use. This provides a legal basis for opposing the private concession that benefited from the construction of the Northern Corridor. That is, the concession should be scrutinized to ensure that it does not become a profit center for a private entity, which could constitute a misuse of this provision protecting public lands.

More importantly, Law 21 creates named “wild protected areas” that include the Metropolitan Park of Panama City—the particular reverted area of focus here. The section of Law 21 treating this and other “wild protected areas” specifically provides that the Metropolitan Park shall be preserved to provide more opportunities for the population to enjoy “open air” and opportunities for “guided recreation.”⁷² At the same time, Law 21 provides for the “demarcation of the servitudes necessary for the proposed routes as well as the corresponding [needs] for the necessary public services.”⁷³ Once again, Panamanian environmental law evidences a strong tension between a desire to develop reverted areas and recognition of the need to protect them.

In sum, while the Panamanian Constitution and some environmental laws contain provisions that could be used in support of claims favoring the protection of the reverted areas, they could be strengthened by yet more explicit protections. This lack of clarity has been a concern since the reversion of the Canal areas to Panama.⁷⁴ However, one need not look far within Latin America to identify strong legal examples that could usefully serve as models for Panama.

⁷² Law 21 of 1997, Annex I (Areas Silvestres Protegidas).

⁷³ *Id.*

⁷⁴ Whitney, *supra* note 8, at 104 (commenting that the ARI’s “plans lack specificity and clarity about how the natural protection efforts will be implemented and evaluated.”).

IV. Comparative Look: Locating Panamanian Protected Areas Legislation in a Regional Context

As a relatively small country, Panama might do well to look to the examples of laws and regulations implemented elsewhere in its region. The national examples below might serve the Panamanian nation well by virtue of the fact that they were drafted in light of environmental, social and economic conditions comparable to Panama's. In particular, each of the national laws described below were produced by nations rich in biodiversity, marked by extreme social and economic inequality and facing severe pressures of urbanization and agricultural development.

a. Brazil

Like Panama, Brazil is a country that is highly forested and possessed of rich biodiversity. Its National System of Conservation Units ("SNUC" is the Portuguese acronym for "Sistema Nacional das Unidades de Conservação") was enacted into law in 2000.⁷⁵ The law is a model of the form since it seeks to balance the widest possible range of human interventions into environmentally sensitive areas, including human intervention for economic development,⁷⁶ as Panamanian Law 21 apparently seeks to do⁷⁷. As such, SNUC provides a detailed scheme that would usefully serve Panama as it seeks to more precisely define in law the needs its environmental laws seek to balance.

⁷⁵ Lei No. 9,985 de 2000.

⁷⁶ SNUC's various categories are discussed in exhaustive detail in Colin Crawford and Guilherme Pignataro, *The Insistent (and Unrelenting) Challenges of Protecting Biodiversity in Brazil: Finding "the Law That Sticks,"* 39 U. MIAMI INTER-AM. L. REV 1 (2007).

⁷⁷ *Supra* notes 70-74.

b. Dominican Republic

The Dominican Republic, like many less-industrialized countries with a high incidence of biodiversity, enacted a comprehensive protected areas law that permits a wide range of uses. Enacted in 2000, this law permits some of the goals implied in Panama's environmental laws—namely human activity for economic development, but in a strictly controlled and highly regulated fashion.⁷⁸ The sort of detailed scheme in the Dominican law could easily be copied and adjusted to the specifics of Panamanian ecology and society. The great advantage is that it would provide a clear scheme that balances different demands but also clearly commits areas such as the Metropolitan Park, already designated for special protection,⁷⁹ to protection under detailed terms and specific requirements. For example, the Dominican framework law follows a schematic model first introduced by the International Union for the Conservation of Nature (“IUCN”), first in the late 1970s, and refined into the 1990s. The IUCN taxonomy

. . . identifies six possible categories of protected area, embracing a wide range of possible social, economic and cultural aspects. IUCN Category I affords the highest possible degree of protection for scientific research, and demands a minimum of human intervention. Category II refers to national parks, whether merited for environmental protection or for human use and enjoyment over time. Category II protects national monuments, and spe-

⁷⁸ Colin Crawford, *Protecting Environmentally-Sensitive Areas and Promoting Tourism in “The Back Patio of the United States”*: *Thoughts about Shared Responsibilities in Ecosystem and Biodiversity Protection*

25 UCLA J. ENVTL. L. & POL'Y. 41, 64-82 (2007) (discussing the Dominican framework law in detail).

⁷⁹ Interview, *supra* note 18.

cifically 'areas that may contain one or more natural, specific features that may have an outstanding or unique value, owing to their intrinsic rarity, their representative aesthetic qualities or cultural significance.' Category IV protects wildlife habitat.⁸⁰

The Dominican law further elaborates upon and adjusts these categories to the Dominican reality. The important point to stress here is that strong, comprehensive models exist that can easily and appropriately be adapted for use in Panama.

c. Colombia

Of course, having model statutes is only half the battle. As Brazilians say, it is also important to find the law that "sticks"⁸¹. This is possible only with vigorous enforcement. The continuing deforestation of the Brazilian Amazon demonstrates the challenges facing the effective application of its system of conservation units.⁸²

One regional model for serving the larger goals of protected area creation and maintenance in a country with a high rate of biodiversity can be identified in Colombia.⁸³ Like Panama, Colombia's environmental laws are not as highly articulated as those in some other South American or Caribbean countries like Brazil and the Dominican Republic. However, recent challenges in the Colombian

⁸⁰ No. 21, Gaceta Oficial, 2 July 1997.

⁸¹ See Crawford, *supra* note 78.

⁸² See, e.g., Leonardo Coutinho & Jose Edward, Reporte Especial, *Amazônia: A Verdade Sobre a Saúde da Floresta*, VEJA, Mar. 26, 2008, at 95, 101 (reporting an increase in deforestation of 30% "in recent months").

⁸³ INSTRUMENTOS ENCONOMICOS PARA LA GESTION AMBIENTAL EN COLOMBIA.

courts reveal the power of citizens to enforce what environmental laws exist—even with relatively small resources.

In August 2006, the Public Interest Law Group at the University of the Andes (“GDIP”, for “Grupo de Derecho de Interés Público”), in Bogotá, formed an alliance with an environmental group, the Interamerican Association for Environmental Defense (Asociación Interamericana para la Defensa del Ambiente). The groups subsequently brought a case in the Colombian Constitutional Court, alleging constitutional violations of the national forestry law.⁸⁴ Specifically, the non-profit groups insisted that the law be enforced to serve the goals of a clean environment and sustainable development. They were subsequently supported in their lawsuit by other civil society groups, notably those representing indigenous and Afro-Colombian populations. The lawsuit also had an environmental justice goal, namely the need to consult with indigenous and Afro-Colombian groups residing in the forests.⁸⁵ On January 23, 2008, the Constitutional Court

⁸⁴ Law 1021 Apr. 20, 2006, D.O. on Apr. 24. In the part that was eventually challenged as not being enforced constitutionally, Law 1021 provided that the actions to stop deforestation and the illegal cutting of forests, also as a way to promote the sustainable development of the forestry sector, should be adopted and executed in a joint and coordinated manner by the State, civil society and the productive sector, tending therein to assure equal access to resources and their integrated use, within a framework of the basic requirements for conservation of ecosystems and their diversity. (Las acciones para detener la deforestación y la tala ilegal de los bosques, así como para promover el desarrollo sostenible del sector forestal, deberán ser adoptadas y ejecutadas de manera conjunta y coordinada entre el Estado, la sociedad civil y el sector productivo, propendiéndose al acceso equitativo a los recursos y a su aprovechamiento integral, en el marco de los requerimientos básicos para la conservación de los ecosistemas y su diversidad biológica.)<http://www.lexbase.biz/lexbase/normas/leyes/2006/L1021de2006.html> (last visited Apr. 17, 2008).

⁸⁵ GDIP website, Summary on high impact litigation <http://gdip.uniandes.edu.co/contenido/litigio.html> (last visited Apr. 17, 2008).

declared Law 1021 of 2006—the Forestry Law—unconstitutional, in light of the “recognition of ethnic and cultural diversity as a constitutional and fundamental principle of Colombian nationality.” Moreover, the Court said that Colombia is by definition “a democratic, participatory and pluralistic State and it is established with finality that the state is to facilitate the participation of everyone in the decisions that affect them.”⁸⁶

Even for a relatively small nation like Panama, where civil society groups typically operate with limited funds, this Colombian example is promising since it provides a successful model—in a neighboring and historically connected country—of a constitutional challenge to a law affecting the environment that served socially and environmentally positive ends.⁸⁷ The Panamanian Constitution protects every citizen against ecosystem damage.⁸⁸ The Colombian example suggests just how effective a tool such a protection might be in the face of future challenges to develop reverted areas like the Northern Corridor project,⁸⁹ when linked to provisions like those creating “special treatment areas” under Panamanian Law 23 of 2003.⁹⁰

⁸⁶*Presidency of the Colombian Constitutional Court, COMUNICADO DE PRENSA No. 01 de 2008* (“reconocimiento de la diversidad étnica y cultural como principio constitucional y fundamento de la nacionalidad colombiana. . . . define a Colombia como un Estado democrático, participativo y pluralista. . . ., que establece como finalidad del estado la de facilitar la participación de todos en las decisiones que los afectan;”) (on file with author).

⁸⁷ See, e.g., Press Release, Lucia Lasso, Executive Director of the Alianza para la Conservación y Desarrollo (ACD), *Situación Actual del Proyecto Hidroeléctrico Chan-75: construcción avanza gracias a la fuerza policial y no al diálogo* (2008) (protesting at the lack of inclusion of affected indigenous communities in the construction of a major hydroelectric plant) (on file with author).

⁸⁸ See *Constitución Política de la República de Panamá*, Ch. 7, Art.119.

⁸⁹ See Interview, *supra* note 18 and accompanying text.

⁹⁰ See No. 21, *Gaceta Oficial*, 2 July 1997, *supra* note 80.

V. **Conclusion: Prospects for Preserving the Reverted Areas**

In sum, the above examples provide regional models for enhancing and strengthening Panama's legal mechanisms to defend the Metropolitan Park in Panama City and other reverted areas, and in the process to protect biodiversity. These examples come from countries that are similarly situated to Panama both with regard to the range and importance of their biodiversity and also with respect to many of their social and economic challenges. However, as the above example from Colombia suggests, it is not sufficient merely to have efficient laws on the books. It is also important to strengthen capacity in civil society to exploit available legal protections, as was imaginatively done by GDIP in Bogotá. The Study Space visit that gave rise to this paper suggests that this possibility exists in Panama.⁹¹ Furthermore, it is essential to educate the public within and outside Panama about the importance of preserving protected areas and biodiversity in the crossroads of the Americas. A Biodiversity Museum is a fine idea and may itself serve an important environmental educational role, but the real exhibits should be protected outside the walls of a fantastic Frank Gehry creation.

In closing, therefore, having noted the need to enhance and deepen the reach of Panamanian environmental laws, it merits iteration of justifications and strategies for assuring protection of the environmentally valuable reverted areas within Panama.

a. **Justifications**

⁹¹ See Lasso, *supra* note 87 (referring to the efforts of the Patronato del Parque Metropolitano and the non-profit ACD).

Two central justifications exist that support the argument to commence vigorous efforts to protect Panamanian reverted areas.

i. Ecosystem Services

As noted above, there are many values and functions served by ecosystems,⁹² In Panama, they serve both broader environmental health goals, such as genetic diversity, and shorter-term human health goals, such as protecting water quality. Thus, for example, in Panama this means providing the water supply essential to both urban residents and Canal operations and, thus, assuring the nation's economic stability in the future. In the case of Panama, in fact, an irony of the U.S. military occupation of the Canal Zone is that it left much of the surrounding forests, and their ecosystem services, largely intact. That is, however much suffering the U.S. occupation may have wrought, the presence of the colonial power resulted in an unexpected environmental bonus.⁹³ Consequently, before it is too late and these relatively pristine areas undergo further development for urban or agricultural use, there is an urgent need to recognize and seek to protect the potential economic benefits contained within the reverted areas. These benefits exist in the form of patentable products to be developed from rainforest plant and animal matter. As the examples of the laws of Brazil and the Dominican Republic demonstrate, well-crafted laws are an important starting point to help secure those goals. However, comprehensive laws

⁹² See Nagle, *supra* notes 38-40, Salzman, *supra* notes 40-41, Agvilar, *supra* note 41, Manfredó, *supra* note 42, Salzman, *supra* notes 43-44.

⁹³ Bruce A. Stein, Cameron Scott, & Nancy Benton, *Federal Lands and Endangered Species: The Role of Military and Other Federal Lands in Sustaining Biodiversity*, 54 BIOSCIENCE 339 (2008) (noting that a recent geographic survey of U.S. military lands noted the exceptionally high biodiversity on U.S. military lands).

detailing essential environmental values are not enough. The application of legal provisions must also be linked to a sustained commitment to the social and economic implications of environmental protection decisions for the entire society. Environmental justice principles provide an analytical framework to do so.

ii. Environmental Justice

Given Panama's history, it is essential to understand the creation and maintenance of protected areas and biodiversity protection as serving the broader interest of all segments of Panamanian society to truly assure "the adequate development of human life."⁹⁴ Equality of opportunity and quality of life have not been characteristic features of Panamanian history.⁹⁵ First, the Pacific coast proved more attractive to foreign powers, whether Spanish, French or North American. "Historically, the Spaniards left the wet forests and swamps of the Caribbean to the Indian and Black communities."⁹⁶ They preferred to settle, instead, in the "drier central highlands and the Pacific coast," thus creating an ethnically and racially heterogeneous mix.⁹⁷

⁹⁴ See Constitución Política de la República de Panamá, Ch. 7, Art.118. Available at the Political Database of the Americas, <http://pdba.georgetown.edu/Constitutions/Panama/constitucion2004.pdf> (last accessed October 11, 2008).

⁹⁵ See, e.g., Consejo Académico de la Universidad de Panamá, *Tareas sobre la marcha: Reflexión en torno de la coyuntura*, in 123 TAREAS, 122 (May-Aug. 2006) (describing modest gains for some economic sectors through education since beginning of Panamanian republic, now imperiled by global capitalism).

⁹⁶ Stanley Heckadon-Moreno, *Spanish Rule, Independence, and the Modern Colonization Frontiers*, in CENTRAL AMERICA: A NATURAL AND CULTURAL HISTORY 179 (Anthony G. Coates, ed. 1997).

⁹⁷ *Id.*

This mixture, however, was one characterized by great social and economic inequality that persists to this day.⁹⁸

In Panama, the historic inequality in the distribution of economic benefits and environmental burdens has been especially characteristic of the manipulation of the environment in and around the Canal. The Canal became reality with the obliteration of several towns submerged by the creation of Lake Gatún.⁹⁹ Early Canal workers suffered high rates of morbidity and mortality because of malaria and yellow fever.¹⁰⁰ With the eradication of yellow fever in 1905, workers came from around the world, although with distinctly different privileges. North Americans arrived to be paid in U.S. currency up to three times the salaries earned by other workers, while islands like Barbados supplied tens of thousands of mostly Afro-Caribbean workers to do the heavy lifting.¹⁰¹ These workers were housed in “deplorable” accommodations, poorly fed and badly paid:

In sum, the North Americans organized in the Canal Zone a society based on racial discrimination in an imitation of that which ruled in the southern United States. As a consequence, the services and the facilities of white Americans were prohibited to blacks, who remained mar-

⁹⁸ See, e.g., Benjamin Gardner, *Mutual Incomprehension or Selective Inattention? Creating Capacity for Public Participation in Natural Resource Management in Panama*, in Ashton, O’Hara and Hauff, *supra* note 14, at 137 (reporting extreme income stratification in Panama by early 1970s), CIA, *The World Factbook—Panama*, <https://www.cia.gov/library/publications/the-world-factbook/print/pm.html> (documenting that the highest 10% of household incomes have 35.7% of national wealth while lowest 10% have 1.2% of national wealth).

⁹⁹ Celestino Andrés Araúz, *Un sueño de siglos: el Canal de Panamá*, 123 TAREAS 5, 33 (May-Aug. 2006).

¹⁰⁰ *Id.* at 30.

¹⁰¹ *Id.*

ginalized from the activities and the life of the white men on the “gold roll.”¹⁰²

David McCullough, the Canal’s popular historian, estimated that there were 500 deaths per kilometer along the 80 kilometer Canal route.¹⁰³ Of these, during the period of North American control, it is estimated that of 5,609 deaths, 4,500 were of African descent. By contrast, only 350 white North Americans died.¹⁰⁴

This is a heavy toll and is appropriately classified as an environmental justice issue since it related to acts of great environmental consequence for all Panamanians, with disproportionate burdens suffered by the most vulnerable segments of the population.¹⁰⁵ This historical burden demands consideration of future manage of the environmental resources in and around the Canal. The long-term consequences of that history should be redressed by implementing environmental protection strategies benefitting all Panamanians. An added difficulty, however, is that for many years, Panamanian sovereignty was tied to acts that

¹⁰² *Id.* at 35 (“*En definitiva, los norteamericanos organizaron en la Zona del Canal una sociedad basada en la discriminación y la segregación raciales a imitación de lo que imperaba en el sur de los Estados Unidos. En consecuencia, los servicios e instalaciones de los blancos estadounidenses estaban vedados para los negros, que permanecían marginados de las actividades y de la vida de los hombres de gold roll.*”)

¹⁰³ See generally David McCullough, *PATH BETWEEN THE SEAS: THE CREATION OF THE PANAMA CANAL, 1870-1914* (1978).

¹⁰⁴ *Supra* Lasso note 87.

¹⁰⁵ See Principles of Environmental Justice, proceedings, *The First National People of Color Environmental Leadership Summit xiii* (Oct. 24-27, 1992), in Clifford Rechtschaffen & Eileen Gauna, ENVIRONMENTAL JUSTICE: LAW, POLICY & REGULATION 22-24 (2002) (for one early list defining environmental justice principles); See, e.g., THE LAW OF ENVIRONMENTAL JUSTICE: THEORIES AND PROCEDURES TO ADDRESS DISPROPORTIONATE RISKS (Sheila Foster & Michael B. Gerrard, eds. 2d. ed. 2008) (discussing environmental justice generally).

sought to control and manage the tropical forest, specifically through forest clearing and agrarian expansion.¹⁰⁶ Perhaps partly as a consequence, environmental protection strategies that would protect the forests are now often viewed by the poorest actors in the agrarian sector as strategies to keep them impoverished.¹⁰⁷

Yet as a former Panamanian official of the U.S.-controlled Panama Canal Commission, which preceded the Panamanian-controlled Panama Canal Authority, wrote about the use of the Panama-operated Canal: “[w]e must demand of those who, at present govern and make laws affecting us, that the funds coming from the operation of the Canal must be destined to projects that will better the condition of all Panamanians.”¹⁰⁸ The same must be said of the management of biodiversity conservation and preservation within the reverted areas. Just as the Canal provides direct economic resources to the Panamanian treasury in the form of transit fees that should be used for the benefit of all, so too the reverted areas should be recognized for the economic resource they are to Panama—resources that should be protected and used intelligently for the benefit of all Panamanian people.

b. Strategies and Possibilities

The question, then, is how best to assure the protection and sound management of the protected areas. That is, how should the discussion about use of ecosystem resources proceed? How can the organizing principle of

¹⁰⁶ Gardner, *supra* note 98, at 135.

¹⁰⁷ Heckadon-Moreno, *supra* note 96, at 212.

¹⁰⁸ Humberto R. Legnadier, *Retos al Canal de Panamá*, 123 TAREAS 55, 59 (May-Aug. 2006) (“*Debemos exigirles a los que, en el presente, nos gobiernan y legislan, que los fondos provenientes de la operación del Canal sean destinados a proyectos que mejoran la condición de todos los panameños*”).

environmental justice be secured? At least three strategies can be identified.

i. Education

Environmental education is of central importance. This principle has been articulated at the international level in instruments like the Convention on Biological Diversity¹⁰⁹ and, within Latin America, in instruments like the Brazilian¹¹⁰ and Colombian Constitutions.¹¹¹ Such provisions are an important step towards assuring protection of the reverted areas and other environmentally sensitive lands, but they are not enough. These provisions need to be fleshed out to include detailed education about the functions and values of ecosystems, so that the population understands that preserving protected areas is not merely a

¹⁰⁹ Convention on Biological Diversity, Art. 13, <http://www.cbd.int/convention/convention.shtml> (last visited Apr. 17, 2008).

¹¹⁰ Article 79 of the 1991 Constitution of the Republic of Colombia provides, in relevant part, that “[i]t is the obligation of the State to protect the diversity and integrity of the environment, to conserve areas of special ecological importance and support education for the achievement of these ends.” (*“Es deber del Estado proteger la diversidad e integridad del ambiente, conservar las áreas de especial importancia ecológica y fomentar la educación para el logro de estos fines.”*), available in the Political Database of the Americas of Georgetown University, <http://pdba.georgetown.edu/Constitutions/Colombia/col91.html> (last visited Apr. 17, 2008).

¹¹¹ Article 225 § VI of the 1988 Constitution of the Federative Republic of Brazil provides that all people have the right to “an environment in equilibrium,” achieved in part by “promoting environmental education at all levels of study and raising the consciousness of the public for the preservation of the environment.” (*“. . . promover a educação ambiental em todos os níveis de ensino e a conscientização pública para a preservação do meio ambiente”*), available at the Political Database of the Americas of Georgetown University, <http://pdba.georgetown.edu/Constitutions/Brazil/brazil05.html> (last visited Apr. 17, 2008).

matter of providing the relative luxury of an urban oasis for recreation.¹¹² Examples of environmental education in Panama exist that are both noteworthy and exciting in their potential for replication.¹¹³ The point is that there exists value in systematizing and institutionalizing these activities at the national level, and to begin to do so in Panama City, with the highest population concentration in the country and thus, arguably, the greatest immediate threat to biodiversity protection. However, this must be done by recognizing and taking into account the historical class and other social divisions of a “highly stratified society in which policy decisions are most responsive to values and demands articulated by its wealthy and politically powerful classes.”¹¹⁴ In short, there are considerable obstacles to overcome in achieving a situation where there is informed public participation based on mutual trust.¹¹⁵

ii. Public Participation

Broad-based public participation, following upon the heels of historically informed and socially aware environmental education is also essential. This will mean implementing a process that includes all stakeholders affected by a proposal in the process of deciding how a reverted area (or a particular resource existing within it) is to be

¹¹² See Nagle, *supra* notes 38-40, Salzman, *supra* notes 40-41, Agvilar, *supra* note 41, Manfredo, *supra* note 42, Salzman, *supra* notes 43-44.

¹¹³ See, e.g., Jorge Ventocilla & Valério Núñez, *Experiencias de educación ambiental en Kuna Yala*, in Heckadon-Moreno, *supra* note 1, at 228-32 (describing an environmental education project of the Smithsonian Tropical Research Institute in Caribbean coast indigenous settlement), Loyda E. Sánchez, Rosabel Miró, Rosa Montañez & Norita Scott-Pezet, CONSTRUYENDO UNA EXPERIENCIA PARTICIPATIVA DE CONSERVACIÓN 67-68 (2007) (describing one portion of a community participation program in monitoring for Panama Bay).

¹¹⁴ Gardner, *supra* note 98, at 137.

¹¹⁵ Maxwell & Williams, *supra* note 31, at 159 (describing difficulties in establishing community participation in Panama).

used. As shown elsewhere in this volume, that principle of public participation is not one that has always been widely supported in Panama.¹¹⁶ Such participation is an essential first step to insure that reverted areas are protected in a way that benefits all Panamanians. To guarantee long-term use beneficial to all, participation needs to be incorporated into an elaborated management scheme like those in the cited South American and Caribbean laws described above. The process of participation needs, furthermore, to incorporate education about the economic and environmental value of protected areas.

In this, the discipline of ecological economics could prove of vital use to Panama. As the ecological economists explain, the discipline is a “transdisciplinary way of looking at the world . . . essential if we are to achieve the three interdependent goals of ecological economics,” namely “sustainable scale, fair distribution, and efficient allocation.”¹¹⁷ In other words, sophisticated metrics exist both to value and defend the creation of protected areas and biological diversity. The use of such metrics will make it possible to avoid the suggestion that the environment is a luxury available only to the rich. They can also be applied to help explain to a population that environmental protection of spaces like the reverted areas is a necessity for all.

The remaining question is how to link these goal—that is, how to tie the effort to secure broad public participation to a deeply informed, inter-disciplinary analytical framework for understanding environmental problems. One possibility would be a participatory technique comparable to the participatory budgeting used in southern Brazil and copied elsewhere.¹¹⁸ The idea is simple: to establish an

¹¹⁶ Gonzalez, *supra* note 11, at 321-33.

¹¹⁷ Robert Costanza, John Cumberland, Herman Daly, Robert Goodland & Richard Norgaard, *AN INTRODUCTION TO ECOLOGICAL ECONOMICS* 79 (St. Lucie Press 1997).

¹¹⁸ See, e.g. Boaventura de Sousa Santos, *Participatory Budgeting in Porto Alegre: Toward a Redistributive Democracy*, in Boaventura

organized system of social administration that gives communities at small, manageable levels the power to participate in the articulation and implementation of strategies to address the social challenges they face. A central feature of such participatory budgeting is to assure such grassroots participation at the outset of the decision making process, so that local decisions actually contribute to the final actions taken by larger units of social organization—whether cities, states or national governments. In this way, the participation is truly democratic. Such a model could be used, similarly, for participatory ecosystem management.

iii. Financial Support

As a small country with limited financial resources, Panama cannot do this alone. Therefore, financial assistance is crucial. One means to provide assistance is through international legal mechanisms. Indeed, one would be hard pressed to find a more compelling example demanding United States participation in the CBD than Panama. As the principal creator and beneficiary of the area's principal economic resource for over the last hundred years, the U.S. bears a continuing financial obligation to help protect the biological integrity and sound ecosystem management of the reverted areas it once controlled. In fact, shortly before the end of the U.S. colonial presence, the need to protect the reverted areas and other parts of the Panama Canal watershed was recognized by the U.S. Congress in considering appropriations for Fiscal Year 1999.¹¹⁹ Such financial support should be continued as both an ex-

Sousa Santos, *DEMOCRATIZING DEMOCRACY: BEYOND THE LIBERAL DEMOCRATIC CANON* 305-276 (Verso 2005).

¹¹⁹ United States Agency for International Development, U.S. CONGRESSIONAL PRESENTATION: PANAMA (1999) (discussing proposed Congressional appropriations and "short-term" commitment to preserving reverted areas prior to Canal reversion), available at <http://www.usaid.gov/pubs/cp99/lac/pa.htm> (last visited Feb. 10, 2008).

pression of U.S. interest in sound environmental management and economic growth policies that respect the biological integrity of the geographical region in which we live. The problem is that direct financial assistance rarely comes without conditions that benefit the donor. Given the long and tortured history of the two nations, one dominated by the stark power and economic imbalances between them, direct financial aid could likely impose conditions unacceptable to 21st century Panamanians.

Adoption of the CBD would thus help protect biodiversity hotspots like Panama without the complications of bilateral assistance agreements.¹²⁰ Of course, funds would not specifically go from the U.S. to Panama. However, given Panama's richness in biodiversity, it would surely be an indirect beneficiary of U.S. participation in the CBD. In addition, U.S. membership in the CBD would affirm to Panama and its citizens the recognition by an important and respected ally of the importance of protecting Panama's greatest environmental assets.

Another option that would involve more direct investment in protecting reverted areas is a model already used by the two nations. As noted, given the extended colonial relation between the U.S. and Panama, any direct investment need be accepted with caution by virtue of the continued and future control they imply. Importantly, however, a recent example of such investment appears to have been structured in such a way as to reduce the possibility for the imposition of conditions benefitting the donor only. In July 2007, the Panamanian Environmental Authority (Autoridad Nacional del Ambiente, or ANAM) and the U.S. Agency for International Development (U.S. AID) announced the creation of "a fund to finance biodiversity conservation programs in the watershed of the Panama

¹²⁰ See Convention on Biological Diversity, *supra* note 111, Art. 20, 21 (detailing the financial responsibilities and mechanisms created by the Convention).

Canal.”¹²¹ Initially funded with \$ 2.4 million to focus “sustainable development and poverty reduction” programs in several national parks and their watersheds, on its face this fund at least represents a promising, if modest, beginning.¹²² A key aspect of this funding is that it is administered by the private non-profit Natura Foundation (*Fundación Natura*). This is important in that such independent management can help insure that decisions benefiting Panama are, in the end, made by Panamanians. It should be noted, however, that the fund is not focused specifically on the reverted areas.¹²³ Nonetheless, the model offers evidence of a strategy linking environmental protection and economic development in the broadest sense for the benefit of all Panamanians.

Furthermore, and, again given the long, complex and unequal relationship between the two countries, it is important that any such assistance not only be administered by non-profit, local recipients, but also that any conditions linked to the administration of such aid be imposed to benefit all Panamanians. Specifically, such aid should be given contingent upon a Panamanian commitment to environmental justice. Domestically, the United States government committed itself to environmental justice as a federal responsibility with the 1993 signature by President Bill Clinton of Executive Order 12,898.¹²⁴ When there is direct U.S. assistance for protection of biodiversity in Panama and

¹²¹ See ANAM, Press Release, available at <http://www.anam.gob.pa/notas%20de%20prensa/julio2007.htm> (last visited Feb. 11, 2008).

¹²² *Id.*

¹²³ See Fundación Natura Panamá, *Fondo para la Conservación y Recuperación de la Cuenca Hidrográfica del Canal de Panamá*, available at http://www.naturapanama.org/index.php?option=com_content&task=view&id=6&Itemid=10 (last visited Apr. 17, 2008).

¹²⁴ See, e.g., Bradford C. Mank, *Executive Order 12,898*, in Foster & Gerrard, *supra* note 105, at 103-07.

other countries, a similar requirement could be imposed. In this way, the U.S. can assure that it does not again help the Panamanian elite perpetuate the inequalities that it both tolerated and benefitted from for so long.

To be sure, there is a place for bilateral cooperation of the type that has long existed in and benefitted Panama. Most prominently, the Smithsonian Tropical Research Institute in Panama has since 1923 conducted extensive and important biological diversity work there.¹²⁵ In addition, smaller institutions like the Missouri Botanical Garden played a central role in the early decades of the last century in documenting and thus seeking protection of the nation's biological riches.¹²⁶ The above emphasis on local Panamanian control is not meant to suggest that such U.S. and other foreign-based institutions should not continue to play valuable research roles in protecting biodiversity in Panama's reverted areas and elsewhere in the isthmus. The point, on the contrary, is that these institutional examples are admirable precedents of cooperation that worked and continues to work on behalf of Panama in ways that both respect its sovereignty and also seek to protect its environmental resources.

As the prominent Panamanian rural sociologist Stanley Heckadon-Moreno has noted, environmental consciousness is on the rise in Panama and throughout Central America. With it, people are "demanding greater account-

¹²⁵ See Smithsonian Tropical Research Institute, *About STRI*, available at http://www.stri.org/english/about_stri/index.php (last visited Apr. 18, 2008).

¹²⁶ See, e.g., Stanley Heckadon-Moreno, *Exploraciones botánicas de Robert Woodson en Panamá (1935 y 1938)*, in SELVAS ENTRE DOS MARES 280-96 (2006) (documenting the role of the Missouri Botanical Garden).

ability of governments and private enterprises.”¹²⁷ This is reflected in the fight of the Panamanian-led chapter of the local Audubon Society against the Northern Corridor and its consequences.¹²⁸ The development of national parks throughout the region, beginning in the 1970s, has experienced growing pains but nonetheless shows signs of increasing sophistication.¹²⁹ In brief, in Central America, “[t]he new model must seek harmony between man and nature through the substantial conservation and appropriate exploitation of biodiversity.”¹³⁰ Panama’s reverted areas—and notably the Metropolitan Park – are an ideal opportunity to put that commitment to the test. A Frank Gehry-designed Biodiversity Museum could thus become merely the portal through which to enter, begin to understand and appreciate Panamanian biodiversity. Exhibits in the real museum, income generating and environmental-health protecting tropical forests rich in ecosystem services, could then be visited and used responsibly for generations to come.

¹²⁷ Heckadon-Moreno, *supra* note 96, at 213.

¹²⁸ See *supra* notes 18-22 and accompanying text.

¹²⁹ Heckadon-Moreno, *supra* note 96, at 213-14.

¹³⁰ *Id.* at 214. In the particular Panamanian context, these challenges are discussed in a paper written on the eve of the transfer of the Canal properties by Eileen Petzold-Bradley, *Panama’s Non-Traditional Security Concerns: Approaching the 21st Century* (1997), available at <http://bibliotecavirtual.clacso.org.ar/ar/libros/lasa97/petzoldbradl.pdf> (last visited Apr. 16, 2008).

