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Article 1

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Exploring How Today's Development Affects Future Generations Around the Globe

In This Issue: Sustainable Pathways Toward Biodiversity Preservation

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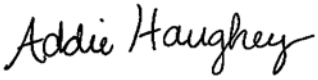
American University Washington College of Law

Editors' Note

Variety is not just the spice of life; it is its backbone. The United Nations declared 2010 to be the International Year of Biodiversity, and along with the 2010 Biodiversity Target, this year is set to highlight the importance of the world's flora and fauna to the fundamental functioning of the global ecosystem. This added attention to biodiversity issues, including the rapid increase in the rate of its loss, which is precisely what the 2010 Biodiversity Target is seeking to address, reveals that we may be experiencing the Earth's sixth great extinction. Biological diversity, or the variability among living organisms, helps to provide food for human civilization, protects against the spread of disease, and offers innumerable opportunities for scientific study and casual enjoyment. Humanity is both a part of this great diversity and the single largest cause of its rapid loss. With disastrous events such as the recent oil spill in the Gulf of Mexico fresh in the minds of the American public, it is clear that biodiversity is under siege.

In this issue of Sustainable Development Law & Policy, our authors will discuss several international instruments that seek to preserve biodiversity, including the Convention on Biological Diversity and the Convention on International Trade in Endangered Species of Wild Fauna and Flora. Another author will analyze the threat of endocrine-disrupting chemicals to the United States' wildlife and suggests that the Clean Water Act is a possible regulatory solution to this problem. The introduction of this issue offers some of the root causes of biodiversity loss and puts forward novel, science-based solutions. Our student features present some lesser known threats to biodiversity loss, including the impacts that controlled and wild fires have on forest management, the potential loss of agricultural biodiversity due to the Food and Drug Administration's approval of cloned livestock, and the potential impact that new sources of renewable energy could have on various species.

We hope that this issue advances the dialogue between practitioners, policymakers, and the scientific community, by presenting unique solutions to problems that will inevitably affect all life on Earth. This issue looks beyond the charismatic mega-fauna, such as the polar bear or the tiger, that have become important symbols of biodiversity preservation and the environmental movement itself, and delves into the heart of biodiversity loss. The state of the world's biodiversity is undeniably bleak. We hope that this issue serves as a complementary note in the essential clarion call to action.



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Features:

Introduction: A Perspective on Sustainable Pathways Toward Preservation of Biodiversity

*by Vicki Breazeale, Ph.D.**

"Look deep into nature, and then you will understand everything better."—Albert Einstein

The Problem: Loss of Biodiversity

Biodiversity describes the vast variety of all species of life on Earth. Ecosystems are where species live, and the health, size, and nature of intact ecosystems directly affect their biodiversity. The structure, complexity, inhabitant species, organism interactions, and fragility of ecosystems vary. Tropical rainforests, for example, are the most complex and diverse ecosystems on earth, and more than half of all species live in tropical forests.

Biodiversity has steadily increased on Earth since life began some 3.2 billion years ago, but now it is on a precipitous decline due to human activity. The biologically diverse ecosystems on earth constitute our life support system—they are responsible for our atmosphere, our clean water, our medicines, and the food we eat. If ecosystems collapse and biodiversity continues to decline at the current rate, humans will be at great risk.

There are many ways to describe the accelerating loss of biodiversity on earth and the difficulty humans have in grasping the depth of the problem. The most rapid changes in biodiversity in history have occurred in only the last 50 years. The major human created threats to ecosystem health and biodiversity are:

1. invasive species that out-compete and cause extinction of native species,
2. climate change due to increased carbon dioxide in the atmosphere,
3. habitat[1] change or destruction,
4. over exploitation of ecosystems such as removing top carnivores or over-fishing of oceans, and
5. nutrient loading and pollution from nitrogen and phosphorous fertilizer.

According to the International Union for the Conservation of Nature ("IUCN"):

> Loss of biodiversity - the variety of animals, plants, their habitats and their genes–on which so much of human life depends, is one of the world's most pressing crises. It is estimated that the current species extinction rate is between 1,000 and 10,000 times higher than it would naturally be. The main drivers of this loss are converting natural areas to farming and urban development, introducing invasive alien species, polluting or over-exploiting resources including water and soils and harvesting wild plants and animals at unsustainable levels.[2]

The Ecological Footprint has been calculated globally on the basis of United Nations statistics and other well-established data. It shows the ratio between humanity's demand and the Earth's productive capacity, or biocapacity (the ability of the flora, fauna, water and atmosphere to sustain the balance of life on Earth), in each year, and how this ratio has changed over time. Humanity has moved from using, in net terms, about half the planet's biocapacity in 1961 to 1.2 times the biocapacity of the Earth in 2001. The global demand for resources thus exceeds the biological capacity of the Earth to renew these resources by some 20%—in other words, it takes the biosphere one year and nearly three months to renew what humanity uses in one year. This "ecological deficit" or "overshoot" means ecosystem assets are being liquidated and wastes are accumulating in the biosphere, and the potential for future biocapacity is reduced. Overshoot is possible because, for example, forests can be cut faster than they grow, fish can be harvested faster than their natural replacement rate, water can be withdrawn faster than aquifers are replenished, and carbon dioxide ("CO_2") emitted faster than it is sequestered. We must stop cutting down our forest and earnestly support global reforestation efforts.[3]

Humans need to better understand the nature of the elegant organismal interactions that sustain life on Earth, including their own—we need to realize we are an integral and powerful part of nature. But, it seems that humans and their institutions don't see themselves as part of ecosystems. Perhaps this is because we move from one ecosystem to another so easily and quickly, and we manipulate the natural world so effortlessly and profoundly. In fact, we have the single greatest effect of any species on the health and welfare of ecosystems on Earth and we have executed our influence on Earth's biodiversity with devastating effects.

From the tundra of Alaska, to the desert in Death Valley, to the Choco-Manabi Bioregion in Ecuador, every species has a job to do, and they take their work very seriously. Bees, for example, pollinate most of the plants that provide food for humans and terrestrial animals, which makes the current Honey Bee Colony Collapse Disorder very troubling. There is currently a widely disseminated view that if the bees disappear from the surface of the earth, humans would have no more than four to five years to live.

In another poignant example, recent field research of John Terborgh at Duke University shows that ecosystem integrity is often dependent on the functional presence of large carnivores. And yet we are losing top carnivores at an alarming rate in

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oceans and on land. Humans, acting as "ultra carnivores," are solely responsible for these losses. The kind of predation that we engage in is not ecologically sustainable and results in ecological imbalance of the highest order.

The Earth's oceans, which cover 71% of the surface of the Earth, may be the most threatened ecosystems of all. We are over-fishing our oceans, driving many species of fish to extinction and disrupting complex ocean food chains. There are large masses of plastic in the Pacific, Atlantic, and Indian Oceans. Beaches all over the world are covered with plastic trash, medical waste, and fishing nets. Run-off into the oceans, especially from industrialized nations, is polluted with pesticides, herbicides, fertilizers, pharmaceutical wastes, and other pathogens that are creating large dead-zones in the oceans.

Given this ecological context, many questions arise: Where on Earth are the large, intact ecosystems that need urgent attention? What must we do to restore the health of our oceans? What legal and policy tools can promote solutions to biodiversity loss?

The Solution: Sustaining Biodiversity

The global path to sustainable perpetuation of biodiversity must involve as many people, institutions, businesses, and governments as possible. As Albert Einstein put it "Our task must be to free ourselves by widening our circle of compassion to embrace all living creatures and the whole of nature and its beauty." Fortunately, there are dedicated, intelligent people working on the problem all over the world. Below are a few examples of progress.

In December 2009, the 190 nations that are party to the UN Framework Convention on Climate Change ("UNFCCC") met in Copenhagen, Denmark. Part of the meeting dealt with Reduced Emissions from Deforestation and Degradation, or REDD, which is a program that would compensate countries that possess large forests if they reduce their rates of deforestation. Reducing deforestation reduces carbon emissions, and carries the added benefit of maintaining and enhancing the health of large intact ecosystems and the biodiversity they contain. The details of exactly how to implement REDD have not been carefully elaborated and "the devil is in the detail," but great potential exists to protect biodiversity through REDD.

The United Nations declared 2010 to be the International Year of Biodiversity. It is a celebration of life on earth and of the value of biodiversity for our lives, as well as a unique opportunity to increase understanding of the vital role that biodiversity plays in sustaining life on Earth. The world is invited to take action in 2010 to safeguard the variety of life on earth. The UN declares that:

> You are an integral part of nature; your fate is tightly linked with biodiversity, the huge variety of other animals and plants, the places they live and their surrounding environments, all over the world. This is vital for current and future human well being. We need to do more. Now is the time to act. You rely on this diversity of life to provide you with the food, fuel, medicine and other essentials you simply cannot live without. Yet this rich diversity is being lost at a greatly accelerated rate because of human activities. This impoverishes us all and weakens the ability of the living systems, on which we depend, to resist growing threats such as climate change.[4]

The GLOBIO consortium is a collaboration between the Netherlands Environmental Assessment Agency ("PBL"), UNEP GRID-Arendal, and UNEP-World Conservation Monitoring Centre ("UNEP-WCMC"). The consortium started in 2003. The main output of the consortium is the GLOBIO modeling framework, with the aim to support integrated global assessments and to calculate the impact of five environmental drivers on land biodiversity for the past, present, and future. The five drivers are: land cover change, land-use intensity, fragmentation of ecosystems, atmospheric nitrogen deposition and infrastructure development. This is a powerful, science-based tool that will help researchers, institutions, and governments around the world in their efforts to monitor the global state of ecosystems and biodiversity.[5]

The Center for Conservation Biology at Stanford was established by Paul Ehrlich in the Department of Biological Sciences in 1984, and is one example of an academic institution tackling the challenge of biodiversity.[6] Gretchen Daily, Director of the Center, is an ecologist and a conservation heroine with the admirable goal of developing a scientific basis—and political and institutional support—for managing Earth's life support systems. Her recent book, *The New Economy of Nature*, written with Katherine Ellison, a Pulitzer-prize winning journalist, is an informative and engaging examination of what they call the "new economy," an economy that recognizes the economic value of natural systems and the profits in protecting them. Daily describes her work as:

> …developing the field of countryside biogeography to forecast changes in biodiversity and ecosystem services in human-dominated landscapes, using both theoretical and empirical approaches, including remote sensing. I am also developing a scientific framework for characterizing ecosystem services and incorporating their value into decision-making. Finally, to investigate new conservation finance mechanisms and policy options, I am collaborating extensively with economists, legal scholars, mathematicians, and leaders of non-government organizations and in the public and private sectors.[7]

Even with these examples of progress, there is much more that can be done. It would be wise, for example, for governments to educationally empower young people all over the world to become actively involved in preservation of biodiversity. I propose offering high school and college student's government paid sabbaticals from school to do conservation work in biologically critical ecosystems. It would certainly be a life-changing educational experience.

Concluding Remarks: A Call to Action

It is fair to say that there is a lot of "bad news" about the environment, and that how humans respond to these challenges will define us as a species. Our unique ability to communicate abiotically via language and symbols comes with the responsibility to make choices as individuals and members of society that do not diminish the ability of the planet to renew itself. Prior to global industrialization there was a balance that has been altered unsustainably by the demands of an ever-increasing human population.

Now, during the International Year of Biodiversity, it is more important than ever that biodiversity be put at the forefront, and discussed widely by all kinds of people, from government officials, to conservation professionals, to academics, to average citizens. The time for action is now. This issue of Sustainable Development Law & Policy provides a forum for such discussion.

Endnotes: Introduction: A Perspective on Sustainable Pathways toward Preservation of Biodiversity

[1] A habitat is the unique space and time occupied by a particular species in an ecosystem.

[2] Int'l Union for Conservation of Nature, Biodiversity, http://www.iucn.org/what/tpas/biodiversity/ (last visited May 3, 2010).

[3] GreenFacts.org, *Scientific Facts on Biodiversity*, http://www.greenfacts.org/en/global-biodiversity-outlook/index.htm#6 (last visited May 5, 2010).

[4] UN Convention on Biological Diversity, Messages, http://www.cbd.int/2010/messages/ (last visited May 3, 2010).

[5] Globio, Home, http://www.globio.info/ (last visited May 3, 2010).

[6] Center for Conservation Biology, http://www.stanford.edu/group/CCB/About%20CCB.html (last visited May 3, 2010).

[7] Center for Conservation Biology, Gretchen Daily, http://www.stanford.edu/group/CCB/Staff/gretchen.htm (last visited May 3, 2010).

About SDLP

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Joining the Convention on Biological Diversity:

A Legal and Scientific Overview of Why the United States Must Wake Up

*by William J. Snape, III**

Introduction and Summary

Life on Earth as we know it is under siege. Significant and probably irreversible changes to the natural world are now occurring. It is an undisputed fact that we are losing wild species in nature to extinction faster than in any geologic period since the dinosaur die-off roughly sixty five million years ago. It is also undisputed that ecosystem services from land, water, and air are degraded throughout the world and threatening food supplies, economic development, scientific advancements, and global security. The rapid advent of global warming and associated climate change makes the job of saving native plants, animals, and habitats even more difficult. Human beings need biological diversity to survive and prosper, but our natural support system is fraying.

Enter the Convention on Biological Diversity, sometimes called the "CBD" for short. The United States has signed but not yet ratified this international treaty, which has emerged as the best overarching tool to protect species, habitats, and ecological processes important to human well-being. It has a seventeen-year track record building numerous success stories with its over 190 members; only Andorra, the Holy See (Vatican), and the United States remain as non-members.

Now more than ever, the engagement and leadership of the United States is necessary to protect biological diversity and the natural services enjoyed by Americans and others throughout the world. No country possesses an inventory, description, and understanding of its wildlife, habitat networks, and ecological processes greater than the United States. In addition, the U.S. possesses transparent laws, dispenses significant foreign aid, and embodies a tradition of public engagement that leads to greater biodiversity-related protection and enforcement than most countries. The U.S. has also been a good international partner in other environmental agreements and treaties such as the Convention on International Trade in Endangered Species ("CITES"), the Ramsar Convention on Wetlands, and the Montreal Protocol on Substances that Deplete the Ozone Layer. The interests of the United States stand to benefit greatly from such multilateral cooperation and continued ability to access biological diversity from other countries across the globe.

Now more than ever, the engagement and leadership of the United States is necessary to protect biological diversity.

Significantly, no new federal or state laws are necessary for the United States to ratify and join the CBD, and absolutely no loss of legal or natural resource sovereignty is even possible under the express terms of the Convention. The United States will, in fact, benefit under the treaty by better organizing its own biodiversity-related programs, and by similarly helping non-U.S. geographic areas, many in strategically important locations. The United States will also benefit by possessing a formal seat at the table for important upcoming negotiations and discussions under the Convention, particularly with regard to the proposed protocol on Access and Benefit-sharing ("ABS"), and by being connected to other Parties through various biodiversity-related projects such as scientific research, climate offsets, ocean protection, alien invasive species work, and enforcement coordination. Many worldwide biodiversity cooperative programs flow from the Convention, including partnerships with other U.N. agreements and the World Trade Organization.

Consistent with the plain language of the treaty's text, which clearly supports U.S. Government discretion in all actions CBD-related, U.S. interests have also been protected by the so-called "Seven Understandings" and other official interpretations and clarifications developed with overwhelming bipartisan support in response to U.S. industry concerns in the early to mid 1990s. Indeed, the Convention's implementation has been influenced by the U.S. Government interpretations. These interpretations represent a firm way of moving forward in international biodiversity matters.

Younger and future generations of American and global citizens will thank the President and Senate that finally enables the United States to take its rightful place as a member of the Convention on Biological Diversity. There is no longer any rational basis for the U.S. to stand apart from the world with regard to the treaty that is known as the convention for life on Earth. The Senate should ratify this convention at the earliest possible moment, along with other high priorities including the Law of the Sea

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Convention ("UNCLOS") and the International Treaty on Plant Genetic Resources ("ITPGR").

Understanding the Convention on Biological Diversity

What is at Stake for Humanity and the Natural World

The Convention on Biological Diversity[1] defines biological diversity as "the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species and ecosystems."[2] As revealed by its linguistic roots, the term "biological diversity" (or "biodiversity") describes the variety of life on our planet. It includes literally all of the millions of animals, plants, fungi, lichens, and microorganisms. It includes the evolutionary variation of life, built up over the several billion years of the planet's existence—at the genetic, species, and ecosystem levels. And, it includes the stunning diversity of species and natural processes with and between many different ecological regions. In sum, biodiversity is all life on earth.[3]

. . . economists have estimated multiple trillions *of dollars worth of benefits from a healthy balance of biodiversity.*

The planet is currently losing biological diversity at a rate not seen since the mass species die off that claimed the dinosaurs in the Cretaceous geologic period sixty-five million years ago.[4] The loss of biological diversity, including the approximately 1.9 million existing known and identified species as part of the roughly 15 million estimated number of all total existing species,[5] can be lumped into three main, overarching causes: habitat loss and degradation; intentional take and related forms of trade or commerce; and various forms of pollution (e.g., dirty water, toxics, invasive species, greenhouse pollutants).

Aside from the many inherent, personal, and spiritual reasons to save nature, economists have estimated multiple *trillions* of dollars worth of benefits from a healthy balance of biodiversity: clean air and water, productive soils and wetlands, bio-commerce, recreation, eco-tourism, health costs and insurance savings.[6] The biodiversity crisis, already acute before the manifestations of global warming,[7] is now accelerating because massive amounts of greenhouse pollutants in the planet's atmosphere could "drive the climate system" to "tragic consequences" that are completely "out of our control."[8] Some of our current "needs" of fossil fuel energy, corporate agriculture, mass-manufacturing, urban development, suburban sprawl, and traditional transportation are ironically threatening our very survival. Biodiversity-rich oceans, forests, and other ecosystems could be a major part of the climate change solution.[9]

There is scientific consensus about the staggering decline of natural capital lost over the past century.[10] The Millennium Ecosystem Assessment ("MEA") may be the most comprehensive assessment of the Earth's ecosystems to date. The MEA was prepared by 1,360 experts from 95 countries (including a large contingent from the United States), and functioned as a broad partnership of international organizations, academics, scientists, non-profit groups, and private foundations.[11]

The central finding of the Millennium Ecosystem Assessment is that "(o)ver the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing demands for food, fresh water, timber, fiber and fuel . . . [and the] degradation of ecosystem services could grow significantly worse during the first half of this century."[12] Specific examples from the MEA report are highly illuminating albeit sobering: more land was converted to cropland between 1950 and 1980 than between 1700 to 1850; withdrawals from rivers and lakes have doubled since 1960 (as has water use in general) and is expected to grow significantly; 60% of atmospheric carbon dioxide pollution since 1750 has taken place since 1960; world human population doubled from 3 to 6 billion people from 1960 to 2000; wood harvests for pulp and paper have more than tripled since 1960; at least one-quarter of all commercially exploitable fish stocks are clearly over-harvested.[13]

The Assessment concludes there must be "significant changes in policies, institutions and practices that are not currently under way."[14] Approximately 60% of the ecosystem services evaluated" in the MEA "are being degraded or used unsustainably." The degradation of ecosystem services often causes significant harm to human well-being and represents a loss of natural assets or wealth of a country.[15] Disease, malnutrition, famine, poverty, and unrest will all result under almost all models without change. Reinvigorated implementation of the CBD, with the partnership and leadership of the United States, would be a constructive change of course.[16]

Even before the current understanding on the threats caused by global warming, the loss of habitat and species were already understood as a major threat to mankind.[17] Now, with the impacts of global warming already beginning, the full throttle of potential calamity becomes clear.[18] Consider this conclusion from the U.S. Department of Defense, Air Command Staff of the Maxwell Air Force Base in Alabama: "The emergence of harmful nonlinear, long-term, cumulative, anthropogenically generated changes to the Earth's climate and natural environment pose a 'serious threat to America's national security.'"[19]

This security risk involves more than the disturbing prospect of massive sea level rise and large parts of coastal America disappearing[20] and more than the continued pressure by refugees to breach our borders.[21] Take, for instance, the melting Himalayan glaciers and the changes wrought by dwindling water supplies for areas in China and India (i.e., Ganges, Yellow and Yangtze Rivers) as well as Afghanistan and Pakistan (i.e., Hindu Kush mountain region with 140 million rural residents including many susceptible to hostility toward the United States).[22] That these glaciers may not totally melt by 2035, as originally hypothesized by some scientists, means we still have time.[23] But without action, including adaptation guided by the CBD, it is no exaggeration to say that major natural upheavals and suffering will occur all over: from the Arctic and subarctic regions to Africa and the Americas.

Today, there is reason to believe that the odds of significant natural resource degradation leading to deadly human unrest throughout the world are quite high.[24] And it is not just environmental advocates who are calling the alarm. It is the military. It is the scientific establishment. It is the insurance and investment industries. Natural resource degradation, global food insecurity, and climate change are a volatile stew. The CBD is a stabilizing blueprint toward remedying many of these problems.[25]

The Convention Itself: Providing Framework, Not Prescription

The Convention on Biological Diversity was adopted on May 22, 1992 and entered into force on December 29, 1993. The U.S. signed the treaty on June 4, 1993. The CBD was the result of a decade's worth of diplomatic effort, originally led by the United States, which included several different U.S. administrations from both political parties. The preamble of the Convention is premised upon "the intrinsic value of biological diversity and of the ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values of biological diversity and its components . . . (and) also of the importance of biological diversity for evolution and for maintaining life sustaining systems in the biosphere." The CBD further affirms "that the conservation of biological diversity is a common concern of humankind," is "(c)oncerned that biological diversity is being significantly reduced by certain human activities," and is "(d)etermined to conserve and sustainably use biological diversity for the benefit of present and future generations."[26]

The objectives of the Convention are three-fold: (1) the *conservation of biological diversity* (e.g., Articles 6-9, 11, and 14); (2) the *sustainable use* of its components (e.g., Articles 6, 10, and 14); and (3) the *fair and equitable sharing of the benefits* arising from the use of biological and genetic resources (e.g., Articles 14, 15, 16, and 19-21).[27] Thus, "conservation" of biological diversity, the "sustainable use" of its components and the "fair and equitable sharing of the benefits," together form the heart or basic agreement of the Convention. The central concept of "sustainable use," which also governs much of the U.S. public land system, is defined under the CBD as "the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations."[28] The CBD seeks to have parties integrate conservation and sustainable use into its decision-making, to avoid and minimize adverse impacts to biological diversity, and utilize customary and local efforts as appropriate.[29]

Perhaps the most fundamental point about the CBD is that its legal power is inherently limited by design. The Convention's clear enunciation of national control over domestic biological resources is the starting point:

> States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own natural resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or areas beyond the limits of national jurisdiction.[30]

As a matter of interpretation, the CBD authorizes much but mandates little. Terms such as "as far as possible and as appropriate" are scattered throughout the treaty. However, the convention's conservation provisions and programs prompt countries such as the U.S. to focus on the "big picture" by connecting policies and funds in a manner that benefits all. Consequently, the CBD is considered more of a "framework" convention because it, *inter alia*, does not set many precise obligations.[31] As one scholar puts it, "a framework convention sets the tone, establishes certain principles and even enunciates certain commitments … As a rule, it does not contain specific obligations … nor does it contain a detailed prescription of certain activities."[32] Contrary to the rhetoric of some extreme ideologues who seemingly oppose involvement in any multilateral cooperative endeavor, the CBD creates a global structure that is implemented with wide latitude and discretion at the national level, specifically allows for negotiation (or rejection) of annexes or protocols, does not mandate binding dispute settlement and provides connection with other accepted international agreements. This concept of "framework" in conjunction with the precise language of the treaty is crucial in understanding the full sovereignty the United States retains when it becomes a party to the Convention on Biological Diversity.[33]

Conservation Under the Convention

Much of the conservation agenda of the Convention is contained in Articles 6, 8, and 14.[34] These articles and others cover the gamut of biodiversity conservation including tasks the CBD already does well: fostering coordination in addressing harmful invasive species, implementing a global strategy for plant conservation; providing support for vital scientific discipline of taxonomy; catalyzing large-scale protected area protection; and linking with important global warming and climate change efforts.[35] Every U.S. governmental analysis of the Convention's conservation provisions has concluded that existing U.S. laws already meet the commitments of the Convention.

Article 6 of the CBD, *General Measures for Conservation and Sustainable Use*, requests that "Each Contracting Party shall, in accordance with its particular conditions and capabilities: a) Develop national strategies, plans or programmes[36] for the conservation and sustainable use of biological diversity or adapt for this purpose existing strategies, plans or programmes which shall reflect . . . [such] measures . . .; and b) Integrate as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies." Although the U.S. currently does not possess a "biodiversity plan" *per se*, its impressive array of conservation statutes and programs to protect and use biological resources of all sorts certainly could be considered to constitute one *de facto*.[37] If anything, the CBD should help the U.S. coordinate and prioritize its biodiversity agenda even better.

Inherent in this system of federal protection is the important role that state governments play in the protection of biological diversity under the U.S. Constitution, as well as a variety of relevant natural resource statute and programs. States possess primary responsibility for fish, wildlife, habitat, and other "biodiversity" trusteeship duties (e.g., water rights) not otherwise covered by valid federal authority.[38] States also possess explicit authority under U.S. pollution statutes such as the Clean Air Act and Clean Water Act.[39] Because of this reality, state authorities, powers, and priorities would absolutely not be altered by the CBD unless the state voluntarily and willingly chose to do so. Same as with the national level of biodiversity-related programs, the states possess a rich tapestry of current, popular, and effective biodiversity programs.[40]

Article 8 of the Convention, *In-Situ Conservation*, is where the plans in Article 6 actually take root. It is also where the most comprehensive list of conservation commitments is explained. While it is clear that the list of measures to be considered under Article 8 conservation is long, it is equally clear that most measures are largely hortatory and/or plainly covered by existing U.S. laws or programs, which are quite well-developed and enough to center its entire Article 8 program, from "a" to "m."

First and foremost, the U.S. has established "a system of protected areas and or areas where special measures need to be taken" under Article 8(a).[41] Integrally related to this natural system, the United States has developed and now manages "for the conservation of biological resources" pursuant to Article 8 (b)-(c) through various federal and state statutes relating wildlife, plants, fish, forests, wetlands, coasts, lakes, rivers, water, endangered species, rangelands, parks, refuges, and other public lands. The U.S. "promotes" the protection of domestic and foreign ecosystems, natural habitats and the maintenance of viable populations of species and "recovery plans" under CBD Articles 8(d), 8(f), 8(k), and 8(m).[42]

The U.S. similarly "promotes" environmentally sound and sustainable development "in areas adjacent to protected areas" under CBD Article 8(e) through statutes such as the Endangered Species Act (e.g., habitat conservation plans under Section 10), Coastal Zone Management Act state-federal plans, the Clean Water Act's wetland program, and the Bureau of Land Management's Areas of Critical Environmental Concern ("ACEC") program, among others. The United States' philosophy on municipal, industrial, and hazardous waste is also consistent with CBD Article 8(e).[43] The U.S. has established "means" to regulate or control risk associated with living modified organisms under CBD Article 8(g) through several statutes.[44] The U.S. possesses authority to "prevent" the introduction of alien species under Article 8(h) through statutes such as the Federal Noxious Weed Act and the Nonindigenous Aquatic Nuisance Prevention and Control Act.[45] The U.S. "endeavors" under CBD Article 8(i) to provide conditions for present uses and conservation of biological diversity through all of its public land laws,[46] the Endangered Species Act, and countless state/local zoning ordinances.

The U.S. also already possesses—under its legal system of endangered species, public land, pollution, and environmental assessment laws—"processes" designed precisely to oversee predicted adverse impacts to biological diversity (under CBD Article 8(l)).[47] The U.S. legal system also, based on both its trustee role for Indian tribes as well as its respect for tribal sovereignty, possesses a rich legal fabric of respect for and maintenance under CBD Article 8(j) of Native American "knowledge, innovations and practices … relevant for the conservation and sustainable use of biological diversity."[48] Pertinent to CBD Articles 8(m) and 22, the U.S. already actively participates in a number of multilateral initiatives to conserve, protect, use, and share biological diversity.[49] All these conventions, treaties, agreements, declarations, and funding actions[50] have proven constructive, some significantly so, to U.S. foreign and environmental policy across party lines over the past half-century.

Understanding and minimizing site-specific impacts to biodiversity is laid out in Article 14(a)-(b) of the CBD which, *inter alia*, states: "Each Contracting Party, as far as possible and as appropriate, shall … Introduce appropriate procedures requiring environmental impact assessment of its proposed projects that are likely to have significant adverse effects on biological diversity with a view to avoiding or minimizing such effects and, where appropriate, allow for public participation in such procedures … ensure that the environmental consequences … are duly taken into account."[51] This request, which the United States already implements through environmental review procedures under the National Environmental Policy Act ("NEPA"), the grandparent of U.S. environmental law,[52] which generally mandates that "every federal agency action" "significantly" "affecting" "the quality of the human environment"[53] be accompanied with an "environmental impact statement" that includes "adverse environmental effects which cannot be avoided," a reasonable number of "alternatives," and "any irreversible and irretrievable commitments or resources." Multilaterally, the United States regularly analyzes the environmental impacts of its commercial and other actions, even when the biodiversity at issue is outside the country.[54]

In fact, it could be argued that U.S. general adherence to NEPA and related environmental review laws is what already

places the country in a leadership position with regard to biodiversity conservation. Signed by President Richard Nixon, NEPA seeks "to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man."[55] These environmental impact statements shall "recognize the worldwide and long-range character of environmental problems and, where consistent with the foreign policy of the United States, lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of mankind's world environment." They should also "initiate and utilize ecological information useful in restoring, maintaining, and enhancing the quality of the environment."[56]

Applicable Council on Environmental Quality ("CEQ") regulations make NEPA rules "binding on all Federal agencies" and as "a supplement to its existing authority and as a mandate to view traditional policies and missions in the light of the Act's national environmental objectives." Each "agency of the Federal Government shall comply with that section unless existing law applicable to the agency's operations expressly prohibits or makes compliance impossible.[57] The epitome of a "look before you leap" mandate, NEPA has been held to apply to a long list of federal actions with impacts upon biodiversity for some time now,[58] and long-standing triggers on whether an action will "significantly affect the environment" include proximity to park lands, prime farmlands, wetlands, wild and scenic rivers, ecologically critical areas, historic or cultural resources, and the degree to which the action may adversely affect an endangered or threatened species or its habitat.[59]

Because of its demand for accurate technical information, NEPA is often at the center of cutting edge environmental issues, such as those revolving around biodiversity loss and climate change.[60] And because of its positive procedural impact, NEPA (and all other open government laws such as the U.S. Freedom of Information Act[61]) is a model for CBD Article 10 Sustainable Use, Article 14 Impact Assessment, Article 17 Exchange of Information, and Article 18 Technical and Scientific Cooperation. In the U.S., this is particularly true for protecting federal public lands across jurisdictions (including lands and waters adjacent to Canada and Mexico), actions with federal permit approval (e.g., pollution, wetlands, species take), or any other major federal agency action.[62]

Equity Under the Convention

Article 14 is a bridge provision of sorts in the CBD because it links the three objectives of the Convention with basic information needs.[63] Not only does Article 14 contemplate the examination of environmental impacts of many different types of actions, but it also acknowledges the existence of "adverse" actions and seeks to "minimize" them.[64] Information empowers the general public, in rich and poor countries alike, and in regions with different levels of biological diversity. The central "exchange" of the CBD is to provide money-poorer and biodiverse-rich countries (and their entities) with income while providing cash-rich but biodiverse-poorer countries (and their entities) with access to the benefits of biodiversity.

Information is also at root of the Convention's "Access" articles: Article 15 (Access to Genetic Resources) and Article 16 (Access to and Transfer of Technology), both of which institutionalize an incentive to conserve biological diversity in developing and developed countries alike. A careful read of these two articles reveals a similarity to the conservation provisions under CBD Article 8, namely the establishment of a *framework* for reciprocal access and an abundance of *qualifying* phrases ("as appropriate" or "shall endeavor") that reinforce the ultimate freedom to contract, which Articles 15 and 16 authorize and encourage. In other words, the CBD encourages access to genetic resources but only on "mutually agreed terms."[65] The principle of "prior informed consent," is similarly prominent in this portion of the treaty.[66] "In many respects, U.S. scientists and genetic resource specialists welcome the central and clarifying role the CBD plays with regard to genetic resources . . . many scientists stress that the more consultative way of collecting samples preceded the CBD, and that those scientists and institutions that pay attention to the needs of other nations do best in securing biological research."[67]

The "equity" provisions of the CBD are noteworthy for the balance struck in the text language.[68] Although parties retain the final say over their own genetic resources, each party "shall endeavor to create conditions to facilitate access" to those resources consistent with "the objectives of this Convention."[69] Similarly, under Article 16, transfer of technology shall be provided under "fair and most favourable terms" (for developing countries) but shall be consistent with "intellectual property rights" (for developed countries).[70] Each "Party shall take . . . policy measures, as appropriate, to provide for the effective participation in biotechnological research activities by those Contracting Parties, especially developing countries, which provide the genetic resources for such research."[71] And developed country Parties shall provide new and additional financial resources to enable developing country Parties to meet the agreed incremental costs[72] to them.[73] The CBD's Bonn Guidelines (Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization) flesh out the meaning of these treaty articles in a constructive and generally agreed upon way.[74]

Relatedly, the Food and Agriculture Organization's ("FAO") International Treaty on Plant Genetic Resources ("ITPGR"), which the U.S. signed under President George W. Bush and which the Obama administration now seeks to ratify, supports the "conservation and sustainable use of plant genetic resources" and explicitly describes "harmony with the Convention on Biological Diversity" as one of its primary objectives.[75] The ITPGR's successful ABS provisions on the sustainable use of genetic resources for certain food crops is a significant diplomatic break-through.[76] This equity model has been created by the U.S. and the rest of the world. It works, particularly because of its model standard material transfer agreement on ABS based upon a consensual multilateral bank of genetic resources.[77] It is

a foundation of success from which the U.S. and the CBD can continue to build upon.

U.S. History and Interests with the CBD

Leadership by Example

It was the United States who championed the idea of a Biodiversity Treaty in the 1980s, and was influential in getting the effort off the ground in the early 1990s. Formal negotiations of the Convention began in February 1991 with the goal of completing negotiations in time for the United Nations Conference on Environment and Development in June 1992.[78] Beginning with the first Conference of Parties ("COP") in 1994, the United States has sent a delegation of "observers" to CBD meetings of all kinds, including the most recent Conference of the Parties (COP 9 in Germany), providing necessary and constructive advice on the work programs of the Convention. Many countries still recognize the substantial contributions the United States has made to global conservation over the past century.

Today, the United States is essentially the last holdout to the CBD. This is a major abdication of American leadership and expertise in biodiversity matters. While there have been some success stories, overall biodiversity[79] has continued to decline worldwide. These struggles exist despite the laudable 2010 CBD biodiversity targets, which will not be met.[80] Now is an apt time for the United States to chart an intelligent course based on what has been learned[81] and built.[82]

U.S. Ratification Progress in the 1990s

Previous history on the U.S. CBD ratification effort is important in understanding the current political and legal dynamics. When President Clinton and his administration transmitted the Convention to the U.S. Senate, after extensive consultations with all interested parties, he did so with "Seven Understandings" that accompanied the eventual bipartisan 16-3 positive vote out of the Foreign Relations Committee in 1994.[83] Clinton stated: "Biological diversity conservation in the United States is addressed through a tightly woven partnership of Federal, State, and private sector programs in management of our lands and waters and their resident and migratory species. There are hundreds of state and federal laws and programs and an extensive system of Federal and State wildlife refuges, marine sanctuaries, wildlife management areas, recreation areas, parks, and forests. These existing programs and authorities are considered sufficient to enable any activities necessary to effectively implement our responsibilities under the Convention. The Administration does not intend to disrupt the existing balance of Federal and State authorities through this Convention." In addition, in August 1994, the U.S. State Department engaged in eleven written CBD question/answers with a block of Senate Republicans that has also become part of the treaty's ratification history.[84] The Senate ratification process thereafter stalled.

The Seven Understandings and Eleven Answers

These collective understandings, interpretations, and clarifications are a crucial part of any eventual U.S. implementing package, and possessed wide bipartisan and interest group support when drafted. The treaty's main legislative history, addressed and explained in order of the Senate's Seven CBD Understandings below, also draws upon the Eleven Republican Questions and Answers, as well the Memorandum of Record ("MOR") submitted by the Secretaries of Interior, Agriculture, and State.[85]

1) *The Government of the United States of America understands that Article 3 references a principle to be taken into account in the implementation of the Convention.*

Article 3 of the Convention reaffirms that countries such as the United States possess the sovereign right to use their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction." This First Understanding makes clear that the principle of non-harm, well accepted in international law, must be understood "in the specific context within the Convention."[86]

2) *It is the understanding of the Government of the United States of America with respect to provisions addressing access to and transfers of technology that: a) "fair and most favorable terms" in Article 16(2) means terms that are voluntarily agreed to by all parties to the transaction; b) with respect to technology subject to patents and other intellectual property rights, Parties must ensure that any access to or transfer of technology that occurs recognizes and is consistent with the adequate and effective protection of intellectual property rights, and that Article 16(5) does not alter this obligation.*

Article 16 of the Convention, entitled "Access to and Transfer of Technology," is one of the central provisions of the treaty, noteworthy for its purposeful give and take. The United States' understandings here make clear the Government's stance on the basic primacy of contract and respect of legally protected property rights within the purposes of the Convention.[87] This Second Understanding is related to the next (number Three).

3) *It is the understanding of the Government of the United States of America with respect to provisions addressing the conduct and location of research based on genetic resources that: a) Article 15(6) applies only to scientific research conducted by a Party, while Article 19(1) addresses measures taken by Parties regarding scientific measures conducted by either public or private entities; b) Article 19(1) cannot serve as a basis for any Party to unilaterally change the terms of existing agreements involving public or private U.S.entities.*

Article 15 of the Convention governs "Access to Genetic Resources" and is generally ruled by "prior informed consent of the Contracting Party providing such resources."[88] CBD Article 19(1) governs policy measures for the effective participation in biotechnological research activities by developing countries, and this understanding makes clear that pre-existing agreements are not changed by that article. In addition, the United States'

signature to the International Treaty on Plant Genetic Resources for Food and Agriculture ("ITPGR") is "in harmony with the Convention on Biological Diversity."[89] The ITPGR compliments and supplements the CBD by reducing the transaction costs of ensuring fair and equitable benefit sharing for those crops included in the ITPGR's multilateral system.

Together, the intellectual property provisos in Understandings Two and Three are significant, resolving a central concern of the influential biotech industry in the United States.[90] In actuality, the "biotechnology" industry is many industries premised upon using nature's components and human ingenuity to make items of higher value. A "recombinant DNA technique" of altering species has proven to be particularly lucrative over the past several decades. Since the early 1990s, there has been an explosion of applications for biotechnology and biomimicry in medicine, pharmacology, agriculture, criminal justice, industrial products, toxic clean up, and consumer goods. There are thousands of such private businesses now, worth at least hundreds of billions of dollars.[91]

Many American businesses possess a tangible interest in how the Convention is implemented and have been strong supporters of the ratification.[92] Now, with over fifteen years of experience under its belt, the COP to the Convention would like to complete the negotiations of an international regime on ABS by October 2010 at the next COP in Japan.[93] The United States needs to be a formal part of this important multilateral dialogue, both in developing the CBD ABS policy and then implementing it. The powerful World Trade Organization ("WTO") has constructively entered this dialogue by instructing the WTO TRIPS Council to examine "the relationship between the TRIPS Agreement and the Convention on Biological Diversity, the protection of traditional knowledge and folklore, and other relevant new developments raised by members."[94] The World Intellectual Property Organization ("WIPO") is also engaged in reconciling the relationship between biotechnological research activities and the CBD.

Many American businesses possess a tangible interest in how the Convention is implemented and have been strong supporters of the ratification.

4) *It is the understanding of the Government of the United States of America that, with respect to Article 20(2), the financial resources provided by developed country Parties are to enable developing country Parties to meet the agreed full incremental costs to them of implementing measures that fulfill the obligations of the Convention and to benefit from its provisions and that are agreed between a developing country Party and the institutional structure referred to in Article 21.*

Because Article 20(2) of the Convention provides for "new and additional financial resources to enable developing country Parties to meet the agreed full incremental costs to them," this U.S. understanding limits the committed U.S. financial resources to "agreed" costs and "agreed" payments by the GEF under Article 21 of the Convention. The Senate has asserted that this arrangement is a financial "safeguard" for the United States.[95]

5) *It is the understanding of the Government of the United States of America that, with respect to Article 21(1), the "authority" of the Conference of the Parties with respect to the financial mechanism relates to determining, for purposes of the Convention, the policy, strategy, program priorities and eligibility criteria relating to the access to and utilization of such resources.*

This understanding makes it clear that the Convention itself does not dictate the amount of such financial resources to be made available. The GEF allows countries such as the United States to better control financial resources it contributes. In other words, the U.S. has protection from a majority of CBD members mandating certain funding levels because the Convention recommends funding for program priorities but the GEF approves and provides that funding.[96]

6) *The Government of the United States of America understands that the decision to be taken by the Conference of the Parties under Article 21, Paragraph 1, concerns "the amount of resources needed" by the financial mechanism, and that nothing in Article 20 or 21 authorizes the Conference of the Parties to take decisions concerning the amount, nature, frequency or size of the contributions of the Parties to the institutional structure.*

This provision further protects, clarifies, and secures U.S. funding under this treaty consistent with the two previous understandings. The GEF and U.S. participation in it secures these American financial interests.

7) *The Government of the United States of America understands that although the provisions of this Convention do not apply to any warship, naval auxiliary, or other vessels or aircraft owned or operated by a State and used, for the time being, only on government non-commercial service, each State shall ensure, by the adoption of appropriate measures not impairing operations or operational capabilities of such vessels or aircraft owned by it, that such vessels or aircraft act in a manner consistent, as far as is reasonable and practicable, with this Convention.*

Although the "provisions of this Convention shall not affect the rights and obligations of any Contracting Party deriving from any existing international agreement," Article 22(1), the United States "will make every effort to ensure that U.S. sovereign immune vessels and aircraft meet the standards of the Convention."[97]

The Benefits of U.S. Ratification and of Full Membership in the CBD

Global Security by Engagement

Thus, the CBD has catalyzed significant natural resource conservation, while also establishing itself as a valuable partner for diverse stakeholders all over the planet. A number of U.S. interests—national security, environmental, scientific, biotech industry, farming and food supply, religious, educational, Native American—would benefit from CBD ratification and have called for international engagement by the U.S. in these matters.[98] Perhaps the greatest immediate challenge is to prioritize the CBD within the context of a busy U.S. Senate schedule including the UNCLOS[99] and climate/energy considerations.

There is no doubt that the CBD should be a crucial part of the global environmental agenda for President Obama and his administration, and would help constructive U.S. multilateral outreach on such diverse issues as international security, poverty alleviation, and economic opportunity. Even the Bush II Administration, which was perceived by many as skeptical toward environmental protection, made positive statements about the CBD. At the Sixth COP in 2002, a high-ranking U.S. State Department official proclaimed:

> The United States recognizes the importance of the Convention on Biological Diversity (CBD) as a valuable forum for international discussions on issues related to biological diversity. We appreciate the opportunity to participate … as we have in previous CBD deliberations, with the aim of furthering our shared goals related to biological diversity … The United States is committed to the objectives of the Convention, both at home and abroad. This commitment is reflected in the vibrant, ever-growing range of public and private sector programs and activities occurring throughout the United States related to protecting and sustainably using biological resources. The United States remains equally committed to assisting partner countries in their efforts to protect biodiversity through bilateral assistance, through its contributions to regional and international organizations and financial institutions, through innovative debt reduction programs such as the Tropical Forest Conservation Act, and through a broad range of other benefit-sharing programs. In particular, we are pleased to be one of the largest contributors to the Global Environmental Facility (GEF)…[100]

At no point has any U.S. administration taken a significantly different view of the U.S. relationship with the CBD, and there continues to be strong interest by the U.S. Government in work plans on forests, marine and coastal areas, invasive alien species, Caribbean (and other eco-region) conservation, pollinators, food security,[101] and other Convention initiatives.

Failure to engage will mean closed doors on access to genetic resources for U.S. companies and continuing market conflicts over U.S. biotech exports.

Achieving Strategic U.S. Ecological and Economic Goals

More is to be learned about species, natural systems, and the full economic benefits of biological diversity. The CBD's three underlying purposes—conservation, sustainable use, and equity—are three principles that the U.S. Government supported even before the CBD was written. Time has not changed the conclusion for the United States that "Senate advice and consent would help complete the significant efforts and sound principles undertaken on a bipartisan basis by this and the previous Administration. Having addressed the appropriate and legitimate concerns raised in the past, it is now in the economic interests of the United States to ratify this agreement."[102] Further, it is today even better understood that biodiversity threats are literally economic threats.[103]

Full U.S. engagement could be determinative for the ongoing ABS negotiations with regard to genetic and biological resources under the CBD and other related multilateral instruments. This area is another example of the inextricable relationship between economics and ecology. Five studies, "which are central elements of the negotiations," were requested by the CBD Secretariat at the last COP on ABS:[104] (1) Recent developments in methods to identify genetic resources directly based on DNA sequences; (2) Identification of the different possible ways of tracking and monitoring genetic resources through the use of persistent global unique identifiers, including the practicality, feasibility, costs, and benefits of the different options; (3) How an international understanding on ABS could be in harmony and be mutually supportive of the mandates of and coexist alongside other international instruments and forums that govern the use of genetic resources; (4) Development of a comparative study of the real and transactional costs involved in the process of access to justice across jurisdictions; and (5) How can compliance be

ensured in conformity with Indigenous Peoples and local communities customary law, national law, across jurisdictions, and international law, including human rights and trade.[105]

These are issues for which the United States simply must not be on the CBD sidelines because the United States has great interest in continued biological access. The United States is already engaged in current and productive CBD-related discussions at the FAO, WTO and WIPO on intellectual property rights and biological resources. A three-legged chair is ultimately unstable. The CBD brings a fourth and vital perspective in the overall debate, building upon the ongoing use of the non-binding but influential Bonn Guidelines.[106] As one genetic researcher has noted, "We need communication between different communities of folks—research talking to government—in order to solve the problems we face."[107] Failure to engage will mean closed doors on access to genetic resources for U.S. companies and continuing market conflicts over U.S. biotech exports. Failure to engage means lack of full U.S. Government participation in the domestic and global conservation challenges for which it has tremendous expertise.

Outstanding Legal Issues

Based on the preceding analysis, fully engaging and joining the CBD raises three main issues for U.S. biodiversity diplomacy:

First, what will actually be negotiated on ABS at COP 10 in Japan in October 2010, and what will be the follow-up in 2011 and afterwards?[108]

Second, how will global warming, associated climate change, and ocean acidification impact the CBD's future agenda?

Third, how will the CBD continue to intersect with other closely aligned treaties and multilateral entities including the ITPGR, UNCLOS, CITES, and the World Trade Organization?

Accepted Principles

Despite the real challenges faced by the global community in stemming the environmental crises leading to biodiversity loss, climate change and ocean degradation, certain legal principles, and scientific facts have emerged over the past fifteen years:

1. The CBD is a framework convention. It provides the foundation for consensual action by parties, but does not dictate any particular results. This structure has successfully allowed the CBD to provide a template by which to solve real world problems while accommodating national circumstances.
2. The United States is already in full accordance with the substantive terms of the CBD, which provide discretion and flexibility based upon national circumstances. No new legislation at either the federal or state level is necessary for the United States to ratify and implement the CBD immediately, and future legislative and administrative amendments would not be precluded.
3. Sovereignty is fully retained by the United State on all issues, with no exceptions. Again, because of the terms and nature of the CBD, there is no plausible current scenario where the United States, the states, or any citizen would be forced to take an action or refrain from an action because of the treaty itself. The CBD does not authorize any legal causes of action in U.S. federal or state courts.[109] In addition, to the extent the United States was to have a dispute with another nation-state party under CBD Article 27, the United States need only submit to negotiation and, if that fails, non-binding conciliation.
4. The United States needs a formal seat at the table for the ongoing ABS "negotiations" at the Convention on Biological Diversity, as well as issues pertaining to biodiversity conservation and sustainable development.[110] Even if an ABS agreement is reached in 2010 or thereafter, the United States will have tremendous interest in implementing any agreement at all available fora, particularly as it relates to "prior informed consent" and "mutually agreed terms." The United States will also want to ensure that the new CBD rules on ABS are consistent with the FAO rules the U.S. recently helped create under the ITGPR, and negotiations at both the WTO and WIPO.
5. Addressing global warming is a monumental global development issue and environmental crisis that needs U.S. leadership. Climate change impacts biodiversity and is itself impacted by biodiversity.[111] Many important global security issues now flow from the CBD, including ways in which healthy forests, oceans and other ecosystems help stabilize the planet's health and climate. The CBD provides unparalleled opportunities to stem the climate challenge.

Debunked Myths

In addition to CBD lessons learned, a few false and persistent attacks must be addressed:[112]

1. "The CBD will lock up land." This is absolutely not true. No land or water or air use changes in the United States are required or anticipated as a result of the Convention. Nothing in the text of the treaty, nor its implementation over the last fifteen years, gives even the slightest indication that the CBD will require any alteration of any natural resource issue/biological diversity issue in the United States. For example, no new large networks of wilderness or roadless area can or will be required by ratification of this treaty. Further, no changes to private land rights would occur as a result of treaty ratification. Because CBD is a framework convention, specific actions under the treaty must be agreed upon by the U.S. Government—fully consistent with U.S. legal procedures and rights.
2. "The UN will win lawsuits against me." This, too, is incorrect. Nothing in the text of the treaty, nor its implementation, gives any authority under the U.S. Constitution or any other law to provide an independent cause of action in a U.S. court. Biodiversity concerns already

are a part of NEPA analysis, irrespective of U.S. ratification of the treaty. The CBD is not regulatory.

3. "The operation of the CBD will cause financial harm to the United States." This is also wrong. Participation in the Convention will save the United States money in the long run. The treaty does not mandate any significant expenditure of U.S. funds and, indeed, would almost certainly result in the more efficient use of financial resources by helping coordinate federal agencies, link other international agreements, and utilizing all available capital networks. Notably, the United States is a member of the GEF,[113] which is now the approved financial mechanism of the Convention but was not so when the Senate Foreign Relations Committee last actively took up the Convention. The GEF gives United States more voting control than does a straight up/down vote at the CBD.[114] The long-term objectives of the GEF Biodiversity Program are to catalyze sustainability of protected area systems, mainstream biodiversity in production landscapes/seascapes and sectors, safeguard biodiversity, and build capacity on access and benefit sharing.[115] CBD ratification would reinforce these efforts and give the U.S. even more influence.

Next Steps for the Obama Administration and the U.S. Senate

Prioritization at the State Department

The many and diverse supporters of the CBD have been disappointed that Secretary Hillary Rodham Clinton's State Department has to date omitted the CBD as a priority treaty deserving of short term ratification.[116] This can be easily rectified. While immediate ratification of the U.N. Law of the Sea Convention is certainly desirable, the trio of oceans, climate, and overall biodiversity are sensibly considered together. There is a logical argument to be made that the ITGPR should be considered in tandem with the CBD because the two are complementary.

Hearing Before the Senate Foreign Relations Committee

Updating and building upon the information already gathered by the U.S. Senate, as well as the records of the U.S. Department of State and other federal agencies, the Senate Foreign Relations Committee should as soon as possible hold a ratification oversight hearing before a vote on the Senate floor, for which 67 "aye" votes are necessary under the U.S. Constitution. Although a new hearing is not technically required by the Senate rules for ratification, it would allow the new Administration to brief the Congress and the public on its plans and changes that have occurred over the past fifteen years. Such a hearing would allow further consensus to develop around the key positive points of the CBD.

Chairman John Kerry (D-MA) and Ranking Member Richard Lugar (R-IN), both past supporters of the Convention, should receive updates on the following issues:

1. Access and benefit-sharing ("ABS") of genetic resources and other components of biological diversity, current negotiations at the CBD and other fora, and the precise relationship and lessons of the ITPGR to the CBD. The ITPGR contains an ABS multilateral system for essentially 35 core plant species along with a standard model material transfer agreement.[117] The ITPGR negotiation and ratification effort was supported by the Clinton and Bush II administrations.[118]
2. Understanding of the intersection between the CBD and global warming/climate change/ocean acidification abatement efforts.

The following individuals could potentially be asked to testify:

International Community

- Representative of the CBD
- Representative from the United Nations Environment Program
- Minister(s) from allies that have ratified the CBD (e.g., Japan, Germany, United Kingdom, India, Mexico, South Africa, Iraq).

U.S. Government

- Secretary of State, or Undersecretary
- CEQ Head
- EPA Administrator
- Secretary of the Interior
- Secretary of Agriculture
- Secretary of Commerce, Administrator of N.O.A.A.

Private and Public Interest Sectors

- Representatives from bio-technology and agriculture industries
- Representatives from scientific, educational, and conservation organizations
- Experts on international relations, global environment, national security

Committee Supplemental Report (Proposed)

A supplemental report out of the Senate Foreign Relations Committee to the full Senate for floor consideration should affirm:

1. No new or state or federal law is needed to ratify or implement the Convention on Biological Diversity, and the United States retains all existing sovereignty;
2. The ITPGR could be ratified by the U.S. Senate in tandem with the CBD, as the two agreements' provisions on ABS are complimentary and mutually supportive with U.S. diplomatic leadership;
3. The Senate does not need to take a position upon ratification of the Cartagena Protocol on Biosafety because the CBD does not require the U.S. to approve it now (or ever).[119]
4. Existing Congressional committees will continue to set "biodiversity" funding levels with sufficient instruction and oversight through the federal appropriations process mandated by the Constitution.

Conclusion

U.S. leadership is needed to protect domestic and global biological resources. According to the best experts in the field, the past 50 years have witnessed changes in natural systems more rapid and extensive than in any comparable period of time in human history. The species extinction rate has increased by as much as 1,000 times background rates, and upward of one-third of mammal, bird, and amphibian species are now threatened with extirpation. The time to act is now. It is time for the United States to join the CBD.

The United States was a leader in drafting the Convention on Biological Diversity in the late 1980s and early 1990s, and the United States again needs to protect its interests. The United States currently has only observer status in the COP. Ratification of the Convention will, for instance, allow the U.S. to gain an official seat at the table for future decisions and negotiations under the Convention, including the pending negotiations of an ABS legal binding instrument.

The Convention will not necessitate the addition, repeal, or change of any U.S. laws. The U.S. State Department's transmittal package to the U.S. Senate found that no new legislation would be needed to implement the Convention. President Clinton signed the Convention and the State Department transmitted it with accepted legal understandings in 1993-94. These understandings included statements ensuring that "the existing balance of Federal and State authorities" would not be disrupted and that the "intellectual property rights" of Americans would not be weakened under the treaty. The Senate Foreign Relations Committee favorably reported the Convention to the Senate floor in 1994 on a strong and bipartisan vote of 16-3. This should not be a controversial issue.[120] The CBD's values are as American as apple pie.[121]

The CBD is an important tool to help address the impacts of global warming, unstable weather patterns, and other abrupt changes caused by stressed ecological systems. The CBD helps humans and wild species impacted by these habitat changes through adaptation measures. Protecting biodiversity maximizes the resilience of ecosystems and large regions, indeed the entire world, so that use of land, water and air is done sustainably. This is good for food and water security, overall global well-being, and the long-term maintenance of biodiversity's many economically beneficial services. The CBD is the one legal tool that brings these important issues together. It should be ratified by the U.S. Senate in short order because it is without legal controversy, it will benefit the United States' people, and it will make the world a better place for all its inhabitants.

Endnotes: Joining the Convention on Biological Diversity: A Legal and Scientific Overview of Why the United States Must Wake Up

1 Convention on Biological Diversity, *opened for signature* Jun. 5, 1992, 1760 U.N.T.S. 79, 31 I.L.M. 818 [hereinafter CBD].

2 *Id.* art. 2.

3 *See generally* S. Rep. No. 103-30, at 2-3 (1994) (The Senate Report on the CBD is an authoritative compilation of issues on both the treaty and U.S. interests in biological diversity).

4 *See, e.g.*, Edward O. Wilson, Diversity of Life 343 (1992) ("The Sixth Great extinction spasm of geologic time is upon us, grace of mankind."). *See generally* Stephen M. Meyer, The End of the Wild (2006) (showing that many recent studies confirm this significant downward trajectory).

5 *See generally* IUCN Red List, Species Extinction – The Facts (2007) [hereinafter IUCN], *available at* http://cmsdata.iucn.org/downloads/species_extinction_05_2007.pdf.

6 *See* Robert Costanza et al., *The Value of the World's Ecosystem Services and Natural Capital*, Nature, May 15, 1997, at 253-260; *see generally* Gretchen Daily et al., *Ecosystem Services: Benefits Supplied to Human Societies by Natural Ecosystems*, Issues in Ecology, Spring 1997.

7 *See* Bernstein et al., Climate Change 2007: Synthesis Report 72-73 (2007) (asserting that the specter of global warming is a huge shadow over the planet's plants and animals, given that we are already above carbon dioxide (and other greenhouse pollutant) limits where potentially irreversible ecological changes could occur. The Intergovernmental Panel on Climate Change ("IPCC") found that the resilience of many ecosystems is likely to be destroyed by the dangerous combination of global warming threats and more "traditional" threats.); Chris D. Thomas et al., *Extinction Risks from Climate Change*, Nature, Jan. 8, 2004, at 145-48 (concluding that too many species are already extinct due to global warming, such as dozens of harlequin frog species, or endangered with extinction, such as the polar bear, Edith's checkerspot butterfly, Kittlitz murrelet, American pika, and various coral reef ecosystems); Camille Parmesan & Gary Yohe, *A Globally Coherent Fingerprint of Climate Change Impacts across Natural Systems*, Nature, Jan. 2, 2003, at 37-42 (highlighting that numerous scientists have reported a "globally coherent fingerprint of climate change impacts across natural systems" with three major manifestations: (1) earlier timing of spring events and later autumn events ("phenology" changes); (2) extension of species' range poleward or upward in elevation; and (3) decline in species adapted to cold temperatures and an increase in species adapted to warm temperatures.); *see generally* Camille Parmesan & Galbraith Hector, Pew Center on Global Climate Change, Observed Impacts of Global Climate Change in the U.S. (2004) (reporting that scientists have already predicted significant extinction rates by 2050 under a spectrum of emissions scenarios).

8 James Hansen et al., *Target Atmospheric CO2: Where Should Humanity Aim?*, The Open Atmospheric Sci. J., 217, 217-29 (2008) (positing that 350 parts per million of atmospheric carbon dioxide pollution levels should be our societal target despite being at 385 ppm in 2009).

9 *See, e.g.*, United Nations Envtl. Programme, Blue Carbon: The Role of Healthy Oceans in Binding Carbon 5 (2009).

10 *See, e.g.*, The IUCN Red List of Threatened Species, Summary Statistics (2010) (showing the plants and animals currently threatened with extinction), *available at* http://www.iucnredlist.org/about/summary-statistics; Population Viability Analysis (Steven Beissinger & Dale McCullough, eds., 2002) (cross-cutting examination of mathematical degree of risk facing imperiled species; scientific data on shrinking species' range, resource availability, and other human-induced threats).

11 *See* Millenium Ecosystem Assessment, *available at* www.millenniumassessment.org/en/index.aspx (indicating that the Millennium Assessment, finished in 2005, is a series of synthesis, scale, framework, and summary reports on biodiversity, desertification, wetlands and water, business and industry, and public health).

12 *See* Millenium Ecosystem Assessment, Millenium Ecosystem Assessment Findings, *available at* www.millenniumassessment.org/documents/document.359.aspx.ppt [hereinafter Findings].

Endnotes: Joining the Convention on Biological Diversity *continued on page 44*

Livestock Animal Cloning:

This Steak is Giving Me Déjà Vu

*by Blake M. Mensing**

Somatic cell nuclear transfer,[1] more commonly known as cloning, received international attention when scientists introduced Dolly the Sheep, the first mammal ever successfully cloned using an adult cell.[2] In many American minds, cloning evokes Frankensteinian images of mad scientists and their quest to throw off the shackles of nature's limitations. In the real world, cloning probably only shares one trait with the trials and tribulations of science fiction's most memorable characters: an enormously high rate of failure.[3] The motivations behind animal cloning are purportedly to "maintain high quality and healthy livestock to supply our nutritional needs and consumer demand," and to continue the genetic lines of superior animals.[4] Supporters of animal cloning are even touting the potential benefit to endangered species that cloning offers.[5] These claims belie the danger that animal cloning poses to the planet's biodiversity and to human health. This article will examine the potential impact that widespread livestock cloning could have on agricultural biodiversity, the status of cloned meat product regulation, a piece of proposed legislation which would mandate labeling for packages containing cloned animal meat, and how these issues affect consumer choice.

Biodiversity's layer of protection against the spread of diseases would be eliminated if cloned animals were introduced into the industrial livestock system.

Biodiversity, or the variability among living organisms,[6] is a safety net that protects against the spread of diseases in the wild and among livestock populations.[7] Cloning is by definition an attempt to stick with one set of genes, considered desirable by the purchaser of a clone or by breeders, by creating exact copies of the source animal. This replication flies in the face of biodiversity and also raises a host of ethical issues.[8] In January of 2008, the U.S. Food and Drug Administration ("FDA") announced that it had completed its review of the health effects of cloned meat and that cloned "meat and milk from clones of cattle, swine, and goats, and the offspring of clones from any species traditionally consumed as food, are as safe to eat as food from conventionally bred animals."[9] The FDA is not requiring products from cloned animals, or their offspring, to bear any label differentiating the product from conventionally bred meat because, the FDA states, there is no difference.[10] This article will not cover the many ethical implications of cloning but instead will discuss the potential dangers posed by monogenetic herds and the implications of the FDA's approval of cloned meat for human consumption and the current lack of labeling requirements.

The FDA ignored the potential impacts on biodiversity that cloning could have if it becomes an oft-used cog in the industrial agricultural machine. Critics are leveling accusations of scientific insufficiency at the FDA for the studies it used to reach its conclusions on the safety of cloned animal products.[11] Specifically, the Center for Food Safety has issued a petition seeking FDA regulation of cloned animal products in part because of the lack of scientific data on the potential negative impacts on biodiversity due to cloning.[12] The Center for Food Safety requested that the FDA regulate cloned animals as a "new animal drug,"[13] which would subject cloned meat products to regulation under the Federal Food, Drug, and Cosmetic Act.[14] The major criticisms of the FDA studies were that they were scientifically inconclusive and that they were conducted with financial support from companies with a vested interest in the outcome.[15] Digging down into the actual studies the FDA used in its assessment of cloned animal products reveals a stark deficiency.[16] Furthermore, the Biotechnology Industry Organization's own public disclosure documents reveal that the group spent $1.9 million on related lobbying in the first quarter of 2008, which raises troubling suspicions about the independence of the FDA's risk assessment.[17]

Monocultures create an enhanced risk of disease because the lack of genetic diversity, if that type of animal or plant is susceptible to a disease, means that all animals in a herd could potentially perish if exposed to that disease.[18] Modern industrial livestock operations use concentrated animal feeding operations ("CAFO")[19] that confine animals in close proximity to increase the efficiency of the animals' conversion of grains into saleable meat products.[20] If CAFOs started using cloned animals, which

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would be permissible today after the FDA's approval of cloned meat products for human consumption, the incredible number of genetically identical animals being kept in close confinement would leave that herd susceptible to the rapid spread of diseases.[21] Cloned animals, like today's CAFO residents, would require antibiotics in their feed to stave off disease.[22] Biodiversity's layer of protection against the spread of diseases would be eliminated if cloned animals were introduced into the industrial livestock system.[23]

With all of the potential risks[24] stemming from cloned meat products, and the very real potential that these products will be, or are,[25] in the stream of commerce, the question becomes: what has been done to protect the American public? Senator Mikulski (D-MD) and Congresswoman DeLauro (D-CT) introduced[26] closely related bills, which were both called the Cloned Food Labeling Act,[27] to the House and Senate in 2008. The bill, an amendment to the Federal Food, Drug, and Cosmetic Act, would have required that all meat products that originated from a clone or its offspring would have had to bear a label, included on the nutrition information section of the package, indicating that "THIS PRODUCT IS FROM A CLONED ANIMAL OR ITS PROGENY."[28] The Biotechnology Industry Organization believes this label would mislead consumers because the FDA has found that cloned meat products are no different than products from conventionally bred animals.[29]

The Cloned Food Labeling Act stalled in the U.S. Senate Committee on Health, Education, Labor, and Pensions, and was not presented to the Senate for debate.[30] Similarly, the House version made it no further than its referral to the Subcommittee on Specialty Crops, Rural Development, and Foreign Agriculture.[31] Congress' failure to push these bills through for a vote leaves consumers uninformed and means that cloned food could be passing unwilling lips.[32] The Cloned Food Labeling Act should be reintroduced in the House and the Senate because consumers ought to have the right to decide whether to ingest cloned animal products. Without a label, that choice is being taken away.

Despite the lack of labeling requirements, unsuspecting consumers currently have one option if they want to avoid cloned food. The United States Department of Agriculture's "USDA Organic" label does not and will not permit products bearing that label to contain any cloned animal products.[33] Consumer choice is an important issue and if the Cloned Food Labeling Act is not reintroduced and enacted, the USDA Organic label may be the only option for consumers looking to avoid cloned meat. While the cost of a single clone is already quite high at $10,000-20,000,[34] the FDA has overlooked the social and environmental costs in its approval of cloned animal products.

Livestock cloning poses a risk to agricultural biodiversity and the FDA's approval of cloned animal products for human consumption was based on insufficient scientific evidence. The Cloned Food Labeling Act would provide consumers with the information needed to avoid cloned animal products if they so desired. If left without a choice, American consumers may be subjected to meat products that are at the very least ethically distasteful, and at worst, are products that denigrate the precautionary principle beyond all recognition. Members of Congress, if presented with a reintroduced Cloned Food Labeling Act, should vote to enact this law because freedom of choice should always receive the support of elected officials for the benefit of society.

Endnotes: Livestock Animal Cloning: This Steak is Giving Me Déjà Vu

1 ScienceDaily.com, Science Reference, Somatic cell nuclear transfer, http://www.sciencedaily.com/articles/s/somatic_cell_nuclear_transfer.htm (last visited Apr. 4, 2010) (describing how a somatic cell, a body cell other than a sperm or egg cell, has its nucleus removed and implanted into a recently emptied egg cell, which reprograms the implanted nucleus, and is then electrically shocked to induce it to divide).

2 ScienceDaily.com, Science Reference, Dolly the Sheep, http://www.sciencedaily.com/articles/d/dolly_the_sheep .htm (last visited Apr. 4, 2010) (noting that while there were other successfully cloned mammals, Dolly was unique precisely because she was the first mammal to be cloned using somatic cell nuclear transfer).

3 Foodanimalconcerns.org, The Comments of Food Animal Concerns Trust to U.S. Food and Drug Administration Center for Veterinary Medicine, http://www.foodanimalconcerns.org/PDF/FACT_cloning_comments_04%5B1%5D.07_final.pdf (citing Panarace, et al., *How healthy are clones and their progeny: 5 years of field experience*, 67 Theriogenology 142, 142–51 (2007), which noted that cloning has a historical failure rate of approximately 90%).

4 Bio.org, Biotechnology Industry Organization Fact Sheet, Animal Cloning, http://www.bio.org/foodag/animals/ factsheet.asp (last visited Apr. 4, 2010) (lauding the benefits of animal cloning and claiming that it is really a form of animal husbandry that echoes the tradition of using artificial means to produce the strongest characteristics in livestock) [hereinafter BIO Fact Sheet].

5 *See id.* (suggesting that cloning endangered species is a way to protect them, while ignoring the obvious role that industrialized agriculture has on driving many species to the brink of extinction).

6 *See*, *e.g.*, Convention on Biological Diversity art. 2, June 5, 1992, 1760 U.N.T.S. 79 (defining biodiversity as: "[T]he variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems"). *See generally,* Center for International Environmental Law, http://www.ciel.org/Biodiversity/WhatIsBiodiversity.html (last visited Apr. 23, 2010) (listing the benefits of biodiversity, including the provision of food security).

7 Debora MacKenzie, *Disease runs riot as species disappear*, New Scientist, July 1, 2009, *available at* http://www.news.practicechange.net/?p=564#more-564 (discussing a report that shows an inverse relationship between biodiversity and disease rates).

8 *See* Endanimalcloning.org, Ethics, http://www.endanimalcloning.org/ethics.shtml (last visited Apr. 5, 2010) (citing sources that list a host of ethical issues raised by cloning including the conception of livestock as commodities and not living, sentient beings, the unnatural process involved, and the concern of animal welfare).

9 Press Release, U.S. Food and Drug Admin., FDA Issues Documents on the Safety of Food from Animal Clones (Jan. 15, 2008) *available at* http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ 2008/ucm116836.htm (announcing the release of a risk assessment, which found no difference between the meat or milk from cloned animals and their progeny and conventionally conceived animals, a risk management plan, and a guidance document for industry use).

Endnotes: Livestock Animal Cloning: This Steak is Giving Me Déjà Vu *continued on page 47*

Endocrine-Disrupting Chemical Pollution: Why the EPA Should Regulate These Chemicals Under the Clean Water Act

*by Jacki Lopez**

Introduction[1]

The National Institute of Environmental Health Sciences ("NIEHS") defines endocrine disruptors as "chemicals that may interfere with the body's endocrine system and produce adverse developmental, reproductive, neurological, and immune effects in both humans and wildlife."[2] It notes that a wide variety of substances, including pharmaceuticals, dioxins, polychlorinated biphenyls ("PCBs"), dichlorodiphenyltrichloroethane ("DDT") and other pesticides, and plasticizers such as bisphenol A (commonly known as "BpA") can cause endocrine disruption.[3]

Endocrine disruptors, also known as endocrine-disrupting chemicals ("EDCs"), exist throughout our environment and work in a variety of nefarious ways. They can mimic naturally occurring hormones like estrogens and androgens, thereby causing overstimulation of the endocrine system.[4] EDCs can bind to receptors within cells and block endogenous hormones from binding, causing interference with the production or control of natural hormones and their receptors.[5] The latest scientific knowledge indicates that EDCs persist throughout the environment, including in our nation's waters, and are having profound effects on fish, wildlife, and humans.[6]

Yet, the U.S. federal government has done very little to protect human health or the environment from these harms. A patchwork of regulatory mechanisms exist—through the Federal Food, Drug, and Cosmetic Act; Safe Drinking Water Act; Toxic Substances Control Act; Resource Conservation and Recovery Act; Consumer Product Safety Improvement Act; and the Clean Water Act. However, as currently implemented, these mechanisms at best provide a regulatory net full of holes whereby EDCs enter and pervade our environment and have astonishing effects. Perhaps the most promising of all existing frameworks is the Clean Water Act ("Act"), which if implemented fully could both limit human exposure to waterborne EDC pollution, as well as protect aquatic environments and species from EDC harm.

Clean Water Act

The Act's Role in Regulating Endocrine-Disrupting Chemicals

The Act aims "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[7] The "national goal" of the Act is to guarantee "water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation."[8] Toward these objectives, the Act provides a variety of tools to control water pollution from all sources. Foremost, the Act requires that states adopt water quality standards based on the National Recommended Water Quality Criteria ("Criteria").[9]

The Act requires the EPA to establish the Criteria,[10] publish information on the protection of water quality,[11] and guide states in their adoption and periodic review of water quality standards.[12] The Criteria and information required by section 304 of the Act are significant because they establish a baseline for nationwide implementation of the Act. State water quality standards include designated uses, water quality criteria sufficient to protect the designated uses, and an anti-degradation policy.[13] Guided by EPA's Criteria and information, states must either adopt the Criteria in their water quality standards or provide a science-based explanation for their alternate criteria.[14] Each state is also required to "identify those waters within its boundaries for which the effluent limitations . . . are not stringent enough to implement any water quality standard applicable to such waters."[15] States must identify any water body failing to meet any numeric criteria, narrative criteria, water body use, or anti-degradation requirements, and the Act requires states to establish total maximum daily loads ("TMDLs") for pollutants "at a level necessary to implement the applicable water quality standards."[16] Therefore, water quality standards provide a mechanism for states to regulate all sources of pollution that are degrading water quality.

Section 304 of the Act mandates that the EPA revise the Criteria "from time to time" to reflect the "latest scientific knowledge."[17] As the basis for state water quality standards and pollution controls, it is crucial that the Criteria reflect the latest science. The duty to review and consider the latest scientific knowledge, among other factors, is a non-discretionary duty.[18]

The EPA's Criteria are at the heart of protecting water quality across the nation. In effect, the Criteria are the floor for water quality standards (with states left free to establish a higher ceiling), and, when federal criteria do not exist, water quality throughout the nation suffers. Despite the statutory mandate to establish Criteria for EDCs, the EPA has failed to update and revise its Criteria to establish limitations for EDCs sufficient to protect against endocrine disruption.

* *Ms. Lopez is a staff attorney at the Center for Biological Diversity who, in January 2010, petitioned the EPA asking it to update and revise its National Recommended Water Quality Criteria to reflect the latest scientific knowledge that endocrine-disrupting chemical pollution is harming aquatic life and water quality. This article is based in part on Ms. Lopez's work on the submitted petition.*

The Latest Scientific Information on Endocrine-Disrupting Chemicals

Researchers have recently discovered that a number of contaminants can have the potential for deleterious effects on aquatic ecosystems.[19] These contaminants include pesticides, pharmaceuticals and personal care products ("PPCPs"), and other compounds that can evoke hormonal responses in fish and wildlife.[20] EDCs can interfere with the synthesis, secretion, transport, binding, or elimination of natural hormones in the body.[21] They can compromise normal reproduction, development, growth, and homeostasis.[22] EDCs have become ubiquitous in our nation's water bodies, entering them largely through runoff and treated wastewater discharges.[23]

EDCs find their way into our environment through a surprising array of unchecked mechanisms. Ingested drugs, for example, are excreted in varying metabolized amounts (primarily in urine and feces) and end up in municipal sewage treatment plants where they then enter our waterways as treated wastewater effluent.[24] EDCs leach from municipal landfills and can be found in the runoff from concentrated animal feeding operations and medicated pet excreta. EDCs also come from aquaculture, spray-drift from agriculture,[25] and the direct discharge of raw sewage.

An EPA internal planning document recognizes that EDCs discharged from wastewater treatment plants are contaminants of emerging concern with potentially widespread environmental effects.[26] Municipal wastewater contains a multitude of EDCs, many of which derive from the domestic application of active ingredients found in PPCPs.[27] PPCPs are constantly entering rivers and groundwater via treated municipal wastewater. Betablockers, antibiotics, antiphlogistics, estrogens, antiepileptics, and contrast agents have been detected in many of our nation's waters.[28] These EDCs are affecting the biological, chemical, and physical integrity of our water, including having profound effects on the flora and fauna that rely on clean U.S. waters.[29]

In 2008, the Associated Press reported the detection of pharmaceutical residues in the drinking water of twenty-four major metropolitan areas, serving forty-one million people.[30] The pharmaceuticals detected included antibiotics, anticonvulsants, and mood stabilizers.[31] Supporting these findings, the United States Geological Survey ("USGS") reports that a sample of 139 streams in thirty states, eighty percent of the sampled sites contained organic wastewater contaminants and pharmaceuticals—including antibiotics, hypertension- and cholesterol-lowering drugs, antidepressants, analgesics, steroids, caffeine, and reproductive hormones.[32]

Many pesticides are also EDCs. According to a recent USGS report, "[T]he most widespread potential impact of pesticides on water quality is adverse effects on aquatic life and fish-eating wildlife, particularly in streams draining watersheds with substantial agricultural and urban areas."[33] All of the pesticides surveyed in the study are known endocrine disruptors and enter our nation's water bodies through runoff and spray-drift.[34]

The latest scientific knowledge indicates that EDCs persist throughout the environment, including in our nation's waters, and are having profound effects on fish, wildlife, and humans.

EDCs Are Likely Harming Endangered and Threatened Species

The Endangered Species Act ("ESA") prohibits the "take" of endangered species.[35] The ESA defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" endangered species.[36] The U.S. Fish and Wildlife Service has further defined "harm" to include "significant habitat modification or degradation" that "actually kills or injures wildlife by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering."[37] EDCs enter our waterways pursuant to the authority delegated to the EPA under the Clean Water Act. There is evidence that EDCs are significantly degrading habitat, including federally designated critical habitat, and are likely injuring fish and wildlife by disrupting behavior patterns such as breeding ability.[38] Therefore, EPA has a heightened duty under the ESA to establish and enforce Criteria for EDCs to prevent harm to endangered species.

A litany of studies confirms that EDCs are presently harming fish and wildlife throughout the nation.[39] A 2009 study by Jenkins, et al., investigated the impacts of effluents from wastewater treatment plants using the western mosquitofish as a surrogate fish model.[40] They detected fifteen organic wastewater compounds and EDCs, and samples from the point sources of the wastewater effluent showed the compounds with the highest influence on sex steroid hormone activities, compared to other sample sites.[41] In samples closest to the wastewater treatment plants' effluent discharges, male mosquitofish showed the most impairment of endocrine and reproductive function, as evidenced by changes in sex steroid hormone levels, secondary sex characteristics, organosomatic indices, and sperm quality parameters.[42] The study concluded that exposure to EDCs and consequent impairment showed the most significant effects at the wastewater treatment point sources, with gradually lesser effects further away from the point sources.[43]

EDCs May Be Harming the Razorback Sucker

The endangered razorback sucker is found in Las Vegas Bay and Lake Mead and has federally designated critical habitat throughout these water bodies.[44] Razorback suckers are long-lived fish that can grow up to three feet long. Habitat loss and competition with other fish species threatens the species' survival.[45] Blackbird Point at Las Vegas Bay—known spawning habitat for the razorback sucker—is fed by treated wastewater effluent from four wastewater treatment plants upstream.[46] Researchers have found distinct differences between razorback suckers from Las Vegas Bay and razorback suckers from other locations.[47] One study found significantly higher concentrations of estradiol ("E2"), lower concentrations of 11-ketotestosterone ("11KT"), and a higher ratio of E2 to 11KT in male razorback suckers from Las Vegas Bay than those from Echo Bay.[48] DDT residues accounted for more than half the detected OC concentrations in the fish, and PCBs accounted for a third of the total detected OC concentrations.[49] The USGS is currently doing much to study the effects of EDCs in Lake Mead and their effects on the razorback sucker.[50]

EDCs May Be Harming the Desert Pupfish

California's Salton Trough's only endemic species, the endangered desert pupfish, is listed as endangered because of habitat alteration and the effects of water contamination.[51] The species is threatened by contamination from EDCs born from pesticides and effluent.[52] Pesticides suspected of endocrine disruption are used at high rates throughout the adjacent Imperial Valley.[53] Fish and bed sediment in the Imperial Valley have higher concentrations of hydrophonic pesticides, and some believe that exposure to the pesticides chlorpyrifos, diazinon, and malathion used in the Imperial Valley, is contributing to endocrine disruption.[54] After similar exposure to these pesticides, western mosquitofish exhibited endocrine disruption in the form of lower levels of the sex hormone 17 beta-estradiol in females, skewed ratios of estrogen to testosterone in males, altered secondary sex characteristics in males, reduced gonopodium size, and significantly lower sperm counts and proportions of mature sperm.[55] In addition to pesticides, Imperial Valley irrigation water comes from the lower Colorado River, a water source that causes concern due to potential EDC effects.

EDCs May Be Harming the Santa Ana Sucker

Effluents from wastewater treatment plants and urban runoff impact the Santa Ana River. The Santa Ana River basin is one of the only river basins supporting native populations of the endangered Santa Ana sucker. Thirty EDCs have been detected in water from the Santa Ana River, and sex steroid hormone levels, secondary sex characteristics, organosomatic indices, and sperm quality parameters indicate endocrine and reproductive disruption.[56] In studies of the western mosquitofish in these waters, mean E2 values were well above the 1.0 male ratio and were closer to the female value.[57] The study found a strong negative correlation between levels of the plasticizer di(2-ethylhexyl) phthalate ("DEHP") and testosterone levels in males.[58] These endocrine and reproductive effects are likely also negatively impacting the Santa Ana sucker.

EDCs Likely Harm Humans

One critical concern and obstacle to identifying EDC exposure and harm in humans is that there can be a significant lag time, possibly decades, between exposure and the manifestation of a clinical disorder. Another difficulty is the timing of exposure as there may be developmental periods having increased susceptibility to EDCs. Even so, multiple studies already show that EDCs are affecting human health.

One critical concern and obstacle to identifying EDC exposure and harm in humans is that there can be a significant lag time, possibly decades, between exposure and the manifestation of a clinical disorder.

A multi-state epidemiologic study found that women exposed to the plasticizer DEHP had a two day longer gestation length and higher odds for caesarian section delivery.[59] These findings suggest that DEHP may interfere with the hormonally controlled signaling that initiates birth.[60] Another study found that women with detectable levels of DDT and 1-chloro-2-[2,2-dichloro-1-(4-chlorophenyl)ethenyl]benzene ("DDE") higher than typical of U.S. women had menstrual cycles approximately four days shorter and decreased progesterone metabolite levels.[61]

An EPA-funded study discovered that breast-fed girls exposed to high levels of polybrominated biphenyl ("PBB") *in utero* had an earlier age of menarche than breast-fed girls exposed to lower levels of PBB *in utero*.[62] It also found that women with high exposures to PBB in serum had shorter menstrual cycles and longer bleed lengths than women whose exposure levels were undetectable in serum.[63] Another study identified a link between persistent pesticides in human breast milk and cryptorchidism (undescended testicles) in male offspring.[64]

Another EPA-funded report found that exposure to fungicides and herbicides is associated with a 1.5- or two-fold risk of endometriosis in women eighteen to forty-nine years of age.[65] An epidemiological study discovered a positive association

between diabetes and elevated serum PCBs, DDE, and hexachlorobenzene ("HCB") in Native Americans.[66] There is overwhelming evidence of unnecessary human exposure to EDCs and of resulting harmful effects.

EPA Has a Duty to Establish Criteria for Endocrine-Disrupting Pollutants

With regard to what the EPA coins "Contaminants of Emerging Concern" ("CECs") (largely referring to EDCs), "[w]idespread uses, some indication of chemical persistence, effects found in natural systems, and public concerns have made clear the need for EPA to develop criteria that can be used to help assess and manage potential risk of some CECs in the aquatic environment."[67]

Currently, Criteria for aquatic life are based on criterion maximum concentration ("CMC") to protect against acute effects and criterion continuous concentration ("CCC") to protect against chronic effects.[68] CMC is derived from forty-eight to ninety-six hour tests for lethality or immobilization while CCC is from longer-term tests measuring survival, growth, or reproduction.[69] Criteria for human health are designed to protect against long term human health effects based on a lifetime of exposure, and exposure to a pollutant is interpreted as through ingestion of water and contaminated fish and shellfish.[70]

There is overwhelming evidence of unnecessary human exposure to EDCs and of resulting harmful effects.

However, EDCs defy the typical "dose makes the poison" paradigm of toxicology.[71] The EPA Guidelines, "anticipat[ing] that rote application of the basic procedures may not yield the most appropriate criteria," provide flexibility in moving away from normal procedures whenever:[72]

> Sound scientific evidence indicates that a national criterion produced using these Guidelines would probably be substantially overprotective or underprotective of aquatic organisms and their uses on a national basis
>
> -or-
>
> On the basis of all available pertinent laboratory and field information, determine if the criterion is consistent with sound scientific evidence. If it is not, another criterion, either higher or lower, should be derived using appropriate modifications of these Guidelines.[73]

In reviewing the latest scientific knowledge and promulgating the new water quality standards, EPA must incorporate EDC-relevant knowledge. For example, EDCs differ from traditional pollutants in that (1) the timing of exposure is highly critical to the outcome of the exposure (with fetal or early post-natal exposure being the most detrimental due to potential permanent effects); (2) EDCs act at environmentally relevant doses with complex dose-response curves; and (3) the effects of EDCs may not be limited to the exposed individual but can be transmitted to subsequent generations via the germ line.[74] The standard procedures for deriving CMC and CCCs use only toxicity tests meeting certain requirements, but the Guidelines mandate that the collation and examination of other data should be considered.[75]

The case of tributyltin should serve as an example for the EPA in establishing and revising its Criteria for other EDC pollutants. The final acute value using standard derivation procedures for tributyltin was .0658 µg/L even though concentrations linked to imposex and immuno-suppresion in snail and bivalves was in the range of 0.0093-0.334 µg/L.[76] The EPA rightly took this new scientific knowledge into account and lowered the CCC for tributyltin to .0074 µg/L.[77]

The EPA has established Criteria for some known EDCs. Some EDCs, such as PCB, have Human Health Criteria calculations, however, they are not on the matrix because of their endocrine-disrupting potential but because of their carcinogenic potential.[78] New scientific information indicates these EDCs are having substantial effects on fish and wildlife at levels previously deemed acceptable by the EPA. The EPA recognizes that frequency alone is not enough to establish Criteria and that Criteria development "needs to focus efforts on chemicals that demonstrate a reasonable potential to adversely affect aquatic life."[79] It also acknowledges that "there may be chemicals for which regulatory guidance is needed, but for which toxicological data are insufficient to meet the minimum standards of the Guidelines" and that in those cases, "there may still be a need for alternate approaches to derive interim regulatory guidance values on which to base decisions that must be made before sufficient information for a complete water quality criterion can be gathered."[80]

Conclusion

The EPA has a mandatory duty to establish Criteria protective of our nation's waters. Currently, the EDCs entering and persisting in these water bodies are having profound effects on wildlife, fish, and humans. Although the EPA has established Criteria for some of the EDCs, the limits were not designed to protect against EDC harm. Section 304(a) of the Act requires the EPA to develop and publish and "from time to time thereafter revise" Criteria and information.[81] New information that controverts previously held beliefs about water quality and pollutants triggers the EPA's duty to review and revise the Criteria. Therefore, the EPA must revise the Criteria and information to reflect the latest science on EDCs.

Endnotes: Endocrine-Disrupting Chemical Pollution

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Using the Clean Water Act to Protect Our Oceans' Biodiversity

*by Kate Halloran**

National legislation addressing the effects of climate change on our ecosystem has failed to materialize,[1] but environmental advocates have sought other avenues to jumpstart the process. The Center for Biological Diversity, for example, has advanced the Clean Water Act as a vehicle to address the deleterious impact of ocean acidification on marine organisms. Ocean acidification, which some scientists argue has been caused by anthropogenic climate change, alters the chemistry of ocean water and threatens marine biodiversity.[2] As oceans absorb carbon dioxide, pH levels decrease.[3] The decreased pH levels inhibit the ability of many marine organisms, such as coral and plankton, to form protective shells integral to their survival.[4] Loss of these organisms would echo throughout the marine ecosystem.[5] The integrity of the ocean ecosystem is significant not only from an environmental standpoint, but also from an economic perspective.[6] If marine biodiversity suffers irreversible damage from ocean acidification, the effects would ripple throughout the commercial realm, impacting the fishing and tourism industries.[7]

In 2007, the Center for Biological Diversity filed a petition with the United States Environmental Protection Agency ("EPA") requesting an update to existing water quality criteria under section 304(a) of the Clean Water Act ("CWA").[8] The Center for Biological Diversity argued that the pH water quality criteria required revision in light of new scientific data on the impacts of ocean acidification.[9] EPA agreed to evaluate these concerns and published a notice in the Federal Register requesting scientific data on the issue.[10] Despite this agreement, EPA approved a list of impaired waters in Washington that ignored ocean acidification's impacts on the state's coastal waters.[11] The Center for Biological Diversity responded with a lawsuit against EPA.[12] Now, as part of a legal settlement, EPA has issued a notice in the Federal Register soliciting comments on how to address ocean acidification through listing of impaired waters under section 303(d) of the CWA.[13]

The efforts of the Center for Biological Diversity are an important step forward, but the question remains how effective the CWA would be in protecting marine biodiversity from ocean acidification. Section 403(a)(2)(B) of the CWA requires that water quality criteria address "the factors necessary for the protection and propagation of shellfish, fish, and wildlife…"[14] Once section 304(a) water quality criteria are determined, those criteria must be enforced. Section 303(d) is primarily a mechanism for implementing water quality criteria: first, a state compiles a list of waters within its jurisdiction that fail to meet the criteria; and second, the state establishes limits for discharges of pollutants affecting each impaired water body through Total Maximum Daily Loads ("TMDLs").[15] TMDLs generally are effective for managing point sources, where discharge of a particular pollutant is easily traceable and quantifiable. TMDLs for non-point sources present an obstacle for ensuring compliance and enforcement,[16] an especially important consideration when limiting carbon dioxide emissions in ocean waters.

One challenge is determining if and how much non-point sources of carbon dioxide emissions are impacting a coastal area. If that impact can be quantified, there is still the difficulty of attributing those emissions in a way that would promote successful compliance with TMDLs. Currently, TMDLs for non-point sources "are implemented through a wide variety of State, local, and Federal programs, which are primarily voluntary or incentive-based."[17]

Moreover, the geography of the ocean calls for an integrated system of managing ocean acidification. Coastal waters are shared among different states that may have varying water quality criteria, impaired waters lists, and TMDLs. A state only has jurisdiction over its territorial waters, but the reality of managing a vast ecosystem requires cooperation among coastal states to prompt meaningful change.

Another potential issue is regulating carbon dioxide emissions from point sources. Discharges from point sources would require a permit through the National Pollution Discharge Elimination System ("NPDES").[18] Regulating carbon dioxide discharges into oceans may necessitate developing new NPDES permits that incorporate adjusted water quality criteria for ocean acidification to set effluent limitations for discharges,[19] which could be a lengthy and complex process.

A final obstacle is the CWA's capacity to regulate airborne carbon dioxide emissions. Airborne carbon dioxide emissions contribute to the problem, but are not a conventional source of water pollution.[20] While it may be possible to regulate airborne emissions under the CWA, the efficacy of doing so is questionable.[21]

There is no doubt that ocean acidification is a time-sensitive issue endangering the health of our oceans and marine life.[22] The prospect of using the CWA to counteract ocean acidification has focused attention on this often overlooked problem, but is not without its drawbacks. The challenges of implementing these changes serve as a reminder that ocean acidification must be attacked from more than one angle in order to maximize the chance of success in protecting marine biodiversity.

Endnotes: Using the Clean Water Act to Protect Our Oceans' Biodiversity *continued on page 49*

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The Relationship Between the Access and Benefit Sharing International Regimen and Other International Instruments: The World Trade Organization and the International Union for the Protection of New Varieties of Plants

*by Jorge Cabrera Medaglia**

Introduction

This article examines the relationship between the International Regimen ("IR") and the World Trade Organization ("WTO") and International Convention for the Protection of New Varieties of Plants ("UPOV"). The article highlights the potential relationship between the intellectual property rights system and the negotiations on an international regime for access and benefit-sharing within the context of the Convention on Biological Diversity ("CBD"), and identifies some questions requiring further scrutiny. The WTO, World Intellectual Property Organization ("WIPO"), and UPOV each have provisions related to Access to Genetic Resources and Benefit Sharing ("ABS") and Intellectual Property Rights ("IPR"). Meanwhile, there are ongoing negotiations on an international regime governing access to and the equitable sharing of benefits from genetic resources derived from biodiversity under the CBD.

The first section provides a general introduction, while the second gives an overview and a factual description of the other instruments, as well as their provisions related to ABS and the relationships between the IR and the ABS provisions or developments identified. The third section seeks to address the different scenarios and options to achieve mutual supportiveness between the IR and the instruments. Finally, some general conclusions are presented.

The Convention on Biological Diversity and its Relevant ABS Provisions

The Convention on Biological Diversity recognizes the sovereign rights of States over their natural resources in areas under their jurisdiction.[1] The Objectives of the Convention on Biological Diversity are:

1. The conservation of biological diversity;
2. The sustainable use of the components of biological diversity; and
3. The fair and equitable sharing of the benefits arising out of the utilization of genetic resources[2]

According to the Convention, States have the authority to determine access to genetic resources in areas within their jurisdiction. Parties also have the obligation to take appropriate measures with the aim of sharing in a fair and equitable way the benefits arising from the utilization of genetic resources.[3] Two further principles established under article 15 of the CBD are that "access [to genetic resources], where granted, shall be on mutually agreed terms" and "shall be subject to prior informed consent of the Contracting Party providing such resources, unless otherwise determined by that Party."[4] This provides the basic legal framework under the Convention for access and benefit sharing arising from the utilization of genetic resources.

Furthermore, the protection of traditional knowledge, innovations, and practices of indigenous and local communities plays an important role. Traditional knowledge often provides a lead to genetic resources with beneficial properties and can thus form the basis for ABS mechanisms or entitlements. To this effect, Article 8(j) states that:

> each contracting Party shall, as far as possible and as appropriate, subject to national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge innovations and practices.[5]

ABS activities should be based on the Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization.[6]

Current Status and Perspectives of the IR Negotiations[7]

The World Summit on Sustainable Development in Johannesburg in 2002 agreed to the establishment of an international regime to effectively promote and safeguard fair and equitable

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benefit-sharing. On December 20, 2002, Resolution 57-260 of the United Nations General Assembly invited the Conference of the Parties to take the necessary measures regarding the commitment established at the Summit to negotiate this regime.[8] Taken together with the Convention's decision this represents a commitment to create an international regime.

Paragraph 42(n) of the same Johannesburg Plan of Action provided a related commitment to

> Promote the wide implementation of and continued work on the Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of Benefits arising out of their Utilization of the Convention, as an input to assist Parties to the Convention when developing and drafting legislative, administrative or policy measures on access and benefit-sharing, and contracts and other arrangements under mutually agreed terms for access and benefit-sharing.[9]

Decision VII/19 of the Conference of the Parties of the CBD is potentially one of the most comprehensive and detailed of all of the decisions having to do with the issue of access to genetic resources. This decision calls for the Working Group on ABS to meet again

> . . . with the collaboration of the Ad Hoc Open-ended Inter-Sessional Working Group on Article 8 (j) and Related Provisions, ensuring the participation of indigenous and local communities, non-governmental organisations, industry and scientific and academic institutions, as well as intergovernmental organisations, to elaborate and negotiate an International Regime on access to genetic resources and benefit-sharing with the aim of adopting an instrument/instruments to effectively implement the provisions in Article 15 and Article 8 (J) of the Convention and the three objectives of the Convention.[10]

The group has operated in accordance with the terms of reference contained in the Annex to Decision VII/19. The Conference of the Parties also decided on the terms of reference for such a negotiation, including the process, nature, scope, and elements for consideration in the elaboration of the regime. The terms of reference are contained in the annex to Decision VII/19 D.[11] As set out in the Terms of reference of the Working Group on ABS, the IR could be composed of one or more instruments within a set of principles, norms, rules, and decision-making procedures, legally-binding and/or non-binding.

According to these same Terms of reference, the scope of the IR is to include:

- Access to genetic resources and promotion and safeguarding of fair and equitable sharing of the benefits arising out of the utilization of genetic resources in accordance with relevant provisions of the Convention on Biological Diversity;
- Traditional knowledge, innovations and practices in accordance with Article 8(j).[12]

At the eighth meeting of the Conference of the Parties ("COP") in Curitiba, Brazil, the Working Group was requested to complete its work as soon as possible and no later than 2010.[13] In addition to COP 8, two meetings of the Working Group on ABS, as the negotiating body of the international regime, were held prior to the ninth meeting of the Conference of the Parties. The Working Group held its fifth meeting in Montreal, Canada, from October 8-12, 2007,[14] and its sixth meeting in Geneva, Switzerland, from January 21-25, 2008.[15] At its ninth meeting in Bonn, in May 2008, the COP extended the mandate of the Working Group on Access and Benefit-sharing, and instructed it to finalize the negotiation of the international regime before its tenth meeting, in 2010.[16] The COP adopted a detailed calendar of meetings to achieve this objective and decided that the Ad Hoc Open-ended Working Group on Access and Benefit-sharing should meet three times prior to the tenth meeting of the Conference of the Parties. In addition, the COP decided to establish three distinct groups of technical and legal experts to address key substantive issues at the core of the negotiation process.

The seventh meeting of the Working Group, held in Paris, France, in April 2009, focused on the objective and scope of the International Regime, as well as the components of the International Regime related to compliance, benefit-sharing, and access.

At its eighth meeting (November 9-15, 2009, in Montreal, Canada), the Working Group addressed operative text on all components of the regime, and discussed its legal nature. The meeting adopted the Montreal Annex, [17] consisting of a single, consolidated draft of the international regime, and a second annex on proposals for operational texts left in abeyance for consideration at its ninth meeting, referred to as ABS 9. The Working Group also established an intersessional process leading up to ABS 9, including: a Friends of the Co-Chairs group; a Co-Chairs' Inter-regional Informal Consultation; and a series of regional consultations. Given the fundamental disagreements, only a heavily bracketed structure exists as a basis for the negotiations on the regime.[18] The document has four sections, covering the objective, scope, main components, and nature of the regimen. The content of each section, however, identifies various options or is heavily bracketed. The text regarding the main components includes: benefit sharing, access, compliance, capacity building, and traditional knowledge and also reflects the wide divergence of positions among countries.

The inter-regional consultation (March 16-18, 2010, in Cali, Colombia) was held in order to identify concrete solutions to facilitate and accelerate ABS 9 negotiations. As a result, the Co-Chairs prepared a draft protocol and a draft COP decision was circulated prior to ABS 9. At the ninth meeting of the Working Group in Cali, Colombia, from March 22-28, 2010, a draft protocol was tabled by the Co-Chairs and accepted by Parties as a basis for further negotiations. However, since it was not possible to finalize the text at this session, the Working Group decided to suspend the meeting at the end of the seven days and to resume the ninth meeting of the Working Group in order for it to complete its mandate.[19] The text of the Protocol (still subject to negotiation) became Annex I of the Report.[20] Subsequently the CBD Secretary notified[21] formally to the Parties and other stakeholders the text of the Protocol pursuant to article 28 of the CBD.[22] A roadmap to Nagoya was also agreed upon, including

the reassumed session of the ABS/WG to be held in Montreal in July 10-16, 2010. Out of the Cali meeting came a draft protocol text upon which negotiations can move forward towards creating the international regime. But the text is still open for modification and additions.

As a result of the ninth meeting, the Draft Protocol on ABS[23] addresses the following issues of interest for this article: disclosure requirements in IPR applications; the certificate of compliance and technology transfer.[24]

Overview and Factual Description of the Relevant ABS Provisions and Developments at the WTO and UPOV[25]

Factual Overview of Relevant Provisions/ Developments/Processes at the WTO Agreement on Trade-related Aspects of Intellectual Property Rights

Since the entry into force of the TRIPS Agreement, there have been calls, mainly by developing countries, to explore the relationship between the CBD and intellectual property rights ("IPRs"). In parallel, CBD COP decisions[26] have stressed the need to gather information on the impact of IPRs on achieving the objectives of the CBD, and to explore the relationship between the Convention and the TRIPS Agreement.[27]

As early as COP 3,[28] the CBD Secretariat was requested to cooperate with the WTO through the Committee on Trade and Environment ("CTE") to explore the extent to which there may be linkages between CBD Article 15 on ABS and relevant provisions of the TRIPS Agreement. In the WTO context, the TRIPS Council has included the relationship between TRIPS and the CBD on numerous occasions in its discussions.[29] Some of the debates about the links between the CBD and WTO took place in the context of the TRIPS review of Article 27.3(b), which was started by the TRIPS Council during 1999, four years after the entry into force of the Agreement.

There have also been similar discussions regarding the TRIPS Agreement under the CTE, including protection of Traditional Knowledge; the transfer of environmentally sound technology; ethical concerns associated with the patenting of living organisms; and compatibility between TRIPS and the CBD.[30]

The TRIPS Council has also discussed what the implications of IPRs are for access to and transfer of technology. One view has been that IPRs in respect of genetic resources could impede access to and raise the cost of technology in this area, by virtue of the exclusive rights given to rights-holders to prevent others from using the protected technology. In response, it has been argued that full implementation of the TRIPS Agreement in developing countries would stimulate investment in those countries and that, therefore, facilitated technology transfer forms part or the basis of benefit sharing as envisaged under the CBD.[31] Technology transfer is also a relevant issue addressed by the CBD. Article 16 of the CBD on access to and transfer of technology contains numerous references to IPRs. CBD COP 7 adopted a program of work on technology transfer and technological and scientific cooperation, which required the CBD Secretariat to prepare, in collaboration with UNCTAD, WIPO, and other relevant international organizations, technical studies[32] to explore and analyze the role of IPRs in technology transfer, in the context of the CBD, and identify potential options to increase synergy and overcome barriers to technology transfer and cooperation.[33]

Later, in 2001, the Doha Declaration, which launched the current round of trade negotiations, specifically instructed the TRIPS Council to examine the relationship between the TRIPS Agreement and the Convention on Biological Diversity, the protection of traditional knowledge and folklore, and other new and relevant developments pointed out by the Members.[34] In particular, the TRIPS Council shall take this into account in conducting the examination provided for in paragraph 3(b) of article 27; the examination of the application of the TRIPS Agreement provided for in paragraph 1 of article 71; and in its work in compliance with paragraph 12 of the Declaration. In carrying out this work, the TRIPS Council shall be governed by the objectives and principles stated in articles 7 and 8 of the TRIPS Agreement and shall fully consider the dimension of development.

Though this debate was originally wide-ranging,[35] it now focuses on how the TRIPS agreement relates to the CBD and particularly whether the agreement should be amended to require disclosure in IPR applications, which has been discussed in the WTO based on the mandate established in Doha, or whether alternative approaches, including contractual based systems or databases of genetic resources and traditional knowledge, could be more effective in ensuring mutual supportiveness between the TRIPS and the CBD.

One of the first measures suggested in order to achieve mutual supportiveness between the CBD and intellectual property systems (in particular, the WTO TRIPS) was the disclosure of the origin of genetic resources or associated traditional knowledge in intellectual property rights applications, particularly in patents. It has been suggested by developing countries mostly that the TRIPS Agreement should be amended so as to require that patent applicants disclose, as a condition to patentability one or more of the following: the source and origin of any genetic material used in a claimed invention; and/or any related traditional knowledge used in the invention; evidence of prior informed consent from the competent authority in the country of origin of the genetic material; and evidence of fair and equitable benefit sharing. Proponents of disclosure requirements argue that this stipulation would help to support compliance with the CBD provisions on access to genetic resources and benefit-sharing.[36] In response, it has been expressed that such a modification is not necessary to implement the CBD requirements as they should be implemented through corresponding contracts at the national level, and that the TRIPS Agreement is not the appropriate instrument to regulate ABS.

The Declaration adopted at the Ministerial Summit in 2005 in Hong Kong provides (in paragraph 44) that note be taken of the work carried out by the TRIPS Council, in accordance with paragraph 19 of the Doha Declaration, and agrees that work will continue based on this paragraph and on the progress made to

date.[37] In addition, in accordance with paragraph 39 concerning implementation, it was decided to address the relationship between the TRIPS Agreement and the CBD through a consultation process on different aspects of implementation.[38] This consultation is being carried out with the intervention of the Deputy Director General of the WTO.

In May 2006, six countries, including India, Brazil, and Peru, submitted a proposal to the TRIPS Council suggesting concrete changes to the TRIPS Agreement in order to support disclosure of origin. The Communication[39] aims to incorporate a new article 29 bis into the TRIPS Agreement. It proposes an amendment to the TRIPS Agreement to incorporate requirements for disclosure of the origin of genetic resources[40] and associated traditional knowledge in patent applications along with evidence of prior informed consent and benefit-sharing.[41]

At the Mini-Ministerial Conference held in July 2008,[42] not much changed. A determination regarding the proposed amendment to the TRIPS Agreement to incorporate the disclosure of origin remains to be made at the WTO. A Draft Modality text on IP was presented including negotiations on disclosure.[43] The Draft called[44] for text based negotiations on the IP issues, including disclosure. This Draft Modalities proposal for negotiating the IP issues at the Ministerial level has gathered the support of the majority of developing country Members and some developed countries as well. A large coalition of more than a hundred developing and developed countries led by Brazil, the EU, India, and Switzerland, were pushing for the three TRIPS issues to be moved forward as a single undertaking in the Round, but the proposal was strongly rebuffed by some country Members who contended that the intellectual property issues should not be discussed in tandem with the Doha negotiations on liberalizing trade in agricultural and industrial goods.

The issue of disclosure was also raised at the several TRIPS Council Meetings after the July Mini-Ministerial[45] in 2009 and 2010, with similar results. In essence, countries largely reiterated known positions on the relationship between the TRIPS Agreement and the Convention on Biological Diversity. Meanwhile, informal consultations on how to move the issue forward are ongoing. However, like all issues discussed at the July Mini-Ministerial Conference, the future of the TRIPS issues depend upon the future of the negotiations.

Due to the nature of a legally binding instrument of the [Access and Benefits Sharing] Protocol, the countries should develop—in their national legislation—disclosure of origin requirements to comply with the international obligations.

Relationship between the IR and WTO

As presented in the previous section, discussions on the relationship between the CBD and the WTO provisions have addressed a range of issues and several proposals have been presented. However, the current debate has focused on the disclosure of origin in patent applications or whether alternative approaches including contractual based systems or databases of genetic resources and traditional knowledge could be more effective in ensuring mutual supportiveness between TRIPS and the CBD. In addition, technology transfer ("TT") is a relevant issue connecting the IR and the WTO.

There are other issues connecting the WTO and the potential IR, but they can be briefly mentioned here, including: the applicability of the WTO investment provisions to the ABS activities; and the relationships between the Principle of Non Discrimination (the Most Favored Nation and National Treatment Principles); and ABS legislation and practices, among others.[46]

- Disclosure of origin

The Annex of Decision IX/12 has identified five components for the IR. These include: access; fair and equitable benefit sharing; compliance measures; traditional knowledge; and capacity building. Under the Compliance component one of the measures for "further consideration"[47] is the disclosure requirements. Decision VIII/4/D is more clear about disclosure in the context of the CBD IR negotiations.[48] The Draft Protocol[49] provides

> In implementing Article 12, paragraph 1, Parties shall take measures, as appropriate, to monitor the utilization of genetic resources, including from derivatives produced through expression, replication and characterization, having regard to the list of typical uses of genetic resources provided in Annex II of the present Protocol. Such measures include: (a) The identification and establishment of check points and disclosure requirements including at
>
> **(iv)** Intellectual property examination offices[50]

- Certificate of Origin/Source/Legal Provenance/Compliance.[51]

One element ABS negotiations have focused on in order to respond to the call for user country measures, and to contribute to solving problems related to the monitoring and traceability of genetic resources, is the development of some form of certificate of origin/source/legal provenance—more recently called a "certificate of compliance." The idea of the certificate is to prevent

or minimize problems generated by the existence of two different jurisdictions for ABS arrangements—that of the place where the material is collected and that of the place where research and development activities are carried out. The existence of an internationally recognized document would make it possible to check the legality of access at the place where the activity (patent, product approval, etc.) generates value, and to discover the subsequent use of the resources and the origin of the corresponding benefit-sharing. At the same time, this supposedly[52] would favor the creation of simpler access systems in provider countries, because existing control mechanisms would be applied, via the certificate, in the later stages of research and development, thus helping to make the regulations on access to genetic resources more flexible. In this way, monitoring and regulation would be less strict during the access phase and stricter during the research and development phase, where control or check points would be established. This implies that the documentation would need to pass through the various buyers, but the monitoring points would be reserved only for certain milestones in the research and development process, such as those related to product approval, IPR applications, publications, the presentation of funding proposals, etc.

Many aspects still need to be clarified before this system can become operational, including:

1. The designation of national authorities to issue certificates that are mutually recognized.
2. The identification of conditions for verification of and compliance with the certificates, that is, the determination of which materials they would apply to, for what purposes, and at what moment or stage they would be verified.
3. Exemptions.
4. Provisions for cases in which it is not possible to identify the origin of the genetic resources, including benefit-sharing.
5. Differential treatment of different sectors.
6. Dispute settlement mechanisms.
7. The creation of an international certificate register.
8. How countries that are not parties to the IR will be handled.
9. Provisions related to the resources contained in ex-situ collections prior to the Convention. [53]

Other aspects of interest could include:

1. What the certificate corresponds to: species, genes, specific biological samples, etc.
2. Transaction costs of the certificate.
3. Different types of certificates: origin, legal provenance, source.
4. Characteristics of the system: simplicity, flexibility, avoidance of complex procedures.
5. Considerations regarding the product supply chain, etc.
6. Ability to comply with the objectives of the CBD, especially conservation.
7. Economic impacts and implications of the certificate for different actors (botanical gardens, etc.).
8. Content of the certificate.
9. Sanctions for non-compliance.
10. Lack of legislation on access.
11. Procedures for control and use of the Clearing House.
12. How to ensure that additional barriers are not created for the non-commercial exchange of resources.
13. Compatibility with international trade regimes,[54] etc.

Depending on the certificate's final design, some rules of the trade system might apply to it, especially those related to technical barriers to trade. For instance, if the certificate is going to be checked at customs and if the legal consequences of not producing a certificate are the prohibition of the entry of the genetic resources—for which the certificate should have been issued—into a country. However, the potential implications of such rules on the certificate need to be better understood.

With regard to the compliance component of the IR, the Annex of Decision IX/12 identified as an area for "further elaboration" the "Development of tools to monitor compliance: . . . b) (an) internationally recognized certificate issued by a domestic competent authority."[55] The Draft Protocol provides that the:

> disclosure requirement shall be met by providing *bona fide* evidence that a permit or certificate was granted at the time of access in accordance with Article 5, paragraph 1 (d);
>
> The permit or certificate issued at the time of access in accordance with Article 5, paragraph 1 (d) and registered with the ABS Clearing House Mechanism, in accordance with Article 5 paragraph 2 shall constitute an internationally recognised certificate of compliance. The internationally recognised certificate of compliance shall serve as evidence that the genetic resource in question has been obtained, accessed and used in accordance with prior informed consent and that mutually agreed terms have been entered into, in accordance to national legislation on access and benefit-sharing of the country providing the genetic resource. Disclosure requirements shall be met by providing an internationally recognised certificate or permit. The internationally recognised certificate of compliance shall contain the following minimum information:
>
> a) Issuing national authority;
> b) Details of the provider;
> c) A codified unique alpha numeric identifier where feasible;
> d) Details of the rights holders of associated traditional knowledge, as appropriate;
> e) Details of the user;
> f) Subject-matter covered by the certificate;
> g) Geographic location of the access activity;
> h) Link to mutually agreed terms;
> i) Uses permitted and restrictions of use;
> j) Conditions of transfer to third parties if any;
> k) Date of issuance.
>
> The Conference of the Parties serving as the meeting of the Parties to this Protocol shall consider additional

modalities of the internationally recognized certificate of compliance system, taking into account the need to minimize transaction costs and to ensure feasibility, practicality and flexibility.[56]

The certificate can contribute to the monitoring and traceability of genetic resources. It appears to have some degree of support, at least regarding an analysis of this proposal to determine whether it should be included in the Regime and, if so, how this should be accomplished. The certificate could be required in patent applications to provide evidence of compliance with national legislation on ABS, including prior informed consent and benefit sharing, thus fulfilling a role in supporting the disclosure of origin requirement.

CBD COP Decision VIII/4C established an Expert Group ("EG") on an internationally recognized certificate of origin/source/legal provenance.[57] The Group agreed that the basic role of any certificate system would be to provide evidence of compliance with national ABS legislation. This could be achieved by a system of national certificates with standard features to allow for their international recognition.

The Group[58] identified a number of points common for all proposals of a certificate, including that it could be required for presentation at specific checkpoints in the user countries, *inter alia* patent and in general IP applications.[59] Indeed, the certificate of origin could perhaps be integrated into the existing system of requirements for disclosure of information in the patent system. A majority of certificate proposals envisage a system of checkpoints at which disclosure of the certificate of origin would be required for the purposes of processing IP applications, among other things. Compliance with disclosure requirements would be facilitated where an internationally recognized certificate could act as evidence of conformance with national and international law.[60]

However, the certificate, depending on its design, may raise other international trade issues. Some rules of the trade system might apply to it, especially those related to technical barriers to trade. In this regard, considering that the certificate could be a document attached to the transfers/export (international trade) of genetic resources it also should be analyzed in the context of the relevant rules of the WTO regarding non discrimination (the Most Favored Nation Principle and the National Treatment Principle) as well as the appropriate measures contained in the Agreement on Technical Barriers to Trade ("TBT"), which governs the elaboration and use of technical regulations, standards, and conformity assessment procedures in a way that do not create unnecessary obstacles to international trade. The certificate could be considered a technical regulation and it must take into account the relevant provisions of the TBT Agreement, especially article 2.2: technical regulations shall be no more restrictive than necessary to fulfill a legitimate objective and the requirement that technical measures shall be the less trade restrictive in light of applicable risks.[61]

- Technology transfer as an element of the benefit-sharing component of the IR.

Annex I to Decision IX/12, under section III. B. on "Fair and equitable benefit-sharing" also includes as a component to be further elaborated, the access and transfer of technology. A technology transfer measure could be developed in the context of the benefit sharing component of the IR.[62] The Draft Protocol provides (article 18 bis) that:

> In accordance with Articles 15, 16 and 19, Parties shall collaborate, cooperate and contribute in scientific research and development programmes, particularly biotechnological research activities, as a means to generate and share benefits in accordance with Article 4 of this Protocol. This shall include measures by developed country Parties that provide incentives, to companies and institutions within their jurisdiction, to promote and encourage access to technology by, and transfer of technology to, developing countries, including the least developed among them, in order to enable them to create a sound and viable technological base. Where possible, such collaborative activities shall take place in the country providing genetic resources.[63]

It is outside the scope of this article to analyze the relationship between IPRs in general, and TRIPS in particular, and technology transfer in the context of the CBD. However, it is clear that technology transfer is a key element of the ABS CBD provisions[64] and of the IR. As one study has pointed out "The provisions of the Convention on technology transfer reflect the consensus of the international community laid down in key international policy documents, that the development, transfer, adaptation and diffusion of technology and the building of capacity is crucial for achieving sustainable development."[65] For instance, technology transfer could be one element of structuring mutually agreed terms and benefit sharing arrangements.

At the same time, transfer of technology (e.g. protected by IPRs) may create some links between the IR and TRIPS provisions on this matter.[66]

Factual Overview of Relevant Provisions/Developments/Processes at UPOV[67]

The International Convention for the Protection of New Varieties of Plants was signed in Paris in 1961 and entered into force in 1968. It was revised in 1972, 1978, and 1991. The 1991 Act of the UPOV Convention entered into force in 1998. The purpose of the UPOV Convention is "to ensure that the members of the Union acknowledge the achievement of breeders of new varieties of plants, by granting to them an intellectual property right, on the basis of a set of clearly defined principles."[68] Thus, the Convention provides a *sui generis* form of intellectual protection specifically adapted to the process of plant breeding and developed with the aim of encouraging breeders to develop new varieties of plants. To be eligible for protection, varieties have to be: (i) distinct from existing, commonly known varieties; (ii) sufficiently uniform; (iii) stable; and, (iv) new in the sense that they must not have been commercialized prior to certain dates established by reference to the date of the application for protection.[69] The Convention offers protection to the breeder,

in the form of a "breeder's right," if his plant variety satisfies the above conditions. The scope of the breeder's right is, however, limited by two important exceptions in Article 15. The first exception, known as the "breeder's exemption" allows the use of the propagating material of the protected variety, without prior authorization, for the purpose of breeding other varieties. The breeder's exemption optimizes variety improvement by ensuring that germplasm sources remain accessible to all breeders. The second exception concerns the right of farmers to use farm-saved seed for replanting. This is known as the "farmers' privilege" and seeks to safeguard the common practice of farmers saving their own seed for the purpose of re-sowing.[70] However, the Convention requires that the farmers' privilege be regulated "within reasonable limits and subject to safeguarding of the legitimate interests of the breeder." As of August 1, 2004, 55 States were a Party to the UPOV Convention. The mission of UPOV is "to provide and promote an effective system of plant variety protection, with the aim of encouraging the development of new varieties of plants, for the benefit of society."[71]

- Relationship to access and benefit-sharing

In response to notifications by the Executive Secretary inviting relevant international organizations to contribute to the work on access and benefit-sharing, the Vice Secretary-General of UPOV provided detailed replies highlighting the access and benefit-sharing aspects of the UPOV Convention. The UPOV submission is included in the compilation of submissions by Parties, international organizations, and other relevant stakeholders.[72]

In these communications, UPOV highlighted the importance of access to genetic resources to ensure progress in plant breeding. It also pointed to the concept of the breeder's exemption in the UPOV Convention which reflects the view of UPOV that the worldwide community of breeders needs access to all forms of breeding material to sustain progress in plant breeding and hence maximize the use of genetic resources for the benefit of society. The communications also include reference to the inherent benefit-sharing principles of the UPOV Convention, in the form of breeder's exemption and other exceptions to the breeder's right. Concern is expressed with respect to any other measures for benefit-sharing that could introduce unnecessary barriers to progress in breeding and the utilization of genetic resources. Finally, UPOV urges the Working Group on Access and Benefit-Sharing to recognize these principles in its work and to ensure that any measures it develops are supportive of these principles and of the UPOV Convention.

UPOV is of the opinion that the Convention on Biological Diversity and the UPOV Convention should be mutually supportive and the international regime on access to genetic resources and benefit-sharing should be designed so that the mutual supportiveness of the UPOV Convention and the CBD will not be affected. The views of UPOV with respect to the work of the Working Group on Access and Benefit-Sharing, adopted by the Council of UPOV at its thirty-seventh ordinary session on October 23, 2003, were provided to the Secretariat prior to the second meeting of the Working Group. These views provide a useful overview of issues related to the international regime from the perspective of UPOV.[73]

A further contribution was provided by UPOV in preparation for the fourth meeting of the Working Group on Access and Benefit-Sharing and was made available in a document that highlights that the UPOV Convention is not an instrument relating to access and benefit-sharing.[74] As further detailed in the UPOV contribution, it was requested that "consideration is made that any measures pursued in the international regime do not undermine plant variety protection according to the UPOV Convention. For its part UPOV supports the view that the Convention on Biological Diversity and relevant international instruments dealing with intellectual property rights, including the UPOV Convention, should be mutually supportive."[75]

UPOV has also prepared a study[76] on the impact of plant variety protection and its report is now available on UPOV's website. The study indicates that "the UPOV system of plant variety protection provides an effective incentive for plant breeding in many different situations and in various sectors, and results in the development of new, improved varieties of benefit for farmers, growers and consumers" and that "farmers, growers and breeders have access to best varieties produced by the breeders throughout UPOV member territories."[77]

The position of the UPOV Council on access to genetic resources and benefit-sharing related to plant breeders' rights ("PBR") (adopted by the UPOV Council in its thirty-seventh session, on October 23, 2003), mentioned above, needs to be briefly presented here to fully understand the options and scenarios.

Access to genetic resources: "UPOV considers that plant breeding is a fundamental aspect of sustainable use and development of genetic resources. It is of the opinion that access to genetic resources is a key requirement for sustainable and substantial progress in plant breeding. The concept of the "breeders' exemption" in the UPOV Convention, whereby acts done for the purpose of breeding other varieties are not subject to any restriction, reflects the view of UPOV that the worldwide community of breeders needs access to all forms of breeding material to sustain greatest progress in plant breeding, and thereby, to maximize the use of genetic resources for the benefit of society."[78]

Disclosure of origin: ". . . UPOV encourages information on the origin of the plant material, used in breeding of the variety, to be provided where this facilitates the examination [for compliance with the conditions of protection], but could not accept this as an additional condition of protection since the UPOV Convention provides that protection should be granted to plant varieties fulfilling the conditions of novelty, distinctness, uniformity, stability and a suitable denomination and does not allow any further or different conditions for protection . . . . Thus, if a Country decides, in the frame of its overall policy, to introduce a mechanism for the disclosure of countries of origin or geographical origin of genetic resources, such a mechanism should not be introduced in a narrow sense, as a condition for plant variety protection. A separate mechanism from the plant variety legislation, such as that used for phytosanitary requirements, could be applied uniformly to all activities concerning

the commercialization of varieties, including, for example, seed quality or other marketing related regulations"[79]

Prior Informed Consent: ". . . UPOV encourages the principles of transparency and ethical behaviour in the course of conducting breeding activities and, in this regard, the access to the genetic material used for the development of a new variety should be done respecting the legal framework of the country of origin of the genetic material. However, the UPOV Convention requires that the breeder rights should not be subject to any further or different conditions than those required to obtain protection. UPOV notes that this is consistent with article 15 of the CBD, which provides that the determination of access to genetic resources rests with the national governments and is subject to national legislation. . . ."[80]

Benefit-sharing: "UPOV would be concerned if any mechanisms to claim the sharing of revenues were to impose an additional administrative burden on the authority entrusted with the grant of breeder's rights and an additional financial obligation on the breeder when varieties are used for further breeding. Indeed, such an obligation for benefit sharing would be incompatible with the principle of the breeder´s exemption established in the UPOV Convention whereby acts done for the purpose of breeding other varieties are not, under the UPOV Convention, subject to any restriction and the breeders of protected varieties (initial varieties) are not entitled to financial benefit sharing of varieties developed from the initial varieties, except in the case of essentially derived varieties. . . ."[81]

Access and PBR: The legislation on access to genetic material and the legislation dealing with the grant of breeders' rights pursue different objectives, have different scopes of application, and require a different administrative structure to monitor their implementation. Therefore, it is considered appropriate to include them in different legislation, although such legislation should be compatible and mutually supportive.[82]

Later, the UPOV Council, at its twenty-fifth extraordinary session held in Geneva on April 11, 2008, decided to request the COP IX to include in the IR decisions the following paragraphs: "Recognizing that UPOV supports the view that the Convention on Biological Resources and the UPOV Convention should be mutually supportive" and "Further Instructs the Ad-hoc Open Ended Working Group on Access and Benefit Sharing that any provisions which it develops for an international regime on access and benefit sharing should ensure mutual supportiveness with the UPOV Convention."[83]

The Relationships between UPOV and the IR

UPOV has a direct relevance for the sustainable use of plant genetic resources and for the CBD objectives. However, in the light of the current IR negotiations, the most relevant issues connecting the IR and UPOV are the disclosure of origin/certificate and its relationship with UPOV provisions, and the technology transfer measures related to Plant Breeders Rights. A potential disclosure requirement/check point for the certificate would be the plant breeders' right applications,[84] but UPOV is of the opinion that this could not be an additional condition of protection. Also TT provisions to be included in the IR could be related to Plant Breeders' Rights.

It does not seem that the current IR components as set forth in Annex to Decision IX/12 or in the Draft Protocol could negatively impact the basic principles of UPOV, including the freedom to use developed varieties that are protected solely by PVP for further breeding without the consent of the breeder (the breeder exemption),[85] except for the issue of disclosure of origin drafted as a condition for protection. However, depending on the form of any future amendments or recommendations and resulting obligations, there may still be the potential to impact UPOV principles.

Options and Scenarios

The IR and the WTO

There are three relevant aspects of the IR which may have an impact on the WTO rules: the disclosure of origin; the certificate of compliance; and technology transfer. The following paragraphs explore the different scenarios and options.[86] It should be pointed out again that the current text of the Draft Protocol is entirely open to further negotiations and nothing of its content can be considered agreed.

- Disclosure requirements/certificate of compliance developed in the CBD IR negotiations and its relationship to the WTO provisions.

The inclusion and discussion of disclosure requirements and the use of the certificate in patent applications have both been contentious issues during the IR negotiations.[87] However, one potential scenario would be the inclusion of some form of disclosure requirement in the IR negotiations. In this regard, it has been suggested that the inclusion of mechanisms such as the disclosure of origin of genetic resources and traditional knowledge, or the certificate in patent or other IPR filing procedures as proposed, would strengthen mutual supportiveness between the WTO's IPR system and the CBD ABS IR. Due to the nature of a legally binding instrument of the ABS Protocol, the countries should develop—in their national legislation—disclosure of origin requirements to comply with the international obligations. While there may be some variances with regard to the scope, consequences, and practical operations of these requirements, some experts agree that[88] in general the requirements of disclosure do not run counter to the international IP agreements (with regard to the UPOV Convention, see paragraph 78) and the TRIPS agreement in particular.[89] In addition, there are ongoing negotiations regarding disclosure at the WTO and no final decision has been made yet whether or not to accept the disclosure requirements in the TRIPS Agreement.

Alternatively, a "soft version" of the disclosure could also be developed at the CBD to encourage the adherence of some countries that are already opposed to disclosure requirement (both in the WTO and the CBD).[90] However, some delegations and stakeholders do not support any disclosure requirements in IP applications, and support alternative mechanisms to address concerns regarding misappropriation. In their view, new patent disclosure requirements will be ineffective in promoting the objectives sought and will introduce uncertainties into the patent system.

Under this scenario (the development of disclosure requirements in the IR), the IR negotiations could promote more clarity on relevant issues, such as the meaning and implications of prior informed consent ("PIC") and benefit-sharing requirements. Some of the objections to the disclosure provisions are related to the lack of clarity about the exact scope and the legal implications of the terms used. A number of terms and concepts that are central to the ABS regime, such as "fair and equitable benefit sharing," "traditional knowledge," and "access to genetic resources" are not defined in the CBD. The definition of terms is an ongoing process in the CBD and was included in the mandate of prior ABS Working Group meetings.[91] The IR could clarify issues of PIC, benefit-sharing, certificate of origin, etc. It also could offer guidance on key topics, such as the scope of the terms "genetic resource" and "biological resource."

This scenario would present two main disadvantages: the condition of non-CBD Party United States, a relevant IP country, and difficulties for the integration of the disclosure requirements into the IP system if the provisions would be integrated in the CBD.[92]

In relation to the certificate, the IR could provide the necessary practical and operational details for its use in IPR applications. The certificate as such has not been discussed at the WTO, but the development of appropriate provisions on the certificate under the IR could facilitate the use of the certificate for disclosure of origin purposes. It is clear that the certificate has a broader scope and objectives than merely serving as an instrument to promote disclosure.[93] However, a certificate system that serves merely to demonstrate compliance with the requirements of the laws of the providing country, and a legal title to use of the resources and identify the rights and limitations attached to the access and use, would not appear to run counter the WTO rules. It would depend on how the certificate, if agreed, is finally designed. The certificate, if it is designed in a non discriminatory fashion, could be in harmony with the trade system and both instruments could be developed in a mutually supportive manner.

- Disclosure of origin/source at the WTO.

A different scenario is the incorporation of disclosure provisions at the WTO (in this case through a legally binding amendment to the TRIPS Agreement). The exact scope and precise content of a potential amendment of the WTO is still uncertain (whether or not sanctions for non-compliance will be outside the patent law or not; the necessity of proving compliance with PIC and benefit-sharing; etc) as well as the amendment *per se*. This scenario would also create mutual supportiveness between the IPR system of the WTO and the CBD ABS IR.

In addition, under this scenario the disclosure could contribute to the "defensive protection" [94] of traditional knowledge ("TK), therefore supporting the TK component as well as the compliance component under the IR. Requirements for disclosure of the origin of traditional knowledge associated with genetic resources may assist in ensuring prior informed consent and equitable benefit-sharing with regard to both traditional knowledge and the associated genetic resources.

Considering the large membership of the WTO and its economic relevance for the Contracting Parties, this amendment would promote a better and wider integration of the disclosure of origin in the IP system (and in the national laws) and would promote broad implementation of the instrument. In this case, the CBD may provide assistance and coordination in developing and implementing disclosure requirements by clarifying terms and instruments, including the certificate role in the disclosure. A reference and description of the disclosure mechanism in the context Protocol could also be established, but the substantive provisions would be integrated into the TRIPS agreement.

The effective implementation of the international regime will demand input and collaboration from a range of organizations and fora to ensure that all cross-sectoral issues are given due consideration and effect.

- No disclosure requirements in either instrument.

Another scenario would be the absence of disclosure requirement provisions in both the CBD IR and in the WTO. In this case there will be no conflict between the IR and WTO, but, in the view of some countries and experts, an opportunity to promote mutual supportiveness between the WTO IPR system and the CBD ABS IR could be lost. However, some countries and stakeholders support this approach because it would avoid the alleged negative consequences of new patent disclosure requirements mentioned before. These delegations and stakeholders support other mechanisms to address concerns regarding misappropriation.

- Technology transfer provisions developed in the IR

Technology transfer provisions could be specifically developed in the context of the IR benefit sharing component in line with the current provisions and language of the CBD itself. This actually has been included in the current Draft Protocol (article 18 bis).[95]

However, considering that the current text is open for negotiations, TT provisions could end up in different forms in the final version of the Protocol. The IR could set minimum requirements for benefit-sharing to be included in the mutually agreed

terms, including TT. Technology transfer measures could also be developed as a direct obligation for CBD Members. These provisions could be similar to the ones already included in the CBD (articles 15, 16, and 19).[96]

Both types of provisions could be drafted to be in harmony and provide mutual supportiveness between the IR and the WTO/TRIPS IPR provisions.[97] These measures would be compatible and mutually supportive of the WTO efforts and text regarding technology transfer, including the Doha Mandate (par. 19).[98]

The IR and UPOV

Despite the UPOV Council position on the IR and the UPOV Convention, some authors are of the opinion that a disclosure of origin requirement does not necessarily conflict with UPOV basic rules.[99] At the same time, there are no known initiatives within UPOV to modify the UPOV Convention for the inclusion of disclosure requirements. With regard to the WTO discussions on disclosure, these take place in the context of the patent system and would not affect PBR protection.[100]

- Disclosure/certificate requirements established for PBR in the IR[101]

For these reasons, a potential option to include the disclosure of origin in PBR as a result of the CBD IR negotiations could conflict with the UPOV interpretation of the compatibility between the disclosure requirements and UPOV conditions for protection,[102] if the disclosure requirements were drafted as an additional condition for protection.

Due to the fact that the IR negotiations outcome on disclosure is to be contained in a legally binding instrument, a potential inconsistency between the two agreements would exist. Such an approach could be a disincentive for the UPOV members to become Parties to the legally binding IR.

Another option is to amend the UPOV Convention to include a disclosure of origin condition for the protection of Plant Breeders' Rights. However, there is no information that such a process has been suggested by UPOV members.

- Exclusion of PBR from the disclosure/certificate or an alternative drafting

One option is to exclude PBR applications from the disclosure provisions or to create a different and special system, taking into account both the legal and technical implications of such system for the case of plant varieties. A special disclosure requirement could be designed taking into account the legal requirements and conditions established in the UPOV Convention and the process of the access and use of plant genetic material for the breeding of new varieties.

- Technology transfer provisions and UPOV

There are not specific technology transfer provisions as such in the UPOV Convention. However, similar arguments and conclusions to the ones presented in the WTO section could be made with regard to TT provisions developed in the IR and UPOV.[103] The IR could establish TT provisions related to plant variety protection, which could co-exist in harmony and be mutually supportive of the UPOV Convention.

- IR statement on mutual supportiveness with the UPOV Convention

UPOV Council statements have called repeatedly for mutual supportiveness between both instruments. In addition, references to UPOV in the current IR negotiating text are found under some of the options for the IR Scope. One possible option is to expressly include a reference to the mutual supportiveness between the UPOV Convention and the IR. However, it could be objected to on the grounds that similar statements could also be made for many other international instruments and processes.

Conclusion

There is a lot of space to strengthen mutual supportiveness between the IR outcome and the WTO, WIPO, and UPOV processes and instruments. In principle, the IR Protocol, could co-exist in harmony with the other treaties or processes, taking into account the arguments and options presented in this article.

The calls for mutual supportiveness between the CBD, WTO, WIPO, and UPOV regimes can be read as implying the need to make compatible multiple regimes with very different objectives, approaches, and values demanding and claiming legal protection.[104]

The effective implementation of the international regime will demand input and collaboration from a range of organizations and fora to ensure that all cross-sectoral issues are given due consideration and effect.[105] Therefore, it is important to foster closer co-operation and co-ordination between the processes of the WTO and UPOV and the Convention IR negotiations in order to better capitalize on potential synergies between the prospective international regime on ABS and the IP system.

Endnotes: The Relationship Between the Access and Benefit Sharing International Regimen and Other International Instruments the World Trade Organization and the International Union for the Protection of New Varieties of Plants

1 U.N. Convention on Biological Diversity art. 15(1), June 5, 1992, 1760 U.N.T.S. 79, *available at* http://www.cbd.int/convention/convention.shtml.
2 *Id.* art. 1.
3 *Id.* art. 15(7).
4 *Id.* art. 15(4), (5).
5 *Id.* art. 8(j).
6 Sixth Ordinary Meeting of the Conference of the Parties to the Convention on Biological Diversity, the Hague, Neth., Apr. 7-19, 2002, *Access and benefit-sharing as related to genetic resources*, U.N. Doc. UNEP/CBD/COP/DEC/

Endnotes: The Relationship Between the Access and Benefit Sharing… *continued on page 50*

Using REDD to Promote Biodiversity-Sensitive Forest Fire Management Schemes

*by Alex Hoover**

Fire is an integral element of healthy forest ecosystems.[1] Many plant and animal species naturally rely on fire to make room for new growth, encourage reproduction, and provide vital nutrients.[2] However, overly frequent or intense fires can inhibit a forest ecosystem's ability to rehabilitate, impoverishing the ecosystem's biodiversity.[3] In many cases, human activities disrupt natural fire frequency or intensity.[4]

At an international level, there is an institutional awareness of the nexus between forest fire management and biodiversity.[5] At a national level, however, fire management schemes are fragmented, overly complex, or lacking specificity, making it difficult to manage fire responsibly.[6] To bridge this gap, the international community should use funding mechanisms like the United Nations Reducing Emissions from Deforestation and Forest Degradation Program ("REDD") to encourage the implementation of biodiversity-sensitive forest fire management schemes. This article provides a brief explanation of fire's role in maintaining forest biodiversity and makes specific recommendations on how REDD can encourage better forest fire management.

Fire's effect on forest biodiversity varies depending on the type of forest, its intensity, and the frequency with which fires occur.[7] Semi-regular, low-intensity fires can have positive impacts on biodiversity in all types of forests. In temperate forests, many plant and animal species are dependent on regular fires of low intensity.[8] Studies show that aggressive fire suppression in North America caused a decline in grizzly bear populations, a result of fewer fire-dependent, berry-producing shrubs that support bear populations.[9]

In boreal forests, fire is an important mechanism to clear biomass from the forest floor.[10] A build-up of organic material due to fire suppression in boreal forests can prevent the melting of permafrost.[11] As a result, the forest maintains a thick layer of permafrost that impoverishes the soil and decreases productivity of plants.[12]

Tropical forests can also benefit from fire.[13] Some studies suggest that fire in tropical forests can increase the size and diversity of small animal populations.[14] Similarly, certain tree species in Southeast Asia exhibit fire-resistant traits, such as thick bark, an ability to heal fire scars, and re-sprouting.[15] The presence of regular, low-intensity fires during dry seasons can promote these fire-resistant traits and reduce the threat of larger forest fires in the long-term.[16]

On the other end of the scale, frequent or high-intensity fires are destructive across all forest types.[17] A boreal forest's ability to regenerate after a forest fire is limited by high intensity fires.[18] Severe fires in Russia's forests in 1998 destroyed the "ecological function" of roughly 2 million hectares of forest.[19]

In tropical forests, areas subject to frequent fires because of human activity like logging are more vulnerable to fires in the future.[20] Recurring fires can also reduce the size and density of surviving forest patches and can kill regenerating plant species.[21] The risk of forest fires is exasperated by slow rehabilitation in tropical forests, where as long as seventy years are necessary to recover from even moderately destructive fires.[22]

To promote fire management schemes that allow for natural fire cycles, the international community should encourage the use of biodiversity-sensitive practices through REDD. Very generally, REDD is an effort to prevent the degradation of forests as carbon sinks through national cooperation and financing.[23] To achieve this goal, REDD provides financing to developing nations in exchange for preservation of forests.[24] In its "REDD Plus" Program, the UN expands the scope of REDD to include sustainable management, conservation, and forest enhancement.[25] As world leaders seek to expand REDD to play a more active role in curbing global climate change,[26] they should prioritize maintaining biodiversity.

Current REDD projects in Brazil take into account biodiversity issues and briefly address the need to properly manage fire.[27] Within the context of the Amazon there are few benefits to fire, so a "no-burn" policy is appropriate. In fire-dependent forest ecosystems, a more nuanced approach is necessary. If REDD projects fail to adequately consider fire's role in maintaining biodiversity, they may incentivize the suppression of a forest's natural fire cycle.[28]

To avoid the risk of perverse incentives, REDD Project financing should promote biodiversity-sensitive fire management in member nations. Once proper management is in place, payments for forest preservation could be timed in a manner that recognizes the natural destruction and rehabilitation seen in regular fire cycles. Under such a system, a REDD Project would avoid situations in which nations were penalized with reduced funds because forests were allowed to naturally burn.

Too often, human activities such as fire suppression and land-use changes disrupt natural fire cycles, causing a decline in biodiversity. The international community should use financial mechanisms such as REDD to promote biodiversity-sensitive fire management schemes.

Endnotes: Using REDD to Promote Biodiversity-Sensitive Forest Fire Management Schemes *continued on page 53*

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Getting on the List:

Politics and Procedural Maneuvering in CITES Appendix I and II Decisions for Commercially Exploited Marine and Timber Species

*by Melissa Blue Sky**

Introduction

In this, the International Year of Biodiversity, the fifteenth Conference of the Parties ("COP-15") of the Convention on International Trade in Endangered Species of Wild Fauna and Flora ("CITES" or "Convention") will likely be remembered most for those species that it failed to provide protection for—the polar bear, coral, sharks, and most notably the bluefin tuna.[1] International trade in wild species has been valued at an estimated $240 billion annually and CITES seeks to ensure, through international cooperation, that this trade does not unduly threaten the survival of wild species.[2] Despite increased consideration of proposals to regulate trade in commercially valuable species since CITES COP-12 in 2002, any past trends in their acceptance are waning.[3]

Around eighty percent of the value of annual international trade in wild fauna and flora consists of trade in fisheries and timber.[4] That none of the six proposals to include marine species, a number of which had been proposed for listing at prior COPs, were ultimately accepted at COP-15[5] illustrates the fundamental tension in listing decisions between parties who believe that CITES should be part of the long-term sustainable management of species and those who consider it a last resort to prevent species extinction. Decisions on whether to provide protection for commercially exploited species often have more to do with economics than with science, underlining the inherent challenge of the Convention: species that are in most need of protection from trade are least likely to get listed because of high levels of demand.

This article examines the opportunities and challenges for protecting biodiversity of economically important species through inclusion in CITES,[6] first providing an overview of CITES and its provisions for adding species to Appendices, including the revised listing criteria and the new role of the United Nations Food and Agriculture Organization ("FAO") in COP listing decisions. The next section will focus on COP-15 listing debates, procedural maneuvering, and votes, in the context of scientific evidence and listing proposals for the Atlantic bluefin tuna, several shark species, pink and red coral, and two timber species. Proposals to increase the possibilities for inclusion of commercially exploited species in CITES include measures to strengthen the CITES Secretariat, build coalitions, take livelihood concerns into consideration, amend the relationship between CITES and FAO, and increase responsibilities for importing countries. Finally, this article considers alternative actions for protecting threatened species from overexploitation through trade, such as through Regional Fisheries Management Organizations ("RFMOs") or enacting unilateral trade bans justified under Article XX of the General Agreement on Tariffs and Trade ("GATT").

Overview of CITES and Listing Criteria

CITES regulates international trade in wild species, which includes "export, re-export, import and introduction from the sea," through permitting and certification.[7] Based on an initial proposal from the International Union for Conservation of Nature and signed by eighty countries in 1973, CITES currently has 175 members.[8] CITES was initially concerned with a small subset of animals used in the fashion industry, such as leopards, elephants, and alligators, but today covers the international trade of over 5,000 animal and 28,000 plant species with myriad uses.[9]

Trade in wild fauna and flora is regulated for those species included in CITES Appendices I, II, and III. Appendix I includes "all species threatened with extinction which are or may be affected by trade."[10] Trade in species listed in Appendix I is prohibited, except under very limited circumstances for non-commercial purposes.[11] Species listed in Appendix II may either be a species that while not currently threatened by trade, risks becoming so if trade continues unregulated or a so-called "look alike" species, which is included to ensure the effectiveness of trade regulation for species listed in either Appendix I or II.[12] Trade certification provisions for Appendix II species include approval of an export permit by both importing and exporting nations and a determination that the export of the species "will not be detrimental to the survival of that species."[13] Appendix III includes species that are regulated within the jurisdiction of a country that needs international cooperation to control trade, and contains limited permit requirements.[14] Of the more than 33,000 species included in CITES, the majority are listed in Appendix II, with less than three percent listed in Appendix I and less than one percent in Appendix III.[15]

Member countries are required to designate a Management Authority and Scientific Authority,[16] whose responsibilities include reviewing species and authorizing trade in species listed in the Appendices.[17] Parties are also responsible for enforcing the regulations set forth in the Convention, but may make

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reservations with regard to specific species listed in Appendix I, II, or III.[18] Countries with reservations in the same listed species may thus trade with one another or with non-parties to the Convention and do not have to abide by CITES regulations for that particular species.[19]

Listing Procedures

Species may be added to Appendix I or II either through an affirmative vote of two-thirds of all the members present and voting at a COP, or between COPs by a two-thirds majority only if votes are received from at least half of the parties.[20] Abstentions are not counted in the determination of the two-thirds majority.[21] For consideration of a proposal at a COP the party proposing the amendment must submit it to the CITES Secretariat at least 150 days before the meeting.[22] The Secretariat must consult with other parties and interested bodies, provide the text to the parties[23] and, in the case of marine species, consult with relevant intergovernmental organizations for all proposals.[24]

A party may make unilateral additions to Appendix III by notifying the CITES Secretariat of the species subject to regulation within the party's jurisdiction.[25] A party may submit a reservation for an Appendix III species at any time.[26] A listing country may also withdraw a species from Appendix III at any time.[27]

Listing Criteria

At COP-9 in 1994 CITES members recommended that the guidance for adding species be reviewed and revised before COP-12 in 2002.[28] The listing criteria used for proposals to COP-15 was again amended at the 12th, 13th, and 14th COPs.[29]

To be listed in Appendix I, a species must meet one of three biological criteria to be considered threatened with extinction for the purposes of CITES.[30] The biological criteria are: a small population; a limited geographic area of distribution; or a significant reduction in population, each of which must be coupled with at least one additional factor that may contribute to decline of the species.[31]

To be listed in Appendix II a species must either be in danger of meeting the criteria for inclusion in Appendix I if trade is not regulated, or regulation of harvesting is needed to ensure that the survival of the species is not threatened.[32] In addition, for the listing of "look alike" species in Appendix II, the traded form must resemble an Appendix II listed species, be similar enough to an Appendix I species that an enforcement officer would be "unlikely to be able to distinguish between them," or be otherwise necessary to regulate trade in a listed species.[33]

Moreover, the listing criteria notes that the conditions for listing species in either Appendix I or II must be read in conjunction with the definition for "decline," particularly with regard to commercially exploited marine species.[34] Definitions are prefaced with a statement that numerical guidelines are illustrative, as no range will apply to all species.[35] Nevertheless, for a species to be considered in long-term decline the population will generally be between five and thirty percent of the baseline, and in the case of aquatic species the population will be between five and twenty percent of the baseline.[36] Decline can also be measured by the recent rate of decline, which is a reduction of fifty percent or more in the past ten years or three generations, or a reduction of twenty percent or more in the last five years or two generations for species with low productivity.[37]

CITES was initially concerned with a small subset of animals used in the fashion industry, such as leopards, elephants, and alligators, but today covers the international trade of over 5,000 animal and 28,000 plant species with myriad uses.

Role of FAO in Listing

Since COP-14 FAO has played a major role in the listing debates and decisions related to aquatic species.[38] Although the Convention requires the Secretariat to consult relevant intergovernmental bodies for marine species listing proposals,[39] the terms of the consultation with FAO were expanded and formalized in a 2006 Memorandum of Understanding ("MoU") between CITES and FAO.[40] A provision of the MoU specifically related to listing proposals states that "the CITES Secretariat will respect, to the greatest extent possible, the results of the FAO scientific and technical review of proposals to amend the Appendices."[41]

CITES and FAO expert panel listing recommendations conflicted on four of the seven marine species proposals at COP-14, with many members disagreeing with FAO's opposition to listing coral and shark species.[42] FAO also opposed listing a number of the proposed marine species at COP-15, as discussed in more detail below.[43] Moreover, parties at COP-15 applied FAO recommendations inconsistently and did not follow any of the FAO expert panel recommendations in favor of listing, indicating that politics may trump science in determining whether to include a species in Appendix I or II.[44]

Analysis of COP-15 Proposals, Debate, and Listing Decisions

All marine species listing proposals at COP-15 were rejected after contentious debate, but both timber species—rosewood and holy wood—were approved by consensus for listing

in Appendix II. In contrast, at recent COPs some marine species have been listed, while a number of timber proposals have met with considerable opposition. Commercially significant species listed at COP-12 and COP-13 included seahorses, basking whale and great white sharks, mahogany, and ramin.[45] Out of the eleven proposals on marine and timber at COP-14 only Brazil wood, sawfish, and eel species were listed.[46]

Forty-two Appendix I and II amendment proposals for species were considered at COP-15, including downlisting of certain species, removal of certain species, and addition of species to both Appendices.[47] Although decisions on species ranging from elephants to a newt are of utmost importance in the realm of biodiversity and international trade, the scope of this article includes only proposals to list commercially exploited timber and marine species, which were either approved or rejected.

Arguments gaining traction at COP-15 listing debates—discussed in more detail in sections below—include: parties questioning CITES jurisdiction, economic and livelihood concerns, and opinions of insufficient or flawed scientific data.[48]

Economic and livelihood concerns now play an important role, either overtly or covertly, in the decision of whether to include a species in a CITES Appendix.

Atlantic Bluefin Tuna

Outside of CITES debates there exists a near unanimous agreement that the situation of the Atlantic bluefin tuna is dire.[49] Commercial fishing of the species only began in the 1970s,[50] but the stocks have fallen to just fifteen percent of their total before fishing began.[51] Although around eighty percent of the total bluefin tuna catch is consumed in Japan, European and other Mediterranean countries harvest much of the Atlantic bluefin.[52]

The International Commission for the Conservation of Atlantic Tunas ("ICCAT") has woefully mismanaged the Atlantic bluefin tuna, setting total allowable catch ("TAC") quotas at levels that even its own scientists deemed unsustainable.[53] Moreover, the problem of illegal, unregulated, and underreported ("IUU") fishing and lack of enforcement by ICCAT led to a total catch of nearly double the TAC in 2007.[54]

The rapid decline in the Atlantic bluefin tuna population has been obvious for decades; Sweden initially proposed CITES listing in 1992.[55] The defeat of that proposal was accompanied by claims that ICCAT management of the bluefin tuna stock would improve, a promise echoed by those countries who worked to defeat this year's CITES Appendix I listing proposal.[56] Although ICCAT did reduce the TAC limits in 2009,[57] even with a near total ban population levels would still reach record lows in the next few years.[58]

The proposal and amended proposal to add the Atlantic bluefin tuna to Appendix I were both rejected despite recommendations by FAO's expert panel for approval.[59] Even the European Union, whose fishing fleets would be among those most effected, supported a modified version of the listing, which would have delayed inclusion of the species until May 2011.[60] Japan claimed to not oppose the listing on the grounds that it would reduce sushi and sashimi consumption, but rather because it would place a burden on coastal states and impair their sustainable use of the species.[61] Japan made this claim despite having previously indicated that it would take a reservation if the Atlantic bluefin tuna were added to Appendix I and serving bluefin tuna sushi at the Japanese embassy mere hours before the vote.[62] During the middle of the debate on the listing proposal, the delegate from Libya screamed at other parties, called everyone liars, and suggested that politics had trumped science in FAO's recommendation for listing, and called for an immediate vote on the proposal.[63] The move was not surprising considering Libya's fishing fleets are primary harvesters of the Atlantic bluefin tuna and are suspected of harvesting more than their legal quota.[64] Libya also established "fishing conservation zone" in the Mediterranean for exclusive use of one tuna ranching enterprise, which many consider to be a violation of international law.[65]

After Libya requested a vote, the Chair directed parties to first vote on whether to close the discussion.[66] Although Libya "called on the Chair to respect the Rules of Procedure and go straight to a vote on the proposal" the Chair reiterated the need to first address the issue of closing the discussion.[67] Monaco then requested a vote on adjournment of the session in an effort to allow for further debate on the proposal and postpone the vote until the plenary.[68] Although CITES COP Rule of Procedure 18 states that motions to adjourn should be considered before motions on closure of debate,[69] the Chair determined that as Libya's motion had already begun that "he had no option but to proceed."[70] The parties then voted to close the debate and rejected both the amended and original proposals through votes by a secret ballot.[71] Even if Monaco had succeeded in adjourning discussion to allow for additional consideration over a weekend,[72] it is likely that the "coalition" put together by Japan still would have defeated the proposal;[73] however, Libya's procedural maneuvering stopped debate in the only international forum dedicated to consideration of trade in wild species.

Sharks

Sharks are caught and traded for a number of reasons, with sharkfin soup most notable among them. They are also often captured as accidental bycatch in fishing operations targeting other species, which can complicate listing efforts, as the killings are not a direct result of trade in the species.

All four proposals to add shark species of "great commercial value" to Appendix II were rejected,[74] although they received varying levels of support for listing during discussions, with one listing initially accepted only to be overturned in the plenary session two days later.[75] China led the rejection of listing proposals for sharks, as the world's foremost consumer of sharks, along with Japan, which opposes CITES listing for any marine species.[76]

The proposal to list the scalloped hammerhead shark in Appendix II was considered first. The United States had initially included four look-alike shark species, but withdrew two species based on the assessment by the FAO expert panel and the CITES Secretariat.[77] Many countries spoke out in support of the proposal citing, inter alia, a decline to between fifteen and twenty percent of the baseline population, FAO support for the proposal, lack of species-specific management plans under RFMOs, and absence of any enforcement by ICCAT of their 2004 prohibition on finning.[78]

Arguments against listing included the familiar "RFMOs [a]re the appropriate management body" for the proposed species, as well as claims that technical and identification issues were insurmountable, even with an amended twenty-four month implementation delay.[79] Moreover, Singapore noted that they did not believe that CITES was intended to deal with marine species—despite specific provisions related to marine species in both the Convention and the listing criteria[80]—noting issues with preparation and documentation for non-detriment findings and introduction from the sea.[81] Although the proposal did receive a simple majority of the affirmative votes, it did not meet the two-thirds majority required for approval.[82]

The oceanic whitetip shark, a species prized for its fins, was considered for listing during the same session and is also estimated to have declined to between fifteen and twenty percent of its baseline population.[83] Although the EU and twenty-one other countries have instituted shark-finning bans, no international management plans exist for the species.[84] FAO also recommended approval of the proposal.[85] Supporters noted that, due to its distinctive fin, identification should not present a problem and the United States offered capacity building assistance.[86] In addition to arguments noted above in opposition to the proposal to list the scalloped hammerhead shark, Japan supported Venezuela's position that inclusion of the oceanic whitetip shark would infringe upon their sovereign fishing rights.[87] The proposal was rejected by a similar margin as the proposal for the hammerhead shark.[88]

Although the porbeagle shark is one of the most widespread shark species, its population has declined to around twenty percent of its baseline population, with declines to less than ten percent in the most affected populations.[89] The porbeagle is caught primarily for its meat, although fins and oil are also traded.[90] An updated stock assessment led FAO reevaluate the species and to support listing in COP-15, although it had opposed the proposed listing at COP-14.[91] The EU clarified that, contrary to comments made by China and others, they had closed their internal porbeagle fisheries, so that any porbeagle consumed within the EU would be imported.[92] The EU expressed a desire to ensure that all future imports of porbeagle are sustainably harvested.[93]

Despite similar opposition to the listing of the porbeagle as to the listing of the other shark species, the proposal passed in secret ballot voting with eighty-six in favor, forty-two against, and eight abstentions.[94] In the plenary session, however, Singapore made a motion under Rule 19 to reopen debate on the proposal stating they believed that there was a "technical problem" with the vote in Committee I.[95] Although the United States and Croatia were opposed to reopening debate, the requirement for one-third of parties present and voting in favor of the motion was met.[96] Interestingly, in the two days between the approval in Committee I and the vote in the plenary, four votes against the proposal were added, two of the votes in favor were lost, and two abstentions were added, ultimately defeating the listing proposal for the porbeagle.[97]

The final shark listing proposal was for the spiny dogfish, which is threatened by trade in its high-value meat primarily destined for the EU.[98] FAO concluded that the spiny dogfish species as a whole did not meet the listing criteria for addition to Appendix II.[99] Due to the reduction in the total catch in the EU to zero because of significant declines in the population, the non-threatened southern populations would have had to be listed based on the look-alike criteria.[100] Several range countries noted that their internal management measures were sufficient and that populations remained stable.[101] A lack of concrete data on population decline due in part to "incomplete species-specific records" may have also hampered support for listing.[102] The proposal was easily defeated, with a majority voting against approval.[103]

Coral

International demand in trade of coral is for jewelry, use in aquariums, and its limestone content for making cement, calcium supplements, and other products.[104] The genus of red and pink corals proposed for listing are the most commercially exploited group of precious corals,[105] and populations have declined significantly recently, with the reproductive modules at ten to twenty percent of the baseline.[106] Although the United States has banned collection of coral from its own reefs, it is still the world's largest importer and introduced the listing proposal to ensure the sustainable management of coral in trade.[107]

This was the second time that the proposal to list the red and pink coral was rejected at a CITES COP. Listing of the species was initially approved in Committee I at COP-14 in 2007, but debate was reopened and the proposal was subsequently rejected.[108] There was vocal opposition to the listing proposal by Italian artisans who use the Mediterranean coral to make valuable jewelry, including necklaces that can cost as much as $25,000.[109]

In debate it was noted that collection methods for coral should be considered "mining" rather than fishing, due to the fact that the harvested resource was non-renewable.[110] Iran stated that if trade was not regulated "both the continued trade in precious corals and the livelihood of the people involved would be in doubt."[111]

Opposition to the proposal included the belief that the General Fisheries Commission for the Mediterranean was the appropriate management body for the coral species, that, if listed, "consumers would think that buying [the coral] would be environmentally unfriendly," and FAO's assessment that the species did not meet the listing requirements for Appendix II.[112] Not surprisingly, the proposal barely received a majority and was thus rejected.[113]

Timber Species

In contrast to the proposals on commercially exploited marine species, two proposals on economically important timber species were accepted without much debate. Although efforts to list some timber species have met with resistance at past COPs, rosewood and holy wood proposals were offered by Brazil and Argentina respectively—countries that are principal sources of the species in international trade.[114] Marine and timber species have a range of different issues related to listing in CITES, however, if countries proposing the listings are involved in international trade of a species as exporters and meet with little opposition from importers, listing proposals may more easily be approved.

If CITES is to be more than "an ambulance at the bottom of the cliff," waiting to rescue a species that it may not be able to save, then countries must make decisions to list species before their extinction is virtually guaranteed.

In contrast to the opposition that the rosewood listing proposal met with at COP-14, the proposal for inclusion in Appendix II was approved by consensus at COP-15.[115] In 2007 Latin American range states opposed the proposal, citing livelihood concerns and implementation issues with CITES obligations for timber species. As much of the international trade is from wood harvested in Brazil that is being cut—both legally and illegally—at a greater rate than it regenerates, Brazil presented the COP-15 listing proposal for rosewood, which is used as an ingredient in perfume.[116] Although concerns with identification in finished products were expressed, an amendment excluding those products was accepted, as was a proposal to create a task force to work on identification issues.[117]

Argentina, which with Paraguay has the majority of holy wood stands, recommended the addition of the species to Appendix II because of pressures from habitat loss and trade.[118] Holy wood is used for its essential oil and timber, in medicines, and for a number of traditional uses.[119] The proposal was passed by consensus after a draft decision by Spain for creating a task force to address technical issues was considered, and subsequently also approved.[120]

Recommendations

Adding Commercially Exploited Species to CITES Appendices at Future COPs

It is obvious that the conflict over addition of commercially exploited marine and timber species to CITES Appendices is not going away. The CITES Secretariat must be clear that *all* species threatened by international trade should be included in the appropriate Appendix once it has been determined by the CITES Secretariat that they meet the listing criteria. Although the listing criteria already include specific guidelines for determining whether a marine species is in decline, the CITES Secretariat must be given the support and funding to demonstrate that CITES does and should have jurisdiction over international trade in additional aquatic species, despite some parties' opinions.

Countries must build coalitions and mobilize support for listing proposals months in advance of voting at COPs. If possible, countries substantially involved in the trade of a species should recommend the listing, as in the case of Brazil with the rosewood proposal and Argentina with holy wood. Although approving a listing proposal is much more difficult than defeating it because of the requirement of approval by two-thirds of the votes,[121] Japan's "diplomatic" approach leading up to COP-15 shows the importance of lining up support prior to the vote. In contrast, the EU announced their support for a trade ban for the bluefin tuna just days before the start of COP-15 and was divided on the original proposal, after their amended proposal delaying inclusion of the species failed to garner enough votes for passage.[122] There will of course always be last minute negotiations in the halls of COPs, but it is unlikely that a coalition to approve a proposal can be created at the meeting.

Economic and livelihood concerns now play an important role, either overtly or covertly, in the decision of whether to include a species in a CITES Appendix. Leading up to a COP, the recommending country and proponents of listing must identify potential livelihood concerns and use national trade, environment, and development agencies to work with potentially effected sectors in developing countries to find viable alternatives. If countries

in favor of listing try to address economic concerns of a proposal prior to a vote, then it will be more apparent that opponents are citing livelihoods as an excuse to continue the status quo because of a culinary preference for certain marine species. CITES listing should not be a debate between jobs and species; if unsustainable harvesting continues we should not be surprised to discover that both have disappeared.

It has been suggested that the burden placed upon exporting countries to certify "non-detriment" to an Appendix II species prior to exportation creates resistance to list on the part of some countries.[123] Although offers of capacity building support have increased, additional responsibility on the part of importing countries in the form of bilateral cooperation or regulatory measures could help build support for listing approval.[124]

FAO listing recommendations for marine species at COP-15 were only followed when they stated that the species did not meet listing criteria. The inconsistent application of FAO's recommendations and the fact that they often conflict with the CITES Secretariat is not leading to listing decisions firmly based on science. The relatively new practice of presenting FAO recommendations at COPs should be adjusted so that FAO can provide expertise and support directly to the CITES Secretariat. FAO and CITES should coordinate to provide one recommendation on each proposal, using FAO's technical and scientific expertise within the CITES framework of regulation of international trade in wild species.

Alternate Approaches to Protecting Wild Species

Parties should capitalize on the growing international and public pressure for better management of bluefin tuna. It appears that the threat of listing may have led ICCAT to reduce the TAC at its November 2009 meeting; this reduction must be enforced and lowered to zero at the 2010 meeting to prevent the imminent collapse of the stock. ICCAT also has provisions for prohibiting imports from countries that have caught more than their allocated quotas for two consecutive years.[125] Despite attempts by the United States to enforce the provisions against Europe and Libya, the measure has only been used once—and against Equatorial Guinea.[126] ICCAT must be made to enforce its internal trade measures and prohibit imports from countries that regularly violate their quotas.

A near universal argument of opponents to listing aquatic species was that RFMOs were the appropriate forum for management. Although membership in RFMOs is much more limited than that of CITES, countries wishing to protect threatened species should also pursue species specific regulation and catch limits for sharks through the relevant RFMOs. Cooperation between RFMOs with distinct populations of the same species should also be encouraged.

As a last resort countries could enact unilateral import and export bans for severely threatened species. If the United States is serious about protecting red and pink coral then it should enact a ban on imports of the species, to complement its existing ban on coral harvesting.[127] Countries would likely be more willing to consider listing coral in Appendix II if the alternative was a ban on coral exports to the United States. The EU could also attempt to do the same for the shark species it currently has fishing bans for in its waters.

Conclusion

It is increasingly difficult to get species listed in Appendix I or II of CITES: those species that are threatened with extinction that countries can agree to stop trade in have already been added. For commercially exploited species endangered by trade there is likely to be resistance to limiting that trade, at the very least from those who are engaged in trading the species. Even when, as in the case of the bluefin tuna, the evidence that listing criteria are met is clear, countries are increasingly willing to ensure that a threatened species is not protected because they want to keep selling and buying it.

Awareness of the plight of species has been increased as a result of the debates at COP-15, but ICCAT quotas are still too high to allow for recovery of the bluefin tuna stock, RFMOs have no management authority to prevent increased shark harvesting for sharkfin soup, and coral is threatened not only by rising sea level temperatures caused by global warming, but for use in jewelry.

If CITES is to be more than "an ambulance at the bottom of the cliff,"[128] waiting to rescue a species that it may not be able to save, then countries must make decisions to list species before their extinction is virtually guaranteed. Through creation of new coalitions and addressing livelihood concerns of developing countries, countries can ensure CITES continues to be a force for international biodiversity protection.

Endnotes: Getting on the List: Politics and Procedural Maneuvering in Cites Appendix I and II Decisions for Commercially Exploited Marine and Timber Species

[1] *See, e.g.*, Justin McCurry, *How Japanese sushi offensive sank move to protect sharks and bluefin tuna*, The Guardian (London), Mar. 26, 2010, *available at* http://www.guardian.co.uk/environment/2010/mar/26/endangered-bluefin-tuna-sharks-oceans; David Jolly & John M. Broder, *U.N. Reject Export Ban on Atlantic Bluefin Tuna*, N.Y. Times, Mar. 18, 2010, *available at* http://www.nytimes.com/2010/03/19/science/earth/19species.html?ref=global-home; *Bluefin tuna: Eaten away*, The Economist Online, Mar. 18, 2010, http://www.economist.com/science-technology/displaystory.cfm?story_id=15745509&source=features_box_main (last visited Apr. 18, 2010); Summary of the Fifteenth Conference of the Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora, Earth Negotiations Bulletin (Int'l Inst. for Sustainable Dev., New York, N.Y.), Mar. 29, 2010, *available at* http:// www.iisd.ca/download/pdf/enb2167e.pdf [hereinafter ENB CITES COP-15].

Endnotes: Getting on the List *continued on page 54*

The Role of the Public in the American Pika's Future

*by Yoona Cho**

The U.S. Fish and Wildlife Service ("the Service") recently announced its decision not to list the American pika under the Endangered Species Act ("ESA").[1] While many view this as a defeat, the story of the American pika is instructive in that it demonstrates that science alone cannot drive change and ensure protection for vulnerable species. Rather, it has historically been, and will continue to be public participation and pressure that will bring about the necessary change.

The American pika is a small mammal that lives on the fields of alpine and subalpine mountain areas. These small mammals are extremely sensitive to hot temperatures, and certain to be impacted by climate change.[2] In 2007, the Center for Biological Diversity ("CBD") filed a petition with the Service to list the pika under the ESA.[3] Then in 2008, the CBD filed lawsuits against both the California Fish and Game Commission and the Service for failing to list the pika.[4] As a result of these actions, the Service decided to launch a full review to determine if pikas warrant protection under the ESA.[5]

The ESA directs the Secretary to make a determination solely on the basis of the best scientific and commercial data available.[6] This language, however, fails to provide a clear standard. After completing what it called an "exhaustive review of the scientific information currently available," the Service determined that the pika's survival is not at risk for the foreseeable future.[7] The Service's finding, however, contradicts certain scientific studies which show that the pika is rapidly disappearing from the United States.[8] Given the frequent variance of scientific data, the pika's story serves as a warning to environmental advocates: public participation and pressure, not science, are the most important tools for saving the pika and other endangered species.

Principle 10 of the Rio Declaration declares that environmental issues are best handled with active participation from concerned citizens.[9] Wide acceptance of principle 10 led to the adoption of the Aarhus Convention,[10] which calls for three standards to be met in decision-making: public participation, access to information, and access to justice.[11] More than empty rhetoric, these provisions have since been used to protect vulnerable species in a number of cases.

The road to protection has been long and complicated for the polar bear. Science certainly provided the rationale for their protection, but it was the efforts of a group of interested citizens that led to the long-awaited listing of the bears. The journey began with a petition filed in 2005 by the CBD, which was promptly joined by the Natural Resources Defense Council and Greenpeace.[12] These organizations filed a lawsuit against the Bush administration for ignoring the petition.[13] After three years and much struggle, the Service published a final rule announcing its intent to list the polar bear as a threatened species under the ESA.[14] The deciding factor was continuous pressure from the public, not scientific proof.

Concerned citizens have also prevailed in the courtroom. When the Secretary of the Interior failed to include mute swans on the list of birds protected by the Migratory Bird Treaty Act, a citizen filed a complaint in District Court.[15] She claimed that this failure was arbitrary and capricious under the Administrative Procedure Act.[16] Ultimately, the Court of Appeals found for the complainant, ruling that the reference to "swans" found in the treaty indisputably included mute swans.[17] Similar efforts saved a little-known species that lives in the Little Tennessee River. Environmental groups filed a suit against a construction company seeking to enjoin the completion of the Tellico dam, which would have caused the extinction of the snail darter.[18] Despite recognizing that this injunction would cause considerable economic loss, the Supreme Court ruled to protect the snail darter's habitat.[19]

In addition to these examples of proactive citizen advocates, provisions in relevant legislation also demonstrate the increasing recognition of the public's role in protecting the environment. The National Environmental Policy Act has a provision that requires the government to provide for public involvement in completing its environmental impact assessments ("EIA").[20] Provisions requiring public input during the EIA process are not unique to the United States. The European Union compels similar action through its directive.[21]

The story for the American pika continues, and the recent announcement is only a hurdle. Rarely has society gained meaningful change through governmental action alone. Continuous efforts by the concerned public armed with the necessary scientific data will effectuate policy change. Public participation has proven effective for the polar bear, and hopefully it will do the same for these small mammals in the mountains.

Endnotes: The Role of the Public in the American Pika's Future *continued on page 56*

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Finding the Balance:

Harmonizing Renewable Energy with Wildlife Conservation

*by Tina R. Goel**

In 2009, Secretary Salazar announced that the development of renewable energy is a "top priority" for the Department of the Interior ("DOI"),[1] and approximately one year later he approved the first offshore wind energy project.[2] Although prioritizing renewable energy development is an important step towards using fewer finite resources, renewable energy production must not be permitted to sidestep compliance with federal environmental laws.[3] Developers, regulators, and wildlife advocates must not be permitted to ignore threats to biodiversity and other aspects of natural ecology caused by renewable energy projects.

While energy consumption in the United States has been on the rise for sixty years, domestic production has been unable to keep up with the increase since 1970, resulting in substantial energy imports.[4] During the same period, domestic renewable energy consumption also increased and in 2008, it accounted for seven percent of total energy consumed.[5] To reduce dependence on foreign energy sources and slow the pace of climate change, stakeholders must seriously consider increasing domestic wind and solar energy production.[6]

The environmental effects of fossil fuels, such as coal and oil, are well established and often cited as reasons for diversifying energy production and consumption.[7] Coal's unique environmental concerns begin with adverse effects on water and land during mining and persist well after we use coal-generated electricity, emitting greenhouse gases that exacerbate climate change.[8] Similar to coal, oil's environmental effects begin as early as exploration with the use of seismic testing to identify oil reserves and continue through extraction, refining, transportation, and consumption.[9] In addition, whether for a coal mining operation or an oil-drilling project, a related concern is biodiversity conservation and compliance with the Endangered Species Act.[10]

Although the use of renewable energy has fewer adverse environmental effects than the use of fossil fuels, there are still numerous concerns arising from the development of wind and solar energy.[11] Before any "green" energy is generated, equipment for wind and solar projects must be produced, transported, and installed—all through a carbon-intensive process.[12] In addition, site selection for wind and solar energy projects must take into account possible conflicts with much needed habitat for endangered species.[13] To assist in site selection, the Natural Resources Defense Council ("NRDC") developed and released an interactive map highlighting areas of the western United States that are inappropriate for development.[14] This however, should not discourage renewable energy advocates and industry; early collaborative planning can ensure the success of renewable energy projects.

Wind projects are often criticized for their potential to negatively affect avian and bat populations.[15] Proposed approximately a decade ago, the Cape Wind project has been a source of great conflict between those seeking to protect an important migratory bird route and those seeking to develop offshore wind power; it recently received federal approval.[16] This approval bodes well for renewable energy advocates and developers, but the cost of progress is too high if a thorough review of impacts upon endangered species has not been conducted.[17] Nonetheless, a balance between renewable energy and biodiversity is possible.[18]

In December 2009, in a West Virginia wind project litigation, the court held that although "there is a virtual certainty that Indiana bats will be harmed [during much of the year] . . . in violation of § 9 of the [Endangered Species Act]" the turbines already under construction may operate while the bats are hibernating in the winter.[19] To gain permission to operate the turbines year-round, the court invited the developer to apply for an incidental take permit,[20] which is designed to authorize takings of endangered species, such as the Indiana bat.[21] Such permits often contain mitigation measures designed to limit harm to wildlife.[22] As the court noted, "[t]he two vital federal policies . . . one favoring the protection of endangered species, and the other encouraging development of renewable energy resources . . . are not necessarily in conflict."[23]

Solar energy projects are also anticipated to threaten endangered species[24] and projects near desert tortoise and pupfish habitats can learn from the Indiana bat wind project. In addition to disturbing important habitat, solar projects can cause avian mortality and consume scarce water supplies.[25] Nonetheless, by consulting the NRDC renewable energy map prior to siting a project,[26] applying for an incidental take permit,[27] and consulting with affected state governments, such as Arizona and California,[28] developers can gain access to much needed sites for energy generation.

We must not presume that a wind or a solar project is environmentally sound merely because it emits less carbon dioxide than fossil fuels.[29] All stakeholders—environmentalists, industry, and the government—must remember that no source of energy is truly green[30] and that a legal framework exists to help determine that a hydroelectric project in the middle of the desert is probably not environmentally sound.

Endnotes: Finding the Balance: Harmonizing Renewable Energy with Wildlife Conservation *continued on page 56*

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Will Climate Change Help or Harm Species Listing?

*by Jessica B. Goldstein**

While many know the effects climate change has on the polar bear, few know that climate change also affects the grizzly bear. On March 26, 2010, environmental groups were victorious when the United States Fish and Wildlife Service ("FWS") reinstated the Endangered Species Act ("ESA") regulatory protections[1] for the grizzly bear (*Ursus arcots horribilis*) to comply with the decision in *Greater Yellowstone Coalition, Inc. v. Servheen*.[2] However, now that the ESA can potentially be used to keep species listed due to ensuing climate change threats, will FWS be more wary when initially listing species?

The 1973 Congress enacted the ESA with the view that an endangered species' value is immeasurable.[3] Therefore, supposedly a species with high costs of recovery and low economic benefits receives the same treatment as a species with possibly large benefits and low costs.[4] However, budget constraints allow only about 100 species to be listed each year and official preferences get top priority.[5] An ESA official may hesitate to list a species that, due to the threat of climate change, may never be removed in light of the impact that species might have on the budget.[6]

In the ESA and later amendments, Congress stressed the importance of preserving the ecosystem.[7] Scientists identified that saving the habitat of a species increases the chances of species survival.[8] While a recent lawsuit mandated the continued listing of the grizzly bear due to climate change threats on an important food source, it is unclear if FWS will modify initial species listings in the future.

In 1975, the grizzly bear was listed as a threatened species under the ESA.[9] On March 29, 2007, FWS promulgated its rule, declaring the Greater Yellowstone Area ("GYA") grizzly bear population a distinct population segment ("DPS"), thereby removing it from protection under the ESA.[10] The resulting lawsuit was led by numerous environmental groups, jointly known as the Greater Yellowstone Coalition ("GYC").[11] The GYC sued members of the FWS along with the Secretary of the Interior, Dirk Kempthorne,[12] alleging four claims, two of which succeeded.[13]

First, the GYC argued that the Service did not provide adequate regulatory mechanisms to maintain the recovering grizzly bear population.[14] The regulatory mechanisms in the 2007 Rule lacked teeth, depending only on guidelines, monitoring, and good intentions for future action.[15] This is problematic, as a species removed from ESA protection needs an immediately enforceable plan to keep the population stable, as it will be susceptible to new dangers.[16]

The GYC also argued that the FWS did not adequately consider climate change's impact on the whitebark pine, an important food source for grizzly bears.[17] The whitebark pine is threatened by climate change which has increased the population of its predators, the pine nut beetle and the white pine blister rust.[18] However, the FWS concluded that the grizzly bears should be able to adapt to the loss of the whitebark pine.[19]

U.S. District Judge Donald W. Molloy held that the FWS failed to consider the potential impacts of global warming and whether adequate regulatory mechanisms existed.[20] While the FWS is considering an appeal, in the meantime, the case has forced the FWS to keep the Greater Yellowstone Area grizzly bear listed as a threatened species under the ESA.[21]

If the FWS has to consider the impacts of climate change in its determinations under the ESA, this potentially opens the door for the listing of a multitude of species. This case could be the beginning of litigation by environmental groups to keep species protected under the ESA due to the impacts of climate change on a species' habitat and food sources.[22] While it might appear that a population has recovered, a change in that species' environment or food source will leave it vulnerable.[23] One concern is that after *GYC v. Servheen*, the FWS may be more cautious in its initial decision to list a particular species out of fear that it will never be removed due to climate change arguments.[24]

While this may become an issue in the future as climate change impacts increase, at least for now, the National Oceanic and Atmospheric Administration ("NOAA")[25] does not seem deterred by the ruling in *GYC v. Servheen*. On March 16th, 2010, NOAA announced it is listing the eulachon (also known as the Columbia River smelt) DPS as threatened due to global warming and other factors pushing it towards extinction.[26] It is important to note, however, that Native American tribes asked to have this fish listed in 2007 and it took two years before NOAA proposed a rule.[27] If climate change speeds up, other species might be left behind.

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[13] *Id. See Fish Facts,* The End of the Line, *available at* http://endoftheline.com/campaign/fish_facts/ (asserting that more recent studies from the FAO and World Wildlife Fund indicate the state of world fisheries is even worse than originally thought).

[14] Findings, *supra* note 12.

[15] *Id. See also* Hansen, *supra*, note 8, at 225 (highlighting the Millennium Assessment warnings of "non-linear" ecological changes, i.e., changes in air, water, species, weather or land patterns that are abrupt and sudden due to "tipping points" in the ecological equilibrium of several millennia).

[16] *See, e.g.*, Carl Bruch & Elizabeth Maruma Mrema, *More Than the Sum of Their Parts: Improving compliance with and enforcement of international environmental agreements through synergistic implementation*, The Environmental Forum, 2009 (discussing the synergistic implementation of Biodiversity-Related MEAs at 27-29).

[17] *See, e.g.,* U.S. Environmental Protection Agency, Reducing Risk: Setting Priorities and Strategies for Environmental Protection 1 (1990).

[18] *See, e.g.*, CBD Secretariat, Gincana 3: Biological Diversity and Climate Change 1 (2007).

[19] John Ackerman, *Climate Change, National Security, and the Quadrennial Defense Review: Avoiding the Perfect Storm*, Strategic Studies Q., Spring 2008, at 56 (quoting Center for Naval Analysis (CNA) Corporation, National Security and the Threat of Climate Change 6 (2007)).

[20] *See, e.g.*, Press Release, U.S. National Science Foundation, Future Risk of Hurricanes: The Role of Climate Change (Oct. 8, 2008) (asserting that increased violent weather will contribute to these problems), http://www.nsf.gov/news/news_summ.jsp?cntn_id=112394&org=AGS (last visited Apr. 18, 2010); News Release, National Center for Atmospheric Research, Global Warming Surpassed Natural Cycles in Fueling 2005 Hurricane Season, June 22, 2006, http://www.ucar.edu/news/releases/2006/hurricanes.shtml (last visited Apr. 18, 2010).

[21] *See, e.g.*, Rajesh Chhabara, *Climate change refugees seek new international deal*, Climate Change Corp., Dec. 27, 2008, http://www.climatechangecorp.com/content.asp?contentid=5871 (last visited Apr. 18, 2010).

[22] *See, e.g.*, Lester Brown, *Melting Mountain Glaciers Will Shrink Grain Harvests in China and India*, Earth Policy Institute, Mar. 20, 2008, http://www.earthpolicy.org/index.php?/plan_b_updates/2008/update71 (last visited Apr. 18, 2010).

[23] *See, e.g.*, Damian Carrington, *IPCC officials admit mistake over melting Himalayan glaciers*, UK Guardian, Jan. 20, 2010, http://www.guardian.co.uk/environment/2010/jan/20/ipcc-himalayan-glaciers-mistake (last visited Apr. 18, 2010).

[24] *See, e.g.*, Thomas Friedman, Hot, Flat and Crowded (2008); Lauren Morello, *New Study Predicts Massive Food Shortages by Century's End*, ClimateWire, Jan. 09, 2009.

[25] *See* Susan Fletcher, Congressional Research Service, Biological Diversity: Issues Related to the Convention on Biodiversity (1995) (concluding that biodiversity loss was real and a threat to U.S. interests and that broad consensus existed with the President and Senate "after working with industry and environmental groups to resolve problems with some treaty language", and affirming that "no new legislation would be needed to implement the treaty, as current law is regarded as sufficient to carry out the treaty terms").

[26] CBD, *supra* note 1, pmbl.

[27] *See id.* art. 1. *See generally* Lyle Glowka et al., A Guide to the Convention on Biological Diversity (1994) (Annotating the Convention).

[28] CBD, *supra* note 1, art. 2.

[29] *See id*. art. 10.

[30] *Id.* art. 3. *See also id*. art. 15.1 ("Recognizing the sovereign rights of States over their natural resources, the authority to determine access to genetic resources rests with the national governments.").

[31] *See, e.g.*, S. Rep. No. 103-30, at 5; IUCN, *supra* note 5, at 2; *see also*, Desiree McGraw, *The CBD – Key Characteristics and Implications for Implementation*, RECIEL, Vol. 11(1), at 18-19 (2002).

[32] *Id.* (quoting W. Lang, *International Environmental Cooperation*, in G. Sjostedt & S. Uno, The Swedish Institute of International Affairs, International Environmental Negotiations: Process, Issues and Contexts 19 (1993)).

[33] *See generally* Memorandum of Record by Secretaries Christopher, Babbitt and Espy to Senate Majority Leader George Mitchell (Aug. 16, 1994) (indicating that the U.S. retains full sovereignty under the "framework" conception of the CBD); President's Message to the U.S. Senate transmitting the CBD, Weekly Comp. Pres. Doc. (Nov. 19, 1993) ("There are hundreds of State and Federal Laws and programs and an extensive system of [lands and waters] . . . considered sufficient to effectively implement our responsibilities under the Convention.").

[34] S*ee* S. Rep. No. 103-30, at 6-16 (describing each article of the CBD). Other important CBD articles deserve attention for their impacts upon the conservation (and sustainable use) of biological diversity, including Article 5 (Cooperation); Article 7 (Identification and Monitoring); Article 9 (Ex-situ Conservation); Article 11 (Incentive Measures); Article 12 (Research and Training); Article 13 (Public Education and Awareness); and Article 25 (Subsidiary Body on Scientific, Technical and Technological Advice).

[35] For the current work program of the CBD, *see* Programmes, Convention on Biological Diversity, http://www.cbd.int/programmes (last visited Apr. 18, 2010).

[36] Over 160 of the 191 Parties to the Convention have completed their Biodiversity Action Plans under Article 6 and twenty-five parties have completed at least one revision: Angola, Austria, Belize, Bhutan, Botswana, Brazil, Cuba, Republic of Congo, Estonia, European Community, Finland, Indonesia, Japan, India, Latvia, Madagascar, Morocco, Netherlands, Philippines, Singapore, St. Vincent, Sweden, Thailand, United Kingdom and Vietnam.

[37] The beauty of the U.S. federal system is not only its breadth and depth, but also its advancement of U.S. biodiversity interests with multiple legal tools, many of which have been borrowed by other countries and, in reality, by the CBD. It is a long list, constantly evolving and most certainly not exclusive: National Forest Management Act, 16 U.S.C. §§ 1600-1616 (1976) (explicit "diversity" standard statute); National Park Service Organic Act, 16 U.S.C. §§ 1 (1916) (protection of natural resources for future generations); National Wildlife Refuge Administration Act, 16 U.S. §§ 668dd-668ee (1998); Marine Sanctuaries Act, 16 U.S.C. §§ 1431-1445 (2000); Federal Land Management and Policy Act, 43 U.S.C. §§ 1701-1784 (1976); Sikes Act (Department of Defense lands and waters), 16 U.S.C. §§ 670g-670o (1974); Farm Bill provisions (e.g., "Swampbuster" and Conservation Reserve Programs), 16 U.S.C. §§ 3801, 3821-23, 3831-3836 (1985); Antarctic Conservation Act, 16 U.S.C. §§ 2461-2466 (1979); Alaska National Interest Lands Conservation Act, 16 U.S.C. §§ 410, 460, 539, 3101-3233, 1631-42 (1934); Coastal Zone Management Act, 16 U.S.C. §§ 1451-1465 (1972); Outer-continental Shelf Lands Act, 43 U.S.C. §§ 1331-1376 (1953); Wilderness Act, 16 U.S.C. §§ 1131-1136 (1964); Endangered Species Act, 16 U.S.C. §§ 1531-1544 (1973); Lacey Act 16 U.S.C. §§ 701, 3371-78 (1900); Fish and Wildlife Coordination Acts, 16 U.S.C. §§ 661-666c, 670 (1934); Federal Aid in Wildlife Restoration Act, 16 U.S.C. §§ 669-669i (1937); Federal Aid in Fish Restoration Act, 16 U.S.C. §§ 777-777l (1950); Land and Water Conservation Fund Act, 16 U.S.C. §§ 4601-4611 (1990); National Environmental Education Act, 20 U.S.C. §§ 5501-10 (1995); Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. §§ 1801-1882 (1976); Federal Noxious Weeds Act, 7 U.S.C. §§ 2801-14 (2000); Federal Insecticide Fungicide Rodenticide Act, 7 U.S.C. §§ 136 (1947); Clean Water Act, 33 U.S.C. §§ 1251-1387 (1972); Clean Air Act, 42 U.S.C. §§ 7401(1970); Global Climate Change Prevention Act of 1990, 7 U.S.C. §§ 6701-10 (2004); Marine Mammal Protection Act, 16 U.S.C. §§ 1361-1407 (1972); Migratory Bird Treaty Act, 16 U.S.C. §§ 703-712 (1918); Scenic and Wild Rivers Act, 16 U.S.C. §§ 1271-1287 (1968); Wild Bird Conservation Act, 16 U.S.C. §§ 4901-4916 (1992); Tuna Conventions Act, 16 U.S.C. §§ 951-961 (1950); Great Lakes Fish and Wildlife Restoration Act, 16 U.S.C. § 941(1990); Colorado River Basin Salinity 43 U.S.C. §§ 1571-1599 (1974); African Elephant Conservation Act, 16 U.S.C. §§ 4201-4245 (2002); Rhinoceros and Tiger Conservation Act, 16 U.S.C. §§ 5301(1994); National Trail System Act, 16 U.S.C. §§ 1241-51(2009); and others.

[38] U.S. Const. art. I., § 8; amend. X, XI; *See also* Susan George & William Snape, *State Endangered Species Acts*, *in* Endangered Species Act: Law, Policy and Perspectives 345-59 (Donald C. Baur & Wm. Robert Irvin, eds., 2d ed. 2010).

[39] *See generally* 42 U.S.C. § 7401(1970); 33 U.S.C. § 1251 (1972).

[40] *See* Association of Fish and Wildlife Agencies, http://www.fishwildlife.org/ (last visited Apr. 18, 2010) (describing the different biodiversity-related activities done by the 50 + state fish and wildlife agencies).

[41] *See* S. Rep. No. 103-30, at 6-7.

[42] *See generally cases sited supra*, note 37, and particularly the Endangered Species Act, National Forest Management Act, Wildlife Refuge Act, and the National Environmental Policy Act.

[43] *See* Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§ 9601-9675 (1980); Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901-6992k (1976).

[44] *See, e.g.*, The Toxic Substances Control Act, 15 U.S.C. §§ 2601-2692 (1976); *see generally* Animal and Plant Health Inspection Service programs; Food and Drug Administration nanotechnology policies; and the National Genetic Resources Program.

[45] 16 U.S.C. §§ 4701-4751 (1996).

[46] 16 U.S.C. §§ 528-531 (1960) (providing that some public lands in the United States are managed under the "multiple use/sustained yield" concept).

[47] *See* National Environmental Policy Act, 42 U.S.C. §§ 4321; 40 C.F.R. § 1500. *See, e.g.*, U.S. Council on Environmental Quality, Incorporating Biodiversity Considerations Into Environmental Impact Analysis Under the National Environmental Policy Act (1993) [hereinafter CEQ]. *See also* CBD, *supra* note 1, art. 7 (Identification and Monitoring); U.S. National Research Council, A Biological Survey for the Nation (1993).

[48] *See* American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act, Endangered Species Program, U.S. Fish and Wildlife Service, http://www.fws.gov/endangered/tribal (last visited Apr. 18, 2010) (stating that "[m]any Indian lands have remained untouched by conventional land use practices and therefore are an island of high quality ecosystems, attracting many sensitive species."). *See also* Dean B. Suagee, *Cultural Rights, Biodiversity and the Indigenous Heritage of Indian tribes in the United States*, *in* Cultural Rights, Cultural Wrongs 81-102 (Halina Niec, *ed.*, 1998).

[49] These conventions, treaties, agreements and declarations include the North American Agreement on Environmental Cooperation, 32 I.L.M. 1480 (1993); the Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere, 161 U.N.T.S. 193 (1940); International Convention for the Conservation of Atlantic Tunas, 20 U.S.T. 2887 (1966); the U.N. Framework Convention on Climate Change, 31 I.L.M. 849 (1992); U.N. Convention to Combat Desertification, 33 I.L.M. 1328 (1994); Convention on International Trade in Endangered Species, 993 U.N.T.S. 243 (1975); Convention Concerning the Protection of World Cultural and Natural Heritage, 11 I.L.M. 1358 (1975); Inter-American Biodiversity Information Network, International Coral Reef Initiative, Convention on Wetlands of International Importance (Ramsar), 11 I.L.M. 963 (1975); Agreement Relating to Conservation and Management of Straddling Stocks and Highly Migratory Species, 34 I.L.M. 1542 (1995); Convention on Antarctic Marine Living Resources, 19 I.L.M. 841 (1982); Polar Bear Treaty, 13 I.L.M. 13 (1976); Rio Declaration on Environment and Development, 31 I.L.M. 874 (1992); Montreal Protocol on Substances that Deplete the Ozone Layer, 26 I.L.M. 1550 (1987); Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region, 22 I.L.M. (1983); International Convention for the Prevention of Pollution from Ships (MARPOL), 12 I.L.M. 1319 (1973); Convention for Regulation of Whaling, 161 U.N.T.S. 72 (1946); and others.

[50] While more work is needed, the United States Congress has been at the forefront of international efforts to reform biodiversity-related aid programs under both multilateral development banks such as the World Bank and U.S. federal agencies such as the Agency for International Development. So-called "debt for nature" swaps have also proven effective in advancing all three of the CBD's objectives.

[51] CBD, *supra*, note 1, art. 14.1-2 (Article 14.2 contains an unused provision that the U.S. would want to oversee pertaining to "studies" on "the issue of liability and redress, including restoration and compensation, for damage to biological diversity, except where such liability is a purely internal matter."); Anti-Deficiency Act, 31 U.S.C. § 1341 (1982). (prohibiting the making or authorizing of any expenditure or obligation of any appropriations or funds in excess of the amount available in the appropriation unless authorized by law).

[52] *See, e.g.*, William J. Snape, III, Biodiversity and the Law 178-201 (1996) (addressing how the National Environmental Policy Act has long been applied in many biodiversity-related contexts).

[53] 40 C.F.R. § 1508.14 (2010) (providing that the term "human environment" under the U.S. NEPA "shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment").

[54] *See generally* 42 U.S.C. § 4332(2) (2010).

[55] 42 U.S.C. § 4321 (2010).

[56] 42 U.S.C. § 4332(2)(F)-(H) (2010).

[57] 40 C.F.R. §§ 1500.3-6 (2010).

[58] *See* CEQ, *supra* note 47.

[59] 40 C.F.R. § 1508.27 (2010).

[60] *See, e.g.*, *Ctr. for Biological Diversity v. Nat'l Highway Transp. Safety Admin*, 508 F.3d 508, 523, 550 (9th Cir. 2007) (holding that environmental assessment under NEPA inadequate for failing to discuss and analyze the cumulative impact of motor vehicle efficiency standards on global warming because, *inter alia*, "recent evidence shows that there have already been severe impacts in the Arctic due to warming, including sea ice decline.").

[61] *See* 5 U.S.C. § 552 (2010) (establishing a foundation of open government in the United States that acts, with strict exceptions, as a world model and would advance U.S. and democratic interests if implemented at the CBD for biological resources).

[62] U.S. Council on Environmental Quality Regulations, 40 C.F.R. § 1500.1 (2010) ("NEPA procedures must insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. The information must be of high quality. Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing" NEPA or any other sustainable development project. And, ultimately, the goal "is not to generate paperwork – even excellent paperwork – but to foster excellent action.").

[63] CBD, *supra*, note 1, art. 2 (providing that all legal, scientific, economic, and technical information feeds into a pattern of inevitable "use of components of biological diversity," ideally "in a way and at a rate that does not lead to the long-term decline of biological diversity").

[64] *Id.* art. 14.1 (c), (d) (focusing on impacts and information to other countries).

[65] *See id.* arts. 15.4, 15.7, 16.2, 16.3, 19.2.

[66] *Id.* arts. 15.5, 19.3.

[67] Richard Blaustein, *Genetic Resources and the Convention on Biological Diversity*, 56 Bioscience 560, 560 (2006).

[68] *See* Catherine J. Tinker, *Introduction to Biological Diversity: Law, Institutions, and Science*, 1 Buff. J. Int'l Law 1, 16 (1994).

[69] CBD, *supra* note 1, art. 15.2.

[70] *See id.* arts. 16.2, 16.3, 16.5.

[71] *Id.* art. 19.1.

[72] *See generally* Raffaelo Gervigni, *Incremental Cost in the CBD*, Environmental and Resource Economics 11: 217-241 (1998).

[73] CBD, *supra* note 1, art. 20.2.

[74] *See* Secretariat of the Convention on Biological Diversity, Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization iv (2002), http://www.cbd.int/doc/publications/cbd-bonn-gdls-en.pdf (last visited Apr. 19, 2010) ("The Guidelines identify the steps in the access and benefit-sharing process, with an emphasis on the obligation for users to seek the prior informed consent of providers. They also identify the basic requirements for mutually agreed terms and define the main roles and responsibilities of users and providers and stress the importance of the involvement of all stakeholders. They also cover other elements such as incentives, accountability, means for verification and dispute settlement. Finally, they enumerate suggested elements for inclusion in material transfer agreements and provide and indicative list of both monetary and non-monetary benefits.").

[75] International Treaty on Plant Genetic Resources, art. 1.1, *opened for signature* Nov. 3, 2001, [hereinafter ITPGR]. *See also* ITPGR, arts. 10-13.

[76] *See generally* David Cooper, *International Treaty on Plant Genetic Resources for Food and Agriculture*, RECEIL, Vol. 11(1), at 1-16 (2002).

[77] *See also* Access and Benefit Sharing Alliance (ABSA), Objectives, Scope, Compliance, Fair and Equitable Sharing of Benefits, and Access in the ABS International Regime (2008); Richard Blaustein, *The United States and the CBD after the WSSD,* Science, Technology and Innovation Viewpoints, July 28, 2003.

[78] *See generally* S. Rep. No. 103-30, at 4.

[79] *See generally* Bruce Stein et al., Precious Heritage: The Status of Biodiversity in the United States (2000) (assessing U.S. biological diversity; updated data at www.natureserve.org (last visited Apr. 18, 2010)); U.N. Environment Programme, Global Biodiversity Assessment (1995) (assessing biodiversity at the global level; for updated assessments, *see* http://earthwatch.unep.net/biodiversity/index.php (last visited Apr. 18, 2010)); Jared Diamond, Collapse (2005); David Quammen, The Song of the Dodo (1996); David Quammen, Monster of God (2003); and Charles Bergman, Red Delta (2002) (highlighting both global and U.S. biodiversity treasures and loss).

[80] G.A. Res. 61/203, U.N. GAOR, 61st Sess., U.N. Doc. A/RES/61/203 (Jan. 19, 2007). *See also* 2010 Biodiversity Target, CBD, http://www.cbd.int/2010-target/ (last visited Apr. 19, 2010) ("To achieve, by 2010, a significant reduction of the current rate of biodiversity loss at the global, regional, and national level, as a contribution to poverty alleviation and to the benefit of all life on Earth."); "Carta di Siracusa" on Biodiversity, G8, Environment Ministers Meeting, Apr. 22, 2009; Blake M. Mensing, *Countdown 2010, All Eyes on Oryza: The Current Access and Benefits-Sharing Provisions of International Instruments Will Keep the 2010 Biodiversity Target Out of Reach*, 7:1 SCRIPTed

166, 168 (2010), *available at* http://www.law.ed.ac.uk/ahrc/script-ed/vol7-1/mensing.asp.

[81] *See, e.g.*, Michael Scott, Dale Goble & Frank Davis, The Endangered Species Act at Thirty: Renewing the Conservation Promise (2006); Michael Scott, Dale Goble & Frank Davis, Conserving Biodiversity in Human-Dominated Landscapes (2006) (examining the core conservation challenges in the United States).

[82] *See, e.g.*, International Centre for Trade and Sustainable Development, *Where Does TRIPS Go From Here?,* Intellectual Property Programme, Aug. 7, 2008, http://ictsd.org/i/news/bridgesweekly/18031/ (last visited Apr. 18, 2010) ("Specific questions that would need to be worked out include how to avoid erroneous patents using genetic resources; how to bring national regimes into compliance on prior informed consent and access and benefit sharing on mutually agreed terms; how patent offices would be equipped with the necessary information to deal with the patentability issues in these areas; and whether the patent system should maintain its role as a provider of innovation incentives.")

[83] *See* President's Message to the U.S. Senate transmitting the CBD, Weekly Comp. Pres. Doc. (Nov. 19, 1993); S. Rep. No. 103-30, at 4, 23.

[84] *See* Letter from Republican Senators to Senate Majority Leader George Mitchell (Aug. 5, 1994); Response from the State Department to letter from Republican Senators to Senate Majority Leader George Mitchell (Aug. 8, 1994) (on file with author).

[85] Topics addressed in the MOR included: Benefits to Agriculture, Private Sector Involvement, The Convention may not be used in place of U.S. Laws, The Convention does not prevent Amendment of Environmental Legislation, The Convention does not Provide for a Private Right of Action, No Binding Dispute Resolution, Effect of Amendments or Protocols on the United States.

[86] *See* S. Rep. No. 103-30, at 23.

[87] *See Id.* (Protecting intellectual property rights and technology transfer "These understandings make clear that the Convention cannot be used as a vehicle for compulsory technology transfer and that access to technology and patents must be consistent with the 'adequate and effective protection of intellectual property rights.'").

[88] CBD, *supra* note 1, art. 15.5. *See, e.g.*, Adrian Casas, *Prior Informed Consent in the Convention on Biological Diversity – Bonn Guidelines: National Implementation in Colombia*, Sustainable Dev. L. & Pol'y, Summer 2004, at 27-28.

[89] *See* CBD, *supra* note 1, art. 19.1; International Treaty on Plant Genetic Resources for Food and Agriculture (2009), *available at* ftp://ftp.fao.org/docrep/fao/011/i0510e/i0510e.pdf.

[90] The central issue for the U.S. biotechnology industry has changed from whether the CBD harms its interests to how best to engage with the CBD.

[91] *See, e.g.,* National Research Council Report Examines Biotechnology's Benefits for U.S. Farmers, Biotechnoloy Industry Organization, http://www.bio.org/news/pressreleases/newsitem.asp?id=2010_0414_05 (last visited Apr. 18, 2010); *see generally* Biotechnoloy Industry Organization, http://www.bio.org (last visited Apr. 20, 2010).

[92] *See e.g.,* S. Rep. No. 103-30, at 35 (showing that Merck and Co., Inc., told the Senate in a 1994 letter supporting ratification of the Biodiversity Treaty that, "the loss of biodiversity could literally mean lost opportunities for researching the mechanisms of disease and discovering some important new medicines. Plants, insects, microorganisms and marine organisms have yielded some of the greatest pharmaceutical breakthroughs of this century."); *Id.* at 28-29 (highlighting that the American Seed Trade Association told the Senate of its "fundamental support for ratification of this important intellectual property rights document."); *Id.* at 36 (demonstrating that the Biotechnology Industry Organization said it "believes that the key element of a fair and balanced Biodiversity Convention is recognition of the value of the products of nature, as well as the contributions made by persons and institutions that modify those products into useful articles of commerce.").

[93] Convention on Biological Diversity, Conference of the Parties, Ninth Meeting, Decision IX/12 (May 19, 2008), *available at* http://www.cbd.int/decision/cop/?id=11655 [hereinafter COP 9].

[94] World Trade Organization, Ministerial Declaration of 14 November 2001, WT/MIN/(01)/DEC/1, 41 I.L.M. 746, at para. 19 (2002).

[95] S. Rep. No. 103-30, at 22 ("The committee notes that a further safeguard is contained in the Convention's requirement that financial assistance be limited to cover 'agreed full incremental costs.' Thus costs are limited to those projects that are agreed between the GEF and the developing country, a process which, as the administration has noted in the response to committee questioning 'will be driven in part by the availability of resources in GEF to fund such projects.'").

[96] *Id.* at 21-22 ("The United States will meet its financial obligation under the Convention through voluntary contribution to the Global Environment Facility. The amount of the contribution will be determined through negotiations in which the United States has an effective veto over funding levels that it deems excessive. Moreover, this contribution itself requires a statutory appropriation, in which the Senate must affirmatively concur. Thus, the Senate will have an opportunity to participate fully in deciding the level of the U.S. financial contributions under the Convention.").

[97] *Id.*, at 23.

[98] *But see id.*, at 26-27 (showing the *only* formal opposition to the Treaty filed before the Congress was the Minority Report of Senators Helms, Pressler, and Coverdell, the three Republican members of the Senate who had voted against the CBD for the "vague and unfinished nature of the treaty" when successfully reported out of the Foreign Relations Committee 16-3).

[99] United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 397 (comprising customary international law and consisting of rights and responsibilities to use oceans, defines territorial vs. non-territorial waters, including the term "continental shelf," and establishing guidelines for the marine environment and associated natural resources). *See, e.g.*, Pew Oceans Commission, America's Living Oceans: Charting a Course for Sea Change 80-81 (2003) (discussing the importance of both the UNCLOS and CBD for long-term ocean conservation).

[100] Statement of Jeffrey Burnam, Assistant Secretary of State (Apr. 17, 2002).

[101] *See, e.g.*, Remarks to the Corporate Council on Africa's U.S.-Africa Business Summit, 39 Weekly Comp. Pres. Doc. 759, 820 (June 26, 2003) (highlighting opportunities for agricultural biotechnology to alleviate hunger and enhance agriculture in Africa); Dr. Ahmed Djoghlaf, CBD Executive Secretary, World Food Security: The Challenges of Climate Change and Bioenergy (2008); Elizabeth Shelburne, *The Next Breadbasket?: How Africa Could Save the World – And Itself*, The Atlantic, at 72-73 (2009).

[102] Letter from Assistant Secretary of State Wendy Sherman to Senate Majority Leader George Mitchell (Aug. 8, 1994).

[103] *See* Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, http://ipbes.net (last visited Apr. 18, 2010); *See also* The Economics of Ecosystems and Biodiversity, http://teebweb.org (last visited Apr. 18, 2010) (drawing attention to the economic benefits of healthy natural services).

[104] Peer review process for ABS studies commissioned in accordance with decision IX/12, paragraph 13(a), (b) and (e), Convention on Biological Diversity, *available at* http://www.cbd.int/abs/peerreview/.

[105] *See, e.g.,* Convention on Biological Diversity [CBD], Ad Hoc Open-Ended Working Group on Access and Benefit-Sharing*,* CBD Doc. UNEP/CBD/WG-ABS/7/3 (Feb 10, 2009); Valuing Local Knowledge: Indigenous People and Intellectual Property Rights (Stephen Brush & Doreen Stabinsky, eds., 1996).

[106] Convention on Biological Diversity, Conference of the Parties, Sixth Meeting, Decision VI/24 (Apr. 7, 2002), *available at* http://www.cbd.int/decision/cop/?id=7198. *See, e.g.,* Convention on Biological Diversity, Ad Hoc Open-Ended Working Group on Access and Benefit-Sharing*,* CBD Doc. UNEP/CBD/WG-ABS/5/INF/2 (July 20, 2007); Draft Programme, United Nations Environment Program, First Pan-African Workshop on ABS and Forests (June 22, 2009), *available at* http://www.unep.org/environmentalgovernance/LinkClick.aspx?fileticket=MiHTrVnLCIc%3D&tabid=385&language=en-US; Santiago P. Soplin & Manuel Ruiz Muller, *The Development of an International Regime on Access to Genetic Resources and Fair and Equitable Benefit Sharing in the Context of New Technological Developments,* Initiative for the Prevention of Biopiracy, April 2009, http://www.biopirateria.org/documentos/Serie%20Iniciativa%2010.pdf (last visited Apr. 19, 2010).

[107] Blaustein, *Genetic Resources and the CBD*, *supra* note 67, at 563 (quoting James Miller, Missouri Botanical Garden).

[108] *See* Fifth Meeting of the Conference of the Parties serving as the Meeting of the Parties to the Cartagena Protocol on Biosafety (COP-MOP 5), http://www.cbd.int/doc/?meeting=MOP-05 (last visited Apr. 18, 2010) (including topics such as: Access and Benefit Sharing, Strategic issues including 2010 biodiversity targets, Inland waters biodiversity, Marine and coastal biodiversity, Mountain biodiversity, Protected areas, Sustainable use of biodiversity, Biodiversity and climate change, Forest biodiversity, Invasive alien species, Global Taxonomy Initiative, Incentive measures, and others.).

[109] *See, e.g.*, Administrative Procedure Act, 5 U.S.C. § 702 (2010) (requiring waiver of sovereign immunity for federal government to be sued in court).

[110] *See, e.g.*, Marjo Vierros, *The Convention on Biological Diversity: Moving From Policy to Implementation*, Sustainable Dev. L. & Pol'y, Fall 2006, at 17-20.

[111] *See* IUCN, Report of the Eleventh Global Biodiversity Forum: Exploring Synergy Between the UN Framework Convention on Climate Change and the Convention on Biological Diversity (1999).
[112] *See, e.g.*, Sovereignty International, Inc., How the Convention on Biodiversity was Defeated (1998) (hyping "land use policies required by the treaty"). *See also* Letter from Bob Stallman, President, American Farm Bureau Federation to Secretary of State Colin Powell (Nov. 11, 2004) (opposing biosafety protocol that the U.S. never needs to sign under the CBD).
[113] *See generally* Tony Whitten et al., The World Bank and Biodiversity Conservation (2008); E. Castro et al., Mapping Conservation Investments (2001).
[114] *See* Convention on Biological Diversity, Ad Hoc Open-Ended Working Group Review of Implementation of the Convention, CBD Doc. UNEP/CBD/WG-RI/2/5 (May 16, 2007) (funding for biodiversity projects have already been approved by the GEF Council for countries such as Cameroon, Colombia, Ecuador, Honduras, Mexico, Caribbean Islands, and Pacific Islands).
[115] *See* S. Rep. No. 103-30, at 21-22 (deliberating on question of cost and selection of financial mechanism); *see generally* Global Environment Facility, http://www.gefweb.org/biodiversity (last visited Apr. 20, 2010); Senate Question/Answer No. 3.
[116] *See* Letter from Assistant Secretary of State Richard Verma to Senate Foreign Relations Committee John Kerry (May 11, 2009).
[117] *See* ITPGR, Annex I (listing of crops covered under the Multilateral System); ITPGR Standard Material Transfer Agreement, art. 15.
[118] President George W. Bush transmitted the ITPGR for ratification on July 7, 2008. Transfers under this "multilateral system" are to be accompanied by a standard material transfer agreement, the current version of which was concluded in June 2006. Provision of plant genetic resources from U.S. gene banks is fully consistent with the Department of Agriculture's long-standing general practice of providing access to such plant genetic resources upon request. Ratification of the treaty will provide U.S. agricultural interests with similar access to other parties' gene banks, thus helping U.S. farmers and researchers sustain and improve their crops and promote food security. The Treaty may be implemented under existing U.S. authorities.
[119] *See* CBD, *supra* note 1, art. 32; The United States participated in the negotiation of the text and the subsequent preparations for entry into force under the Protocol, as well as its first COP. Article 32 of the CBD makes it clear not only that non-parties to the treaty cannot be parties to the protocol, but also that parties to the treaty can also choose not to be parties to a CBD protocol. In any event, the Biosafety Protocol is essentially limited to: a) advanced informed agreements for living modified organisms ("lmo") to be introduced into the environment; b) lmos commodities need documentation of lmo possibility in shipment; and c) a savings clause stating that existing international agreements on intellectual property rights or liability are presumed unchanged.
[120] It should be noted that in October 2000, the U.S. got beyond gridlock and ratified 34 treaties by unanimous consent including the CBD-related Desertification Convention. This demonstrates progress can be made.
[121] Ahmed Djoghlaf, Executive Secretary, Convention of Biological Diversity, Statement at the United Nations Information Centres Seminar on the International Year of Biodiversity (Mar. 2, 2010), *available at* http://www.cbd.int/doc/speech/2010/sp-2010-03-02-unic-en.pdf (quoting Prime Minister Yukio Hatoyama of Japan, "Our modern industrial activities and lifestyles have brought a wealth of benefits to our lives; at the same time, though, we must realize that they are also shortening the time remaining for humans to continue living the civilized lives they do today.").

Endnotes: Livestock Animal Cloning: This Steak is Giving Me Déjà Vu *continued from page 18*

[10] *Id.* (emphasizing that a clone is like a genetic twin born at a different time and therefore this process should not be equated with genetic engineering).
[11] ScientificAmerican.com, Are We Eating Cloned Meat?, http://www.scientificamerican.com/article.cfm?id=are-we-eating-cloned-meat (last visited Apr. 5, 2010) (reporting that critics of the FDA's findings emphasize that the University of Connecticut study that the FDA relied on, only evaluated the meat and milk of six animals and that more studies were necessary to evaluate the risks posed by cloned animal products).
[12] Center for Food Safety, et al., Citizen Petition Before the United States Food and Drug Administration, Petition Seeking Regulation of Cloned Animals, (Oct. 12, 2006), *available at* http://www.centerforfoodsafety.org/pubs/ cloned_animal_petition10-12-06.pdf (emphasizing the scientific uncertainty about the effect animal cloning will have on disease rates).
[13] *See id.* (making its request under the U.S. Constitution, the Administrative Procedure Act, and the FDA's own regulations).
[14] *See* Federal Food, Drug, and Cosmetic Act, 21 U.S.C. § 360 (2007) (laying out the requirements imposed by the act, including a rigorous pre-market review process that would analyze the potential risks posed by animal cloning).
[15] Andrea Thompson, *Cloned Milk and Meat: What's the Beef?*, Live Sci., Jan. 9, 2008, http://www.livescience.com/health/080109-animal-cloning.html (quoting Jaydee Hanson, a spokesman for the Center for Food Safety, who pointed out the industry participation and noted that though the studies did not reveal anything harmful in the cloned meat that "[w]e shouldn't see what the effects are by going ahead and feeding them to humans just in case there aren't any," and that the FDA's risk assessment was poorly done).
[16] *Compare* U.S. Food and Drug Admin., Animal Cloning: A Risk Assessment, Jan. 15, 2008, http://www.fda.gov/downloads/AnimalVeterinary/SafetyHealth/AnimalCloning/UCM124756.pdf (last visited Apr. 12, 2010) *with* Michael Hansen, Comments of Consumers Union to US Food and Drug Administration on Docket No. 2003N-0573, Draft Animal Cloning Risk Assessment, http://www.consumersunion.org/pdf/FDA_clone_comments.pdf (last visited Apr. 12, 2010) (attacking the FDA because its "conclusions of safety appear to be based on data on milk from 43 cow clones, and data on beef from 16 cow clones, and 5 pigs.").
[17] Biotechnology Industry Organization, Lobbying Disclosure Report for Q1 of 2008, *available at* http://disclosures.house.gov/ld/pdfform.aspx?id=300058671 (listing FDA Risk Assessment on Cloning, H.R. 992, and S. 414 as part of the Biotechnology Industry Organization's lobbying efforts).
[18] *See* Heidi Stevenson, Bananas Are Dying, Killed by Corporate Monoculture, (June 2, 2008), http://www.naturalnews.com/023339_banana_bananas_disease.html (outlining how monocropping caused the extinction of an entire species of banana by exposure to Panama disease).
[19] EPA.gov, Regulatory Definitions of Large CAFOs, Medium CAFOs, and Small CAFOs, http://www.epa.gov/npdes/pubs/sector_table.pdf (noting the categorical minimum numbers of confined animals for an industrial farm, including the staggering number of 125,000 chickens to earn the large CAFO label).
[20] *See, e.g.*, Ephraim Leibtag, Amber Waves, *Corn Prices Near Record High, But What About Food Costs?* (Feb. 2008), *available at* http://www.ers.usda.gov/AmberWaves/February08/Features/CornPrices.htm (stating that on average it takes "7 pounds of corn to produce 1 pound of beef, 6.5 pounds of corn to produce 1 pound of pork, and 2.6 pounds of corn to produce 1 pound of chicken.").
[21] SierraClub.org, Concentrated Animal Feeding Operations, Human Health, Community and Environmental Impacts, http://iowa.sierraclub.org/CAFO_impacts.pdf (last visited Apr. 7, 2010) (stating that "[b]ecause CAFOs concentrate large numbers of animals close together, they facilitate rapid transmission and mixing of viruses.").
[22] *See id.* (citing the Union of Concerned Scientist's estimate that eighty-seven percent of the antibiotics used in the U.S. are fed to livestock).
[23] *See* MacKenzie, *supra* note 7 (laying out how reductions in biodiversity results in the increase of disease rates); Physicians for Social Responsibility, U.S. Meat Production, http://www.psr.org/chapters/oregon/safe-food/industrial-meat-system.html (last visited Apr. 7, 2010) (describing how the host mothers of cloned animals require an increase in antibiotics and discussing how antibiotic-resistant diseases are being incubated in CAFOs); Convention on Biological Diversity, Biodiversity and Agriculture 12 (2008) (presenting data gathered by the Food and Agriculture Organization that shows that "less than 14 species—including cattle, goats, sheep, buffalo and chickens—account for 90% of global livestock production.). The report also noted that in recent years there has been "alarming genetic erosion within these species" and that a breed is being lost each month. *Id.*
[24] *See* Friends of the Earth, Cloned Food: What it Means to Eat Meat and Dairy from Cloned Animals, http://www.foe.org/sites/default/files/FOE_Cloned_Food_Factsheet.pdf (reiterating that monogenetic livestock herds are at risk of high losses due to the lack of biodiversity's protection).
[25] David Gutierrez, *FDA Admits Cloned Meat, Milk May Have Already Entered Food Supply*, Nat. News, Jan. 29, 2009, http://www.naturalnews.com/025467_food_meat_cloned.html (last visited Apr. 12, 2010) (emphasizing that the voluntary ban on cloned animal products did not include a clone's offspring and that those products could have made their way onto American dinner plates).

[26] *See* Press Release, Mikulski Renews Call for Labeling of Cloned Food (Jan. 22, 2008), http://mikulski.senate.gov/record.cfm?id=290888 (last visited Apr. 12, 2010) (mentioning DeLauro's companion bill in the discussion of Senator Mikulski's original introduction of the Cloned Food Labeling Act).
[27] Cloned Food Labeling Act, S. 414, 110th Cong. (2007), *available at* http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=110_cong_bills&docid=f:s414is.txt.pdf.
[28] *See id.*
[29] *See* Findarticles.com, Business Wire, *BIO Says*, *Proposed 'Cloned Food Labeling Act' Will Mislead Consumers*, http://findarticles.com/p/articles/mi_m0EIN/is_2007_Jan_26/ai_n17155461/ (Jan. 26, 2007) (quoting BIO's CEO and President's reaction to the introduction of the Cloned Food Labeling Act, "[l]abels that are misleading to consumers are unlawful. To require the labeling of foods that are indistinguishable from foods produced through traditional methods–as Sen. Mikulski's proposal does–would mislead consumers by falsely implying differences where none exist. It also risks diverting attention from important safety and nutritional information."). *See also* BIO Fact Sheet, *supra* note 4 (revealing that the major animal cloning technology companies are planning to create a clone registry to provide an option for clone-free claims to be verified, but emphasizing that this registry is meant to preserve consumer choice rather than being based on safety or nutritional concerns).
[30] *See* Govtrack.us, S. 414: Cloned Food Labeling Act, http://www.govtrack.us/congress/bill.xpd?bill=s110-414 (last visited Apr. 12, 2010) (showing that the last action taken on the Cloned Food Labeling Act was its referral to committee).
[31] *See* Govtrack.us, H.R. 992: Cloned Food Labeling Act, http://www.govtrack.us/congress/bill.xpd?bill=h110-992 (last visited Apr. 12, 2010) (laying out the status of the House version of the Cloned Food Labeling Act).
[32] *See Pew Initiative Poll: Americans' Knowledge of GM Foods Remains Low* (Nov. 7, 2005), *available at* http://pewagbiotech.org/research/2005update/ (indicating that two thirds of Americans are uncomfortable with animal cloning). *See also* Gutierrez, *supra* note 25 (listing Smithfield Foods, General Mills, Campbell Soup, Nestle, California Pizza Kitchen, Supervalu, Kraft Foods and Tyson Foods, as companies that have pledged not to use cloned animal products based on polling showing that the majority of consumers do not want to eat cloned animal products).
[33] Bruce I. Knight, Under Secretary, U.S. Dep't Agric., Animal Cloning: Transitioning from the Lab to the Market 3-4 (Mar. 5, 2008), *available at* http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5067983 (outlining the steps the National Organic Program and the National Organic Standards Board have taken to list animal cloning technology in the "Excluded Methods" of the national organic labeling program).
[34] Tiffany Sharples, *Your Steak — Medium, Rare or Cloned?*, Time, Feb. 17, 2008, http://www.time.com/time/health/article/0,8599,1714146,00.html?imw=Y (stating that the high cost will most likely mean that people will not be eating a clone directly, but rather their offspring).

Endnotes: Endocrine-Disrupting Chemical Pollution *continued from page 22*

[1] Petition for Water Quality Criteria for Endocrine Disrupting Chemicals Before the EPA, Center for Biological Diversity (Jan. 10, 2010), *available at* http://www.biologicaldiversity.org/campaigns/pesticides_reduction/endocrine_disruptors/pdfs/EPA_304_EDC_petition.pdf.
[2] Nat'l Inst. of Envl. Health Sciences ("NIEHS"), Environmental Agents: Endocrine Disruptors, http://www.niehs.nih.gov/health/topics/agents/endocrine/ (last visited Apr. 12, 2010).
[3] *Id.* (providing studies, reports, and general information).
[4] *See* NIEHS, Endocrine Disruptors 1 (2007) http://www.niehs.nih.gov/health/docs/endocrine-disruptors.pdf (providing an overview of how endocrine disrupters function) (last visited Apr. 20, 2010).
[5] *See id.*
[6] *See id.*
[7] 33 U.S.C. § 1251(a) (2006).
[8] 33 U.S.C. § 1251(a)(2).
[9] 33 U.S.C. §§ 1313-1314.
[10] 33 U.S.C. § 1314(a)(1).
[11] 33 U.S.C. § 1314(a)(2).
[12] 33 U.S.C. § 1313(a)(3).
[13] Water Quality Standards, 40 C.F.R. § 131.6 (2010).
[14] 40 C.F.R. § 131.11(b).
[15] 33 U.S.C. § 1313(d)(1)(A).
[16] 33 U.S.C. § 1313(d)(1)(C).
[17] 33 U.S.C. § 1314(a)(1).
[18] *See* Our Children's Earth Found. v. EPA, 506 F.3d 781, 785 (9th Cir. 2007) (holding that the EPA does not have discretion to ignore the technology-based criteria).
[19] *See, e.g.,* Christian G. Daughton, *"Emerging" Chemicals as Pollutants in the Environment: a 21st Century Perspective*, 23 Renewable Res. J. 6 (2005) (discussing the emergence of new chemical pollutants).
[20] *See generally Pharmaceuticals in the Nation's Water: Assessing Potential Risks and Actions to Address the Issue: Hearing Before the Subcomm. on Trans. Safety, Infrastructure Sec., & Water Quality of the S. Comm. on Env't & Pub. Works*, 111th Cong. (2008) (statement of J. Sass, Senior Scientist, Nat. Res. Def. Council) [hereinafter Sass Testimony] (providing general information on PPCPs); Daughton, *supra* note 19; Mark Alpert, *Fighting Toxins in the Home: Everyday Materials May Pose Health & Environmental Threats*, 298 Sci. Am. 46 (2008).
[21] *See* NIEHS Report, *supra* note 4, at 1-2 (describing some products and chemicals that contain EDCs).
[22] *See* Sass Testimony, *supra* note 20, at 8-9 (discussing health risks of low dose exposure to EDCs).
[23] *See id.,* at 2-4 (discussing the ways in which EDC's enter the environment).
[24] *See id*.
[25] "Spray-drift" describes the phenomenon of pesticides drifting beyond the area to which they were intended to be applied. *See* U.S. EPA, Pesticides: Topical & Chemical Fact Sheets: Pesticide Spray and Dust Drift, (Dec. 2009), http://www.epa.gov/pesticides/factsheets/spraydrift.htm (last visited Apr. 20, 2010).
[26] *See* OW/ORD Emerging Contaminants Workgroup, *Aquatic Life Criteria for Contaminants of Emerging Concern, Part I, General Challenges and Recommendations*, 2-4 (EPA, White Paper, June 3, 2008) (explaining why EPA is concerned with CECs), *available at* http://www.epa.gov/waterscience/criteria/library/sab-emergingconcerns.pdf [hereinafter EPA White Paper].
[27] *See* Sass Testimony, *supra* note 20, at 2-4 (discussing the source of PPCP's and the ways in which they enter the environment).
[28] *See, e.g., id.* (discussing the detection, *inter alia*, of antibiotics, anti-convulsants, mood stabilizing drugs, and pharmaceuticals and personal care products).
[29] *See, e.g.*, *id.*, at 2-5 (discussing health effects on animals and humans).
[30] Jeff Donn, Martha Mendoza & Justin Pritchard, *Pharmaceuticals Lurking in U.S. Drinking Water*, Associated Press, Mar. 10, 2008, http://www.msnbc.msn.com/id/23503485/ (last visited Apr. 20, 2010).
[31] *Id.*
[32] *See* Jennifer A. Jenkins, et al., Effects of Wastewater Discharges on Endocrine and Reproductive Function of Western Mosquitofish (*Gambusia* spp.) and Implications for the Threatened Santa Ana Sucker (*Catostomus santaanae*), 2 (U.S. Dept. of Interior & U.S. Geological Survey Open-File Report 2009-1097) (rev. May 2009), *available at* http://pubs.usgs.gov/of/2009/1097/pdf/OF2009-1097.pdf.
[33] Robert J. Gilliom, et al., The Quality of Our Nation's Waters—Pesticides in the Nation's Streams and Ground Water 1992-2001, 9 (U.S. Geological Survey, Circular 1291, 2007), *available at* http://pubs.usgs.gov/circ/2005/1291/pdf/circ1291_front.pdf.
[34] *Id.*
[35] Endangered Species Act, 16 U.S.C. §§ 1531-1544 (2006).
[36] 16 U.S.C. § 1532(19).
[37] 50 C.F.R. §17.3.
[38] *See generally* Susan Jobling, *et al.*, *Wild Intersex Roach (*Rutilus rutilus*) Have Reduced Fertility*, 67 Biology of Reprod. 515, 515 (2002) (finding that EDC-caused altering of sex characteristics leads to reduced reproductive ability).
[39] *See, e.g.,* J.M. Lazorchak & M.E. Smith, *National Screening Survey of EDCs in Municipal Wastewater Treatment Effluents*, EPA/600/R-04/171 (2004); Karl Fent, et al., *Review: Ecotoxicology of Human Pharmaceuticals*, 76 Aquatic Toxicology 122 (2006).
[40] Jenkins *et al*., *supra* note 32, at 2 (summarizing that the greatest exposure and effect of EDC's was found at wastewater effluent sources).

[41] Jenkins *et al*., *supra* note 32, at 39
[42] Jenkins *et al*., *supra* note 32, at 39.
[43] Jenkins *et al*., *supra* note 32, at 39.
[44] *See* Peter L. Turtle & Erik L. Orsak, Las Vegas Wash Water Quality and Implications to Fish and Wildlife 4-5 (U.S. Fish & Wildlife Serv., FFS No. 1F27 and 1F31, Nov. 1, 2002), *available at* http://www.fws.gov/pacific/ecoservices/envicon/pim/reports/LasVegas/LasVegasWash/Final_Las_Vegas_Wash_Study.pdf.
[45] *Id.* at 4.
[46] *Id.* at 28.
[47] *Id*. at 29.
[48] *Id.* at 32.
[49] *Id.* at 29.
[50] United States Geological Service, *Endocrine Disruption in Lake Mead*, http://nevada.usgs.gov/water/projects/mead_endocrine.htm (last visited May 3, 2010).
[51] Endangered and Threatened Wildlife and Plants; Determination of Endangered Status and Critical Habitat for the Desert Pupfish, 50 C.F.R. § 17 (1986).
[52] 50 C.F.R. § 17.
[53] *See* Jennifer A. Jenkins & Rassa O. Draugelis-Dale, Bioindicators from Mosquitofish (*Gambusia affinis*) Sampled from the Imperial Valley in Southern California, 1 (U.S. Geological Survey Open-File Report 2006-1307, 2006).
[54] *Id.*
[55] S.L. Goodbred, et al., Evidence of Endocrine Disruption in Western Mosquitofish (*Gambusia affinis*), 93 (Imperial Valley, California, U.S. Fish & Wildlife Serv., 2006).
[56] *See* Jenkins, *supra* note 33, at 20-21.
[57] *See id.* at 10.
[58] *Id.* at 38.
[59] Jennifer Adibi, et al., *Maternal Urinary Metabolites of Di-(2-Ethylhexyl) Phthalate in Relation to the Timing of Labor in a U.S. Multicenter Pregnancy Cohort Study*, 169 Am. J. Epidemiology, 1015, 1015 (2009).
[60] *See id.*
[61] Gayle C. Windham, et al., *Exposure to Organochlorine Compounds and Effects on Ovarian Function*, 16 Epidemiology182, 182 (2005).
[62] Heidi Blanck, et al., *Age at Menarche and Tanner Stage in Girls Exposed In Utero and Postnatally to Polybrominated Biphenyl*, 11 Epidemiology 641, 641 (2000).
[63] Michele Marcus, *The Michigan PBB Cohort 20 Years Later: Endocrine Disruption?* 1 (2000), *available at* http://www.epa.gov/ncer/science/endocrine/pdf/humanhealth/r825300_marcus_0415.pdf.
[64] Ida N. Damgaard, et al., *Persistent Pesticides in Human Breast Milk and Cryptorchidism*, 114 Envtl. Health Perspectives 1133, 1133 (2006).
[65] Victoria Holt, et al., Final Report: Persistent Organic Pollutants and Endometriosis Risk, (U.S. EPA 2007), *available at* http://cfpub.epa.gov/ncer_abstracts/index.cfm/fuseaction/display.abstractDetail/abstract/2361/report/F.
[66] Neculai Codru, et al., *Diabetes in Relation to Serum Levels of Polychlorinated Biphenyls and Chlorinated Pesticides in Adult Native Americans*, 115 Envtl. Health Perspectives 1442, 1442 (2007).
[67] EPA White Paper, *supra* note 26, at 2.
[68] EPA, Water Quality Standards Handbook 3-3 (2nd ed. 1994), *available at* http://www.epa.gov/waterscience/standards/handbook/handbookch3.pdf.
[69] *See id.*
[70] *Id.* at 3-4.
[71] *See* Emily Willingham, *Endocrine-Disrupting Compounds and Mixtures: Unexpected Dose-Response*, 46 *Archives of Envtl. Contamination & Toxicology* 265, 265 (2004) (finding that small doses can result in large changes when combined with other compounds).
[72] Charles E. Stephan, et al., Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses, 18 and 57 (U.S. EPA, 1985).
[73] *Id.*
[74] Andrea C. Gore, et al., *Endocrine Disruption for Endrocrinologists (and Others)*, 147 Endocrinology S1, S1 (2006).
[75] Stephan, *supra* note 72, at 54.
[76] *Notice of Availability of Final Aquatic Life Criteria Document for Tributyltin*, 69 Fed. Reg. 342, 343 (Jan. 5, 2004).
[77] *Id.*
[78] *See* Notice, *id*. (noting tributyltin's toxicity).
[79] EPA White Paper, *supra* note 27, at 3.
[80] Stephan, *supra* note 72, at 27.
[81] *See* 33 USC §§ 1314(a)(1)-(2) (mandating that the EPA periodically update its water quality criteria to "reflect the latest scientific knowledge").

Endnotes: Using the Clean Water Act to Protect Our Oceans' Biodiversity *continued from page 23*

[1] *See* Michael B. Gerrard, *Introductory Comments: The Current State of Climate Change Law*, Sustainable Dev. L. Pol'y, Winter 2010, at 2.
[2] *See* Petition, Center for Biological Diversity, Petition for Revised pH Water Quality Criteria under Section 304 of the Clean Water Act, 33 U.S.C. § 1314, to Address Ocean Acidification (Dec. 18, 2007), 1, *available at* http://www.biologicaldiversity.org/programs/oceans/pdfs/section-304-petition-12-18-07.pdf [hereinafter Petition].
[3] *See* Clean Water Act Section 303(d): Notice of Call for Public Comment on 303(d) Program and Ocean Acidification, 75 Fed. Reg. 13538 (Mar. 22, 2010), [hereinafter Call for Public Comment].
[4] *See* Petition, *supra* note 2 at 6.
[5] *See id.*
[6] *See* Sarah R. Cooley & Scott C. Doney, *Anticipating ocean acidification's economic consequences for commercial fisheries*, Environmental Research Letters (2009), 2-3, *available at* http://iopscience.iop.org/1748-9326/4/2/024007/.
[7] *See id.* at 2-5 (explaining that the loss of revenue from depleted fish stocks would jeopardize the jobs of fishermen, those who buy their catch to sell, and the travel and recreation industries that rely on marine biodiversity to attract tourists).
[8] *See* Petition, *supra* note 2 at 1.
[9] *See id.* at 2.
[10] *See* Press Release, Center for Biological Diversity, EPA Agrees to Review Ocean Acidification Impacts Under Clean Water Act: Agency Will Analyze Effects of CO2 Emissions on Water Quality (Jan. 27, 2009), *available at* http://www.biologicaldiversity.org/news/press_releases/2009/ocean-acidification-01-27-2009.html; Ocean Acidification and Marine pH Water Quality Criteria, 74 Fed. Reg. 17484 (Apr. 15, 2009).
[11] *See* Press Release, Center for Biological Diversity, Lawsuit Filed Against Environmental Protection Agency for
Failure to Combat Ocean Acidification (May 14, 2009), *available at* http://www.biologicaldiversity.org/news/press_releases/2009/ocean-acidification-05-14-2009.html.
[12] *See Ctr. for Biological Diversity v. E.P.A*, No: 2:09cv00670 (W.D. Wash. filed May 14, 2009); *see generall*y Andy Hosaido, *Environmental Litigation Standing After* Massachusetts v. EPA: Center for Biological Diversity v. EPA, Sustainable Dev. L. Pol'y, Fall 2009, at 30 (discussing the potential impact of Clean Water Act based litigation to combat the effects of climate change).
[13] *See* Press Release, Center for Biological Diversity, EPA Solicits Input on Ocean Acidification and Carbon Dioxide Limits Under Water Pollution Law (Mar. 22, 2010), *available at* http://www.biologicaldiversity.org/news/press_releases/2010/ocean-acidification-03-22-2010.html; Call for Public Comment, *supra* note 2.
[14] 33 U.S.C. § 1314(a)(2)(B) (2009).
[15] *See* Call for Public Comment, *supra* note 3.
[16] *See* U.S. Commission on Ocean Policy, An Ocean Blueprint for the 21st Century (2004).
[17] *See id.*
[18] *See* Call for Public Comment, *supra* note 3.
[19] *See* Robin Kundis Craig, *The Clean Water Act on the Cutting Edge: Climate Change and Water Quality Regulation*, 24 Natural Res. & Env't, 14, 17 (2009) (explaining that most NPDES permits rely on technology-based effluent limitations, which may not be sufficient for water quality damaged by ocean acidification).
[20] *See id.* at 18.
[21] *See id.* (discussing the ability of the CWA to regulate airborne emissions as it has for airborne mercury deposits, but recognizing it would be financially and logistically difficult and that the Clean Air Act would be a more effective tool for airborne carbon dioxide emissions).
[22] See Petition, *supra* note 2 at 6 (noting that fifty percent of anthropogenic carbon dioxide emissions since the industrial revolution have already been absorbed by the oceans).

Endnotes: The Relationship Between the Access and Benefit Sharing International Regimen and Other International Instruments the World Trade Organization and the International Union for the Protection of New Varieties of Plants *continued from page 33*

VI/24, *available at* http://www.cbd.int/decision/cop/?id=7198. *See also* Bonn Guidelines, http://www.cbd.int/abs/bonn.shtml (last visited May 4, 2010).

[7] A significant amount of literature is now being written about the IR. I particularly recommend Kathryn Garforth & Jorge Cabrera Medaglia, *Sustainable Biodiversity Law: Global Access, Local Benefits*, ICFAI J. Int'l L., Oct. 2005, Vol. IV, No. 4; Miriam Dross & Franziska Wolff, BfN-Skripten, New Elements of the International Regime on Access to Genetic Resources and Benefit sharing- the role of certificates of origin (2005); Miriam Dross & Franziska Wolff, *Do we need a new access and benefit-sharing instrument?*, Y.B. of Int'l Env't L., 2004, Vol. 15; Jorge Cabrera Medaglia, *Las negociaciones sobre el Régimen Internacional de acceso a recursos genéticos y distribución de beneficios: opciones para un país en desarrollo*, Puentes, May-June 2004, Vol V, No. 3; Tim Hodges & Anne Daniel, *Promises and Pitfalls: a First Step on the Road to the ABS International Regime*, RECIEL, 2005, Vol. 14, No. 2; Tomme Young, Opciones y Procesos de desarrollo de un Régimen Internacional sobre Acceso y Distribución de Beneficios: Manual de Resumen para las delegaciones de la CBD (on file with author); Bill Bowen, The ABS Project, IUCN, Developing an Effective International Regime for Access and Benefit Sharing for Genetic Resources: Using Market-Based Instruments (2004).

[8] G.A. Res. 57/260, U.N. Doc. A/RES/57/260 (Dec. 20, 2002). Although the language of the Summit refers only to benefit-sharing, the meeting on the Convention's Program of Work (Montreal, Mar. 2003) recommended that the Working Group on ABS consider, at its second meeting, the process, nature, scope, elements, and modalities for an international regime on access to genetic resources and benefit-sharing.

[9] World Summit on Sustainable Development, Johannesburg, S. Afr., Aug. 26-Sep. 4, *Plan of Implementation of the World Summit on Sustainable Development,*¶ 42, U.N. Doc. A/CONF.199/20.

[10] Seventh Ordinary Meeting of the Conference of the Parties to the Convention on Biological Diversity, Kuala Lumpur, Malay., Feb. 9-20, 2004, *Access and benefit-sharing as related to genetic resources*, ¶ D, U.N. Doc. UNEP/CBD/COP/DEC/VII/19 (Feb. 20, 2004).

[11] *Id.*

[12] *Id.*

[13] Eighth Ordinary Meeting of the Conference of the Parties to the Convention on Biological Diversity, Curitiba, Braz., Mar. 20-31, 2006, *Access and benefit-sharing,* U.N. Doc. UNEP/CBD/COP/DEC/VIII/4 (Jun. 15, 2006). *See* www.cbd.int for information about the IR negotiating process.

[14] *See* Fifth Meeting of the Ad Hoc Open-ended Working Group on Access and Benefit-sharing, http://www.cbd.int/wgabs5/ (last visited May 4, 2010).

[15] *See* Sixth Meeting of the Ad Hoc Open-ended Working Group on Access and Benefit-sharing, http://www.cbd.int/wgabs6/ (last visited May 4, 2010).

[16] Ninth Meeting of the Conference of the Parties to the Convention on Biological Diversity, Bonn, Ger., May 19-30, 2008, Access and benefit-sharing, U.N. Doc. UNEP/CDB/COP/DEC/IX/12 (Oct. 9, 2008).

[17] Eighth Meeting of The Ad Hoc Open-Ended Working Group on Access and Benefit-Sharing, Montreal, Canada, Nov. 9-15, 2009, Annex 1, U.N. Doc. UNEP/CBD/WG-ABS/8/8 (Nov. 20, 2009).

[18] The so-called "Montreal text" was considered unusable due to both its length and the number of bracketed areas of texts, 3400 pairs of them.

[19] See Earth Negotiations Bulletin, Ninth Meeting of the Ad-Hoc Open-ended Working Group on Access to Genetic Resources and Benefit Sharing of the Convention on Biological Diversity, http://www.iisd.ca/biodiv/abs9/ (last visited May 4, 2010).

[20] *See* Ad Hoc Open-Ended Working Group On Access And Benefit-Sharing, *Report of the Ninth Meeting of the ABS/WG*, Annex I, UN Doc. UNEP/CBD/WG-ABS/9/3 (Apr. 26, 2010), *available at* http://www.cbd.int/doc/meetings/abs/abswg-09/official/abswg-09-03-en.pdf [*hereinafter Report of the Ninth Meeting of the ABS/WG*].

[21] *See* Secretariat of the Convention on Biological Diversity, *Access and Benefit-Sharing: Communication of a Proposed Protocol Pursuant to Article 28, Paragraph 3 of the Convention on Biological Diversity*, SCBD/SEL/LG/71198 (Apr. 15, 2010), *available at* http://www.cbd.int/doc/notifications/2010/ntf-2010-071-abs-en.pdf.

[22] Article 28 (Adoption of Protocols) provides that any if this instruments shall be adopted at a meeting of the Conference of the Parties and that "The text of any proposed Protocol shall be communicated to the Contracting Parties by the Secretariat at least six months before such meeting." *See* Convention on Biological Diversity art. 28, June 5, 1992, 1760 U.N.T.S. 79.

[23] A note in the Protocol is written with the following statement: "This document, which was not negotiated, reflects the efforts by the Co-Chairs to elaborate the elements of a draft Protocol, and is without prejudice to the rights of the Parties to make further amendments and additions to the text. This document should be read in conjunction with the main body of the report, which reflects the views of the Parties during the ninth meeting of the Working Group on Access and Benefit-sharing, which took place in Cali, Colombia." See *Report of the Ninth Meeting of the ABS/WG*, *supra* note 20, at 44.

[24] One of the most contentious issues of the negotiations in Cali, was the relationship between the Protocol and other international instruments. These discussions and disagreements are not reflected in the current text. *See Id.* For many delegations it is important that the ABS Protocol includes a self-standing article on its relationship with other international agreements and processes.

[25] Discussions in the World Intellectual Property Organization are also particularly relevant for genetic resources and Traditional Knowledge, but outside the scope of this article. The WIPO Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore ("IGC") was established by the WIPO General Assembly in October 2000 as a forum for debate and dialogue on the relationship between intellectual property, traditional knowledge, genetic resources, and traditional cultural expressions. It was considered that these topics did not fall within the scope of other WIPO bodies. The IGC's mandate consists of analyzing aspects of intellectual property related to genetic resources, traditional knowledge, and the protection of expressions of folklore. One of the topics the Committee had considered—and continues to do so under its current mandate—is precisely the relationship between intellectual property and genetic resources (including disclosure of origin in patent applications) and the protection of TK. The Committee has met on several occasions (15). The current mandate of the Committee (2009-2011) includes:

> (a) The Committee will, during the next budgetary biennium (2010/2011), and without prejudice to the work pursued in other fora, continue its work and undertake text-based negotiations with the objective of reaching agreement on a text of an international legal instrument (or instruments) which will ensure the effective protection of GRs, TK and TCEs.
> (b) The Committee will follow, as set out in the Annex, a clearly defined work program for the 2010/2011 biennium. This work program will make provision for, in addition to the 15th session of the Committee scheduled for December 2009, four sessions of the IGC and three inter-sessional working groups, in the 2010-2011 biennium.
> (c) The focus of the Committee's work in the 2010/2011 biennium will build on the existing work carried out by the Committee and use all WIPO working documents, including WIPO/GRTKF/IC/9/4, WIPO/GRTKF/IC/9/5 and WIPO/GRTKF/IC/11/8A (Traditional Cultural Expressions, Traditional Knowledge and Genetic Resources), which are to constitute the basis of the Committee's work on text-based negotiations.
> (d) The Committee is requested to submit to the 2011 General Assembly the text (or texts) of an international legal instrument (or instruments) which will ensure the effective protection of GRs, TK and TCEs. The General Assembly in 2011 will decide on convening a Diplomatic Conference. World Intell. Prop. Org. [WIPO], *Matters Concerning the Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore,* 1-2, Agenda Item 28, WIPO G.A. 38th Sess. (Sept. 22- Oct. 1, 2009), *available at* http://www.wipo.int/edocs/mdocs/tk/en/wipo_grtkf_ic_15/wipo_grtkf_ic_15_ref_decision_28.pdf.

This was the Committee's strongest mandate yet. The scope of work of the IGC includes the possible development of an international instrument or instruments on IPRs and genetic resources as well as traditional knowledge.

[26] *See* Third Ordinary Meeting of the Conference of the Parties to the Convention on Biological Diversity, Buenos Aires, Argentina, Nov. 4-15, 1996, *Access to Genetic Resources,* ¶ 8, U.N. Doc. UNEP/CBD/COP/DEC/III/15; Fifth Ordinary Meeting of the Conference of the Parties to the Convention on Biological Diversity, Nairobi, Kenya, May 15-26, 2000, *Access to Genetic Resources*, ¶¶ 1-4, U.N. Doc. UNEP/CBD/COP/DEC/V/26 B (May 26, 2000); Sixth Ordinary Meeting of the Conference of the Parties to the Convention on Biological Diversity, the Hague, Neth., Apr. 7-19, 2002, *Access And Benefit-Sharing As Related To Genetic Resources* ¶ 10, U.N. Doc. UNEP/CBD/COP/DEC/VI/24(D); *Id.* UNEP/CBD/COP/DEC/VI/24/24(C)(1); Eighth Ordinary Meeting of the Conference of the Parties to the Convention on Biological

Diversity, Curitiba, Braz., Mar. 20-31, 2006, *Access and Benefit-Sharing,* U.N. Doc. UNEP/CBD/COP/DEC/VIII/4(D).

[27] Kent Nnadozie et al., Synergetic Implementation: Coordinated National Implementation Of Access And Benefit Sharing Issues – CBD, Biosafety Protocol, ITPGRA and Relevant IPR Instruments (unpublished manuscript, on the file with the author).

[28] *See* Convention on Biological Diversity Conference of Parties, *Access to Genetic Resources,* ¶ 8, U.N. Doc. UNEP/CBD/COP/DEC/III/15.

[29] *See e.g.*, Council for Trade-Related Aspects of Intellectual Property Rights, *Summary Of Issues Raised And Points Made With Regard The Relationship Between The Trips Agreement And The CBD*, IP/C/W/368/rev 1 (Feb. 8, 2006), *available at* http://www.wto.org/english/tratop_e/TRIPs_e/ipcw368_e.pdf.

[30] *See* World Trade Organization, Ministerial Declaration of 20 November 2001, ¶ 32(i), WT/MIN(01)/DEC/1 [hereinafter Doha Declaration].

[31] Nnadozie et al., *supra* note 27.

[32] Ninth Ordinary Meeting of the Conference of the Parties to the Convention on Biological Diversity, Bonn, Ger., May 19-30, 2008, *The Role of Intellectual Property Rights and Technology Transfer in the Context of the Convention on Biological Diversity*, U.N. Doc. UNEP/CBD/COP/9/INF/7 (May 3, 2008), *available at* https://www.cbd.int/doc/meetings/cop/cop-09/information/cop-09-inf-07-en.pdf.

[33] Seventh Ordinary Meeting of the Conference of the Parties to the Convention on Biological Diversity, Kuala Lumpur, Malay., Feb. 9-20, 2004, *Transfer of Technology and Technology Cooperation* Annex, U.N. Doc. UNEP/CBD/COP/DEC/VII/29 (Apr. 13, 2004).

[34] Doha Declaration, *supra* note 30, ¶ 19.

[35] There are several issues that were discussed by the delegations at the TRIPS Council, which are relevant to the CBD, such as the "patentability of life," removal of references to patenting of microorganisms from article 27, inclusion of the Traditional Knowledge protection on the concept of sui generis systems found in article 27.3(b), the scope and extension of the exemptions of article 27.3 (b), among others. *See* Eighth Ordinary Meeting of the Conference of the Parties to the Convention on Biological Diversity, Curitiba, Braz., Mar. 20-31, 2006, *The Relationship between the TRIPS Agreement and the Convention on Biological Diversity–Summary of Issues Raised and Points Made–Submission by the WTO Secretariat,* U.N. Doc. UNEP/CBD/COP/8/Inf/37.

[36] For a detailed analysis of the different legal ways in which some countries have included disclosure of origin in patent applications at the national level, *see* Thomas Henninger, *Disclosure requirements in patent law and related measures. An overview of existing national and regional legislation on IP and biodiversity*, ICTSD, Mar., 2010.

[37] Doha Declaration, *supra* note 30, ¶ 34.

[38] *Id.* ¶ 12.

[39] Communication from Brazil, China, Colombia, Cuba, India, Pakistan, Peru, Thailand, and Tanzania, *Doha Work Programme – The Outstanding Implementation Issue on the Relationship Between the TRIPS Agreement and the Convention on Biological Diversity,* WT/GC/W/564 (May, 31 2006), *available at* http://www.wto.org/english/tratop_e/trips_e/art27_3b_e.htm. Norway has also submitted an alternative proposal for disclosure of origin. Communication from Norway, *The Relationship Between the TRIPS Agreement, the Convention on Biological Diversity and the Protection of Traditional Knowledge,* IP/C/W/473 (June 14, 2006).

[40] The language of the proposal is broader and makes reference to "biological resources."

[41] For further details *see* documents WT/GC/W/564/Rev.2, TN/C/W/41/Rev.2, IP/C/W/474 and WT/GC/W/564/Rev.2/Add.2, TN/C/W/41/Rev.2/Add.2, IP/C/W/474/Add.2.

[42] *See* WT/GC/W/591TN/C/W/50 (June, 9 2008) ("Issues related to the extension of the protection of geographical indications provided for in article 23 of the TRIPS Agreement to products other than wines and spirits and those related to the relationship between the TRIPS Agreement and the Convention on Biological Diversity," which summarized the different positions on this issue before the Mini-Ministerial.).

[43] The three current intellectual property issues: the relationship between the TRIPS Agreement and the CBD; the extension of the protection of geographical indications provided for under Article 23 to products other than wines and spirits; and the establishment of a multilateral system of notification and registration of geographical indications for wines and spirits.

[44] Communication from Albania, Brazil, China, Colombia, Ecuador, the European Communities, Iceland, India, Indonesia, the Kyrgyz Republic, Liechtenstein, the Former Yugoslav Republic of Macedonia, Pakistan, Peru, Sri Lanka, Switzerland, Thailand, Turkey, the ACP Group, and the African Group, *Draft Modalities for TRIPS Related Issues,* TN/C/W/52 (July 19, 2008). Draft Modality text as contained in document TN/C/W/52 have been cosponsored by 110 Members that request the inclusion of the TRIPS related issues as part of the horizontal process for the negotiations. The Draft speaks of country providing/source of genetic resources not of origin. This proposal of Draft Modalities attempts to link the amendments to the TRIPs agreement on three issues, creation of a registry for geographical indications, establishment a disclosure of origin obligation and the extension of the geographical indications protection. The proposal suggests the inclusion of these issues as part of the horizontal process in order to elaborate a final draft legal texts with respect to each of the issues as part of the single undertaking of the Doha Round.

[45] The minutes of the meetings of the TRIPs Council can be found on the WTO website.

[46] *See generally* Jorge Cabrera Medaglia, *Trade (in particular free trade agreements) and access to genetic resources and benefit sharing: exploring some the linkages*, Asian Biotechnology and Dev. R., July 2008, Vol. 10, No. 3.

[47] Ninth Ordinary Meeting of the Conference of the Parties to the Convention on Biological Diversity, Bonn, Ger., May 19-30, 2008, *Access and Benefit Sharing* Annex, U.N. Doc. UNEP/CBD/COP/IX/12.1 (Oct. 9, 2008). The Annex in accordance to Decision IX/12.1 shall be the basis for the negotiations. The Components have been divided in two different categories: "Components to be further elaborated with the aim of incorporating them in the IR" and "Components for Further Consideration." The distinction was later on abandoned at the Seventh Meeting of the ABS-WG.

[48] Eighth Ordinary Meeting of the Conference of the Parties to the Convention on Biological Diversity, Curitiba, Braz., Mar. 20-31, 2006, *Access and Benefit-Sharing,* U.N. Doc. UNEP/CBD/COP/DEC/VIII/4(D).

[49] This issue has not been agreed yet, important disagreements about this language remain. *See* Ninth meeting of the Conference of the Parties to the Convention on Biological Diversity, Bonn, Ger., May 19-30, 2008, *Access and benefit-sharing,* U.N. Doc. UNEP/CDB/COP/DEC/IX/12 (Oct. 9, 2008).

[50] *Id.* at 49.

[51] It is not the intention of this article to develop the idea of the certificate in depth. For further detail, see the following documents; Miriam Dross & Franziska Wolff, *New Elements of the International Regime on Access and Benefit Sharing of Genetic Resources: the Role of Certificates of Origin,* BFN, 2005; Jose Carlos Fernandez, The Feasibility, Practicality and Cost of a Certificate of Origin System for Genetic Resources: Economic Considerations, in Yokohama Round Table: Toward Fair and Equitable Benefit Sharing: Instruments for the Effective Implementation of the Bonn Guidelines under the Convention On Biological Diversity; Yokohama, Japan, Mar. 11, 2005; Brendan Tobin, David Cunningham, and Kazuo Watanabe, *The Feasibility, Practicality and Cost of a Certificate of Origin System for Genetic Resources*, United Nations University Institute of Advanced Studies Yokohama, Japan, Dec. 2004, *available at* http://www.ias.unu.edu/binaries2/abswg-03-inf-05-en_revised%202.pdf.

[52] An analysis of the causes behind processes to reform the implementation of ABS laws can be found in, Kathryn Garforth and Jorge Cabrera Medaglia, Legal Reform for the Development and Implementation of Measures on Access to Genetic Resources and Benefit-Sharing (T.W. McInerney, ed., International Development Law Organization 2006).

[53] Jose Carlos Fernandez, The Feasibility, Practicality and Cost of a Certificate of Origin System for Genetic Resources: Economic Considerations, in Yokohama Round Table: Toward Fair and Equitable Benefit Sharing: Instruments for the Effective Implementation of the Bonn Guidelines under the Convention On Biological Diversity; Yokohama, Japan, Mar. 11, 2005.

[54] On this last aspect, *see* Sélim Louafi & Jean-Frédéric Morin, *Certificates of Origin for Genetic Resources and International Trade Law* (IDRRI 2004).

[55] Ninth meeting of the Conference of the Parties to the Convention on Biological Diversity, Bonn, Ger., May 19-30, 2008, *Access and benefit-sharing,* U.N. Doc. UNEP/CDB/COP/DEC/IX/12 (Oct. 9, 2008).

[56] Ninth Meeting of the Ad Hoc Open Ended Working Group On Access and Benefit-Sharing, *Revised Draft Protocol on access to Genetic Resources and the Fair and Equitable Sharing of Benfits Arising from their Utilization to the Convention on Biological Diversity* art. 13(1)-(5), U.N. Doc. UNEP/CBD/WG-ABS/9/3 Annex I, *available at* https://www.cbd.int/doc/meetings/abs/abswg-09/official/abswg-09-03-en.pdf.

[57] Eighth Ordinary Meeting of the Conference of the Parties to the Convention on Biological Diversity, Curitiba, Braz., Mar. 20-31, 2006, *Access and Benefit-Sharing,* U.N. Doc. UNEP/CBD/COP/DEC/VIII/4(C).

[58] Fifth Meeting of the Ad Hoc Open Ended Working Group On Access and Benefit-Sharing, *Report of the meeting of the Group of Technical Experts on an international recognized certificate of origin/source/legal provenance* U.N.

Doc. UNEP/CBD/WG-ABS/5/7 (Feb. 20, 2007), *available at* http://www.cbd.int/doc/meetings/abs/abswg-05/official/abswg-05-07-en.pdf.

[59] Brendan Tobin, Geoff Burton, & Jose Carlos Fernandez-Ugalde, Certificates of Clarity and Confusion: The Search for a Practical, Feasible and Cost Effective System for Certifying Compliance with PIC and MAT UNU-IAS (2008) *available at* http://www.ias.unu.edu/resource_centre/Certificates%20of%20Clarity%20or%20Confusion_The%20search%20for%20a%20practical_%20feasible%20and%20cost%20effective%20system%20for%20certifying%20compliance%20with%20%20PIC%20and%20MAT.pdf.

[60] *Id.*

[61] *See* Sélim Louafi & Jean-Frédéric Morin, *Certificates of Origin for Genetic Resources and International Trade Law* (IDDRI 2004), (suggesting that in order to ensure consistency with WTO rules, any certification system should be designed on a product basis—not on that of a country or an individual company).

[62] Transfer of Technology has also been identified as a benefit sharing option in the Bonn Guidelines.

[63] Ninth Meeting of the Ad Hoc Open Ended Working Group On Access and Benefit-Sharing, *Revised Draft Protocol on access to Genetic Resources and the Fair and Equitable Sharing of Benfits Arising from their Utilization to the Convention on Biological Diversity* art. 18, U.N. Doc. UNEP/CBD/WG-ABS/9/3 Annex I, *available at* https://www.cbd.int/doc/meetings/abs/abswg-09/official/abswg-09-03-en.pdf.

[64] In this regard Article 1 of the CBD has been pointed out, "It is noteworthy that this fundamental provision of the Convention already includes an explicit reference to technology transfer as a means to implement its third objective." *See* Ninth Ordinary Meeting of the Conference of the Parties to the Convention on Biological Diversity, Bonn, Ger., May 19-30, 2008, *The Role of Intellectual Property Rights and Technology Transfer in the Context of the Convention on Biological Diversity*, U.N. Doc. UNEP/CBD/COP/9/INF/7 (May 3, 2008), *available at* https://www.cbd.int/doc/meetings/cop/cop-09/information/cop-09-inf-07-en.pdf. Decision VII/19 makes an explicit reference to the elaboration and negotiation of the IR to effectively implement the provisions in article 15, 8 (J) and three objectives of the CBD. Seventh Ordinary Meeting of the Conference of the Parties to the Convention on Biological Diversity, Kuala Lumpur, Malay., Feb. 9-20, 2004, *Access and benefit-sharing as related to genetic resources*, ¶ D, U.N. Doc. UNEP/CBD/COP/DEC/VII/19 (Feb. 20, 2004).

[65] Ninth Ordinary Meeting of the Conference of the Parties to the Convention on Biological Diversity, Bonn, Ger., May 19-30, 2008, *The Role of Intellectual Property Rights and Technology Transfer in the Context of the Convention on Biological Diversity*, U.N. Doc. UNEP/CBD/COP/9/INF/7 (May 3, 2008), *available at* https://www.cbd.int/doc/meetings/cop/cop-09/information/cop-09-inf-07-en.pdf.

[66] Part 2 of CBD article 16 provides that technology subject to patents or other IPRs access and transfer must be provided "on terms which recognize and are consistent with the adequate and effective protection of IPR." The inclusion of the phrase "adequate and effective" makes a direct link to the TRIPs. *See* Susan Bragdon et al., *Safeguarding Biodiversity: The Convention on Biological Diversity (CBD),* in The Future Control of Food (Geoff Tansey& Tasmin Rajotte eds., 2008).

[67] A general description of the International Union for the Protection of New Varieties of Plants was provided in document UNEP/CBD/WG-ABS/3/2, which highlights its relationship to access and benefit-sharing. Third Meeting of the Ad Hoc Open Ended Working Group On Access and Benefit-Sharing, *Analysis of Existing National, Regional, and International Legal Instruments Relating to Access and Benefit Sharing and Experience Gained in their Implementation, Including Identification of Gaps*, U.N. Doc. UNEP/CBD/WG-ABS/3/2 (Nov. 10, 2004).

[68] *Id.*

[69] International Union for the Protection of New Varieties of Plants, What it is, What it does, UPOV Publication No. 437 (E)(2003), *available at* http://upov.int/export/sites/upov/en/about/pdf/pub437.pdf [hereinafter UPOV].

[70] Int'l Convention for the Protection of New Varieties of Plants, art. 15 (Mar. 19, 1991), http://upov.int/export/sites/upov/en/publications/conventions/1991/pdf/act1991.pdf (last visited May 5, 2010).

[71] UPOV, *supra* note 69.

[72] Third Meeting of the Ad Hoc Open Ended Working Group On Access and Benefit-Sharing, *Compilation of submissions provided by parties, governments, indigenous and local communties and relevant stakeholders in preparation for the third meeting of the ad hoc open-ended working group on access and benefit-sharing,* U.N. Doc. UNEP/CBD/WG-ABS/3/INF/1.

[73] International Union for the Protection of New Varieties of Plants, *Reply of UPOV to the Notification of June 26, 2003, from the Executive Secretary of the Convention on Biological Diversity (CBD)*, http://www.upov.int/export/sites/upov/en/news/2003/pdf/cbd_response_oct232003.pdf

[74] Third Meeting of the Ad Hoc Open Ended Working Group On Access and Benefit-Sharing, *Compilation of Submissions Provided by Parties, Governments, International Organizations, Indigenous and Local Communities and Relevant Stakeholders Related to the International Regime on Access and Benefit-Sharing*, U.N. Doc. UNEP/CBD/WG-ABS/4/INF/3 (Dec. 14, 2005), *available at* http://www.cbd.int/doc/meetings/abs/abswg-04/information/abswg-04-inf-03-en.pdf.

[75] Fifth Meeting of the Ad Hoc Open Ended Working Group On Access and Benefit-Sharing, *Overview of recent developments at the international level relating to access and benefit-sharing, Convention on Biological Diversity*, U.N. Doc. UNEP/CBD/WG-ABS/5/4/Add.1

[76] UPOV, Report on the Impact of Plant Variety Protection (2005), *available at* http://www.upov.int/en/publications/impact.html.

[77] *Id.* at 3, 5.

[78] Int'l Union for the Protection of New Varities of Plants, *Access to Genetic Resources and Benefit Sharing*; ¶ 6, *available at* http://www.upov.int/en/news/2003/pdf/cbd_response_oct232003.pdf.

[79] *Id.* at ¶¶ 7-9.

[80] *Id.* at ¶ 10.

[81] *Id.* at ¶ 12.

[82] *Id.* at ¶ 11.

[83] Letter from Kamil Idris, Secretary-General, UPOV, to Ahmed Djoghlaf, Executive Secretary, CBD (Apr. 17, 2008), *available at* http://www.upov.int/export/sites/upov/en/about/pdf/upov_cbd_17_04_2008.pdf.

[84] In the case of plant varieties, there may be technical and practical obstacles to this provision unless it is carefully structured. Some difficulties have been pointed out regarding the applicability of a disclosure requirement to plant varieties, such as: problems that occur when plant varieties originate from genetic material which came from different countries and sources and from crosses and back-crosses and obstacles to determining the origin of the germplasm of a variety because of the lack of documentation and the length of time between its acquisition and its use in breeding programmes. *See* Graham Dutfield, Protecting Traditional Knowledge and Folklore: A review of progress in diplomacy and policy formulation (2003) (Issue Paper No. 1, ICTSD and UNCTAD) *available at* http://ictsd.org/downloads/2008/06/cs_dutfield.pdf.

[85] *See* Int'l Convention for the Protection of New Varieties of Plants, art. 15(1)(iii) (Mar. 19, 1991), http://upov.int/export/sites/upov/en/publications/conventions/1991/pdf/act1991.pdf; Int'l Convention for the Protection of New Varieties of Plants, art. 5(3) (Oct. 23, 1978), http://www.upov.int/en/publications/conventions/1978/act1978.

[86] Ninth Meeting of the Conference of the Parties to the Convention on Biological Diversity, Bonn, Ger., May 19-30, 2008, *Access and benefit-sharing* Annex I, III, U.N. Doc. UNEP/CDB/COP/DEC/IX/12 (Oct. 9, 2008).

[87] COP Decision VII/19 reaffirms the fact that disclosure of origin in IPR applications is part of the terms of reference of the Annex to Decision VII/19 D for the development of the IR. It recognizes that this issue has been discussed in the WIPO and the WTO, and invites the relevant fora to begin (or continue) discussing the topic of disclosure of origin in IPR applications, bearing in mind the need to ensure that their work is supportive of and does run counter to CBD objectives. Seventh Ordinary Meeting of the Conference of the Parties to the Convention on Biological Diversity, Kuala Lumpur, Malay., Feb. 9-20, 2004, *Access and benefit-sharing as related to genetic resources*, U.N. Doc. UNEP/CBD/COP/DEC/VII/19 (Feb. 20, 2004). *See also* Ninth Meeting of the Ad Hoc Open Ended Working Group On Access and Benefit-Sharing, *Revised Draft Protocol on access to Genetic Resources and the Fair and Equitable Sharing of Benfits Arising from their Utilization to the Convention on Biological Diversity* art. 18, U.N. Doc. UNEP/CBD/WG-ABS/9/3 Annex I, *available at* https://www.cbd.int/doc/meetings/abs/abswg-09/official/abswg-09-03-en.pdf.

[88] *See* Nnadozie et al., *supra* note 27; Joshua Sarnoff & Carlos Correa, *Analysis of Options for Implementing Disclosure of Origin Requirements in Intellectual Property Applications – A contribution to UNCTAD's response to the invitation of the Seventh Conference of the Parties of the Convention on Biological Diversity*, UN Doc. UNCTAD/DITC/TED/2004/14 (2006); IUCN et al., Disclosure Requirements: Ensuring Mutual Supportiveness Between the WTO TRIPs Agreement and the CBD (2005), *available at* http://www.iprsonline.org/resources/docs/Disclosure_req_book.pdf; Tobin et al., *supra* note 59; Jorge Cabrera Medaglia, IUCN, The International Regimen for Access and Benefit Sharing (2006).

[89] Interpretation of the TRIPS agreement is undertaken under the procedures of the WTO (Article IX.2 of the WTO Agreement). For the intellectual property

point of view existing standard on patentability scope and use of patents, such as those set out in articles 27, 29, 32, and 62 of the TRIPS agreement may afford some guidance to how WIPO and WTO Member States may address this concept. *See* World Inetll. Prop. Org. [WIPO], *Technical Study on Patent Disclosure Requirements Related to Genetic Resources and Traditional Knowledge*, WIPO Publication No.786(E) (2003), *available at* http://www.wipo.int/tk/en/publications/technical_study.pdf.

[90] The current drafting of the disclosure requirements in article 13 of the Draft Protocol, could respond to this approach. The text does not address what could happen in the case of non compliance with the disclosure requirements, e.g. if the patent could be revoked or otherwise limited in is effect if obtained in a breach of a disclosure obligation. The lack of clarity on the legal consequences of the lack of disclosure or insufficient or false disclosure is one of the critics of the current provisions. See Earth Negotiations Bulletin, *op cit.*.

[91] Decision IX/12 created an Expert Group on concepts, terms, working definitions and sectoral approaches.

[92] "Locating such provisions within the CBD regime would not incorporate disclosure requirements directly into the intellectual property law system, and thus would complicate efforts to assure that disclosure obligations are adopted within the intellectual property treaty regimes. Further disclosure requirements mandated within the CBD would not directly apply to the intellectual property systems of countries that are not Parties of the CBD." *See* Sarnoff & Correa, *supra* note 88, at 36. This is the case for the United States, which is a signatory but has not yet ratified the CBD.

[93] *See* Report of the Technical Expert Group, op cit, par. 4 (regarding the objectives of the certificates).

[94] World Intell. Prop. Org. [WIPO], *Intellectual Property and Traditional Knowledge*, Booklet No. 2, WIPO Publication No. 920(E), (2009).

[95] CBD, *supra* note 1, art. 18.

[96] CBD, *supra* note 1, art. 15, 16, 19.

[97] *See* Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, Art. 7, 8, 66.2, 1869 U.N.T.S. 299 (1994), *available at* http://www.wto.org/english/tratop_e/trips_e/t_agm2_e.htm (declaring objectives: "the protection and enforcement of IPR should contribute to the promotion of technological innovation and to the transfer and dissemination of technology. . . ."); *id.* art. 8 (stating principles: "Members may, in formulating or amending other laws and regulations, adopt measures necessary to . . . promote the public interest in sector of vital importance to their socio-economic and technological development, provided that such measures are consistent with the provisions of this Agreement); *id.* art. 66.2 (addressing Least Developed Country Members: "Developed Countries shall provide incentives to enterprises and institutions in their territories for the purpose of promoting and encouraging technology transfer to least developed country Members. . . . "). The TRIPs Council adopted a Decision on February 2003 which lays down an obligation to developed countries to submit reports on actions taken or envisaged to provide such incentives.

[98] Doha Declaration, *supra* note 30, para. 19.

[99] Sarnoff & Correa, *supra* note 88, at 23 ("Although UPOV has suggested that disclosure obligations that would deny or invalidate plant rights conflict with the UPOV Convention, UPOV did not directly address the issue of entitlement to apply for such rights, but rather treated such requirements as an additional condition for protection").

[100] Sarnoff & Correa, *supra* note 88, at 35 ("Applying such disclosure requirements only in the context of patents, however, would not affect other intellectual property applications whose subject matter implicates CBD access and benefit sharing requirements. Of particular relevance such a limitation would not apply mandatory disclosure obligations to the subject matter of plant breeders rights").

[101] The current text of the Protocol (Article 13) refers broadly to disclosure requirements and check points, including IPR Offices. It may also include PBR offices. However, the formulation of the obligation is unclear in terms of legal sanctions, to what extent is a condition for protection or not, etc.

[102] The same argument applies to the certificate as an instrument to facilitate the disclosure requirements.

[103] *See* The Role of Intellectual Property . . . *op cit*, paragraph 48, note 14.

[104] *See* Nnadozie et al., *supra* note 27.

[105] Center for International Sustainable Development Law Biodiversity and Biosafety Law Programme, *The Interface Between Sustainable Forest Management and Access and Benefit Sharing: Outlining Potential Areas of Synergy,* Jorge Cabrera, Oliver Rukundo, & Frederic Perron-Welch, Montreal, Can., 2010.

Endnotes: Using REDD to Promote Biodiversity-Sensitive Forest Fire Management Schemes *continued from page 34*

[1] U.N. FAO, Fire Management: Voluntary Guidelines 11 (FAO 2006), *available at* www.fao.org/forestry/site/35853/en [hereinafter Voluntary Guidelines].

[2] Secretariat of the Convention on Biological Diversity, Impact of Human-Caused Fires on Biodiversity and Ecosystem Functioning, and Their Causes in Tropical, Temperate and Boreal Forest Biomes 14 (2001), *available at* http://www.cbd.int/doc/publications/cbd-ts-05.pdf [hereinafter Impact of Human-Caused Fires on Biodiversity].

[3] Voluntary Guidelines, *supra* note 1, at 3.

[4] U.N. FAO, Fire Management Global Assessment 2006 x (FAO 2007), *available at* ftp://ftp.fao.org/docrep/fao/009/A0969E/A0969E00.pdf.

[5] U.N. FAO, *Fire Management: Forests and Fire*, March 6, 2010, http://www.fao.org/forestry/firemanagement/en/ (last visited April 20, 2010) ("Although fire has been the primary agent of forest degradation, as a natural process it serves an important function in maintaining the health of certain ecosystems.").

[6] Elisa Morgera & Maria Teresa Cirelli, U.N. FAO, Forest Fires and the Law: A Guide to National Drafters Based on Fire Management Voluntary Guides 9-10 (2009), *available at* ftp://ftp.fao.org/docrep/fao/011/i0488e/i0488e00.pdf.

[7] Impact of Human-Caused Fires on Biodiversity, *supra* note 2, at 8.

[8] *See id*. at 14.

[9] *See* Robert Nasi et al., *Forest Fire and Biological Diversity*, 53 Unasylva 36, 39 (2002), *available at* ftp://ftp.fao.org/docrep/fao/004/y3582e/y3582e05.pdf.

[10] *See id*.

[11] Impact of Human-Caused Fires on Biodiversity, *supra* note 2, at 17.

[12] *Id.*

[13] Mark A. Cochrane, *Fire Science for Rainforests*, 421 Nature 913, 913 (2003), *available at* http://goes.msu.edu/publications/pdfs_ps/CGCEO%2079.pdf.

[14] *Id*.

[15] Impact of Human-Caused Fires on Biodiversity, *supra* note 2, at 17.

[16] *Id*. at 9.

[17] *See id.* at 17(boreal); *id.* at 15 (temperate); *id.* at 10 (tropical).

[18] *See id.* at 17.

[19] *See id.*

[20] *See* Cochrane, *supra* note 13, at 915, box 2 (explaining that increased logging can give rise to frequent fires by reducing canopy cover, which releases moisture, and increasing presence of dead biomass).

[21] *Id*. at 913.

[22] Impact of Human-Caused Fires on Biodiversity, *supra* note 2, at 11.

[23] UN-REDD Programme Secretariat, UN REDD Year in Review 2 (2009), *available at* http://www.un-redd.org/NewsCentre/2009_Year_In_Review/tabid/3499/language/en-US/Default.aspx.

[24] *See id.* at 4.

[25] *See id.*

[26] *See* Copenhagen Accord art. 6, Dec. 18, 2009, FCCC/CP/2009/11/Add.1, Decision 2/CP.15 (expressing non-binding support for the expansion of REDD plus).

[27] Amazonas Sustainable Foundation, The Juma Sustainable Development Reserve Project: Reducing Greenhouse Gas Emissions from Deforestation in the State of Amazonas, Brazil 114 (2008), *available at* http://www.climate-standards.org/projects/files/juma/PDD_Juma_Reserve_RED_Project_v5_0.pdf.

[28] Alan Grainger et al., *Biodiversity and REDD at Copenhagen*, 19 Current Biology 974, 975 (2009), *available at* http://download.cell.com/current-biology/pdf/PIIS096098220901776X.pdf (advocating the use of biodiversity assessments in REDD national plans to avoid REDD policies that harm biodiversity).

Endnotes: Getting on the List: Politics and Procedural Maneuvering in CITES Appendix I and II Decisions for Commercially Exploited Marine and Timber Species *continued from page 40*

[2] *See Summary of the Fourteenth Conference of the Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora*, Earth Negotiations Bulletin (Int'l Inst. for Sustainable Dev., New York, N.Y.), June 18, 2007, at 21, [hereinafter ENB CITES COP-14], *available at* http://www.iisd.ca/download/pdf/enb2161e.pdf; Convention on International Trade in Endangered Species of Wild Fauna and Flora, pmbl, Mar. 3, 1973, 27 U.S.T. 1087, 993 U.N.T.S. 243 (entered into force July 1, 1975) [hereinafter CITES] (regulating trade in species and their parts).

[3] *See* ENB CITES COP-14, *supra* note 2, at 21; ENB CITES COP-15, *supra* note 1, at 17.

[4] *See* ENB CITES COP-14, *supra* note 2, at 21.

[5] CITES, CoP15 decisions on amendment proposals, *available at* http://www.cites.org/eng/news/meetings/cop15/CoP15-decisions-on-proposals.pdf [hereinafter CoP15 decisions].

[6] Adding a species to Appendix I or II is only the first step to providing protection for a species under CITES. The range of additional actions needed, funding, and enforcement mechanisms are beyond the scope of this article. *See generally* James B. Murphy, Comment, *Alternative Approaches to the CITES "Non-Detriment" Finding for Appendix II Species*, 36 Envtl. L. 531, 533 (2006); ENB CITES COP-15, *supra* note 1 (considering some of the relevant issues); TRAFFIC, Marine species get raw deal at CITES, Mar. 25, 2010, http://www.traffic.org/home/2010/3/25/marine-species-get-raw-deal-at-cites.html (last visited Apr. 15, 2010).

[7] CITES, *supra* note 2, arts. I-VI.

[8] *See* Memorandum of Understanding Between the Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora and IUCN-The World Conservation Union, July 1999, *available at* http://cites.org/common/disc/sec/CITES-IUCN.pdf; CITES, *supra* note 2; CITES, The CITES species, http://www.cites.org/eng/disc/species.shtml (last visited Apr. 22, 2010) [hereinafter The CITES species].

[9] *See* The CITES species, *supra* note 8.

[10] CITES, *supra* note 2, art. II(1). Although, for reasons considered in the section analyzing listing decisions of COP-15, Appendix I does not include *all* species referred to.

[11] *See* CITES, *supra* note 2, art. III.

[12] CITES, *supra* note 2, art. II(2); Fourteenth Meeting of the Conference of the Parties to CITES, The Hague, Neth., June 3-15, 2007, Criteria for Amendment of Appendices I and II, Conf. 9.24 (Rev. CoP14) (amending Res. Conf. 9.24 (1994)), Annex 2b(A), *available at* http://www.cites.org/eng/res/all/09/E09-24R14.pdf [hereinafter CITES Criteria].

[13] *See* CITES, *supra* note 2, art. IV(2)(a), (4).

[14] CITES, *supra* note 2, arts. II(3), V, XVI.

[15] The CITES species, *supra* note 7.

[16] CITES, *supra* note 2, art. IX.

[17] CITES, *supra* note 2, arts. III-V.

[18] CITES, *supra* note 2, arts. VIII, XXIII(2).

[19] *See* CITES, *supra* note 2, arts. XV(3), XXIII(3).

[20] CITES, *supra* note 2, art. XV. *See generally* Annecoos Wiersema, *The New International Law-Makers? Conferences of the Parties to Multilateral Environmental Agreements*, 31 Mich. J. Int'l L. 231 (2009) (discussing the creation of international legal obligations through COPs).

[21] CITES, *supra* note 2, art. XV.

[22] CITES, *supra* note 2, art. XV(1)(a).

[23] CITES, *supra* note 2, art. XV(1)(a), (2)(c).

[24] CITES, *supra* note 2, art. XV(1)(a), (2)(b).

[25] CITES, *supra* note 2, art. XVI(1).

[26] CITES, *supra* note 2, art. XVI(2).

[27] *Id.*, art. XVI(3).

[28] CITES Criteria, *supra* note 12.

[29] *Id. See generally* Annecoos Wiersema, *Adversaries or Partners? Science and the Precautionary Principle in International Wildlife Regimes*, 11:4 J. Int'l Wildlife L. & Pol'y 211 (2008) (discussing the textual changes in the CITES Criteria related to the precautionary principle).

[30] CITES Criteria, *supra* note 12, Annex 1.

[31] *Id.*

[32] CITES Criteria, *supra* note 12, Annex 2a.

[33] CITES Criteria, *supra* note 12, Annex 2b.

[34] CITES Criteria, *supra* note 12, Annex 1, Annex 2b.

[35] CITES Criteria, *supra* note 12, Annex 5.

[36] *Id.*

[37] *Id.*

[38] *See* ENB CITES COP-15, *supra* note 1, at 15-18; ENB CITES COP-14, *supra* note 2, at 22.

[39] CITES, *supra* note 2, art. XV(1)(a), (2)(b).

[40] *See* FAO-CITES Memorandum of Understanding, 2006, *available at* http://www.cites.org/eng/disc/sec/FAO-CITES-e.pdf [hereinafter MoU].

[41] MoU, ¶ 6.

[42] ENB CITES COP-14, *supra* note 2, at 22.

[43] *See* Third FAO Expert Advisory Panel for the Assessment of Proposals to Amend Appendices I and II of CITES Concerning Commercially-Exploited Aquatic Species, Dec. 7-12, 2009, *Report*, FAO Fisheries Report. No. 925, *available at* ftp://ftp.fao.org/FI/DOCUMENT/R925/r925.pdf (providing a full analysis and recommendations of COP-15 aquatic species listing proposals).

[44] ENB CITES COP-15, *supra* note 1, at 18.

[45] *Id.*, at 17.

[46] ENB CITES COP-14, *supra* note 2, at 21.

[47] *See* CoP15 decisions, *supra* note 4 (listing all decisions taken at COP-15 related to amendments to the Appendices).

[48] ENB CITES COP-15, *supra* note 1, at 17-18.

[49] *See, e.g., Trade and Conservation: Fin times*, The Economist (London), Mar. 18, 2010, *available at* http://www.economist.com/science-technology/displaystory.cfm?story_id+15720346; Jolly & Broder, *supra* note 1; Press Release, European Union, EU Confirms Support for Bluefin Tuna Trade Ban (Mar. 11, 2010), http://www.euractiv.com/en/sustainability/eu-confirms-support-bluefin-tuna-trade-ban-news-329139 (last visited Apr. 20, 2010).

[50] Christine Goepp Towberman, *Fishing for a Solution: The Role of the United States in Preventing Collapse of the Eastern Atlantic Bluefin Fishery*, 38 Envt'l L. Rep. News & Analysis 10102, 10102 (2008).

[51] Fifteenth Meeting of the Conference of the Parties to CITES, Doha, Qatar, Mar. 13-25, 2010, *Summary record of the 8th session of Committee I*, 1, CoP15 Com. I Rec. 8, (Mar. 18, 2010) *available at* http://www.cites.org/eng/cop/15/sum/E15-Com-I-Rec08.pdf [hereinafter *Summary – tuna*]; *Bluefin tuna: Eaten away*, *supra* note 1.

[52] Jolly & Broder, *supra* note 1.

[53] ICCAT has only forty-two countries as members in contrast to the 175 of CITES. *Id.*

[54] Fifteenth Meeting of the Conference of the Parties to CITES, Doha, Qatar, Mar. 13-25, 2010
Proposal to include Atlantic Bluefin Tuna (Thunnus thynnus (Linnaeus, 1758)) on Appendix I of CITES in accordance with Article II 1 of the Convention, ¶ 12, CoP15 Prop. 19, *available at* http://www.cites.org/eng/cop/15/prop/E-15-Prop-19.pdf [hereinafter *Atlantic Bluefin Tuna Proposal*].

[55] David Jolly, *Europe Leans Toward Bluefin Trade Ban*, N.Y. Times, Feb. 4, 2010, *available at* http://www.nytimes.com/2010/02/04/world/europe/04tuna.html?fta=y.

[56] ENB CITES COP-15, *supra* note 1, at 15, 18.

[57] *See Summary – tuna*, *supra* note 51, at 3.

[58] *Atlantic Bluefin Tuna Proposal*, *supra* note 54, ¶ 8.

[59] *Summary – tuna*, *supra* note 51, at 4.

[60] *See id.*, at 1-2 (including text of the amended proposal).

[61] *Id.*, at 2-3.

[62] David Jolly, *Japan Plans to Ignore Any Ban on Bluefin Tuna*, N.Y. Times, Feb. 20, 2010, *available at* http://www.nytimes.com/2010/02/20/business/energy-environment/20tuna.html?fta=y; McCurry, *supra* note 1.

[63] *Bluefin tuna: Eaten away*, *supra* note 1; *Summary – tuna*, *supra* note 51, at 4.

[64] Towberman, *supra* note 50, at 10109.

[65] *Id.*

[66] *Summary – tuna*, *supra* note 51, at 4.

[67] *Id.*

[68] *See Summary – tuna*, *supra* note 51, at 4; *Bluefin tuna: Eaten away*, *supra* note 1.

[69] CITES, *Rules of Procedure of the Conference of the Parties* (as amended at the 14th meeting, The Hague, Neth. 2007), R. 18, *available at* http://www.cites.org/eng/cop/E14-Rules.pdf [hereinafter *Rules of Procedure*].

[70] *Summary – tuna*, *supra* note 51, at 4.

[71] *Id.*, at 4-5. Although the votes on the proposals were conducted by secret ballot, it is likely that the seventy-two parties recorded as having voted to close debate also cast the seventy-two votes to reject the amended proposal, as well as the sixty-eight votes to reject the original proposal and a few of the thirty abstentions. Forty-three parties voted to approve the amended proposal and only twenty voted in favor of the original proposal. *See id.*, at 4-8 (laying out the complete votes on the motion to close debate and on the proposals).
[72] *See* McCurry, *supra* note 1.
[73] *See id.* (describing how Japan had been amassing votes months before COP-15 and how Japanese funding for developing countries' fishing industries had been used to send delegates from some developing countries to the COP).
[74] Press Release, CITES, CITES Conference Ends Without New Sharks in its Net (Mar. 25, 2010), http://www.cites.org/eng/news/press_release.shtml (last visited Apr. 23, 2010).
[75] ENB CITES COP-15, *supra* note 1, at 15-16; Fifteenth Meeting of the Conference of the Parties to CITES, Doha, Qatar, Mar. 13-25, 2010, *Summary record of the sixth plenary session*, 2, CoP15 Plen. 6, (Mar. 25, 2010), *available at* http://www.cites.org/eng/cop/15/sum/E15-Plen-06.pdf [hereinafter *Summary – sixth plenary*].
[76] David Jolly, *U.N. Group Rejects Shark Protections*, N.Y. Times, Mar. 23, 2010, *available at* http://www.nytimes.com/2010/03/24/science/earth/24shark.html.
[77] Fifteenth Meeting of the Conference of the Parties to CITES, Doha, Qatar, Mar. 13-25, 2010, *Summary record of the 13th session of Committee I*, 1, CoP15 Com. I Rec. 13 (Rev. 1), (Mar. 23, 2010), *available at* http://www.cites.org/eng/cop/15/sum/E15-Com-I-Rec13.pdf [hereinafter *Summary – hammerhead & oceanic whitetip sharks*].
[78] *Id.*, at 1-3.
[79] Fifteenth Meeting of the Conference of the Parties to CITES, Doha, Qatar, Mar. 13-25, 2010, *Inclusion of Sphyrna lewini (scalloped hammerhead shark) in Appendix II in accordance with Article II paragraph 2(a) of the Convention and satisfying Criterion A in Annex 2a of Resolution Conf. 9.24 (Rev. CoP14)*, 3, CoP15 Prop. 15, *available at* http://www.cites.org/eng/cop/15/prop/E-15-Prop-15.pdf; *Summary – hammerhead & oceanic whitetip sharks*, *supra* note 77, at 2-4. *See also* ENB CITES COP-15, *supra* note 1, at 15.
[80] *See* CITES, *supra* note 2, art. XV(2)(b); CITES Criteria, *supra* note 12, Annex 5.
[81] *Summary – hammerhead & oceanic whitetip sharks*, *supra* note 77, at 3.
[82] *See id.*, at 4.
[83] Fifteenth Meeting of the Conference of the Parties to CITES, Doha, Qatar, Mar. 13-25, 2010, *Inclusion of Carcharhinus longimanus (Poey, 1861) in Appendix II in accordance with Article II paragraph 2(a) of the Convention and satisfying Criterion A in Annex 2a of Resolution Conf. 9.24 (Rev. CoP14)*, 2, CoP15 Prop. 16, *available at* http://www.cites.org/eng/cop/15/prop/E-15-Prop-16.pdf.
[84] ENB CITES COP-15, *supra* note 1, at 16.
[85] *Summary – hammerhead & oceanic whitetip sharks*, *supra* note 77, at 4.
[86] *Id.*
[87] *Id.*, at 5.
[88] *Id.*
[89] Fifteenth Meeting of the Conference of the Parties to CITES, Doha, Qatar, Mar. 13-25, 2010, *Inclusion of Lamna nasus (Bonnaterre, 1788) in Appendix II in accordance with Article II 2(a) and (b)*, 1, CoP15 Prop. 17, *available at* http://www.cites.org/eng/cop/15/prop/E-15-Prop-17.pdf; Fifteenth Meeting of the Conference of the Parties to CITES, Doha, Qatar, Mar. 13-25, 2010, *Summary record of the 14th session of Committee I*, 1, CoP15 Com. I Rec. 14 (Rev. 1), (Mar. 23, 2010), *available at* http://www.cites.org/eng/cop/15/sum/E15-Com-I-Rec14.pdf [hereinafter *Summary – porbeagle & spiny dogfish sharks*].
[90] Juliet Eilperin, *Only One Breed of Shark, the Porbeagle, Earns Protection at CITES Conference*, Washington Post, Mar. 24, 2010, at A02.
[91] *Summary – porbeagle & spiny dogfish sharks*, *supra* note 89, at 1.
[92] ENB CITES COP-15, *supra* note 1, at 16.
[93] *Summary – porbeagle & spiny dogfish sharks*, *supra* note 89, at 2.
[94] *Id.*, at 4.
[95] *Rules of Procedure*, *supra* note 69, at R. 19(1); *Summary – sixth plenary*, *supra* note 75, at 2.
[96] *Id.*
[97] *Summary – sixth plenary*, *supra* note 75, at 2. *See also* ENB CITES COP-15, *supra* note 1, at 16.
[98] Fifteenth Meeting of the Conference of the Parties to CITES, Doha, Qatar, Mar. 13-25, 2010, *Inclusion of Squalus acanthias Linnaeus, 1758 in Appendix II in accordance with Article II 2(a) and (b)*, 2, CoP15 Prop. 18, *available at* http://www.cites.org/eng/cop/15/prop/E-15-Prop-19.pdf [hereinafter *Spiny Dogfish Shark Proposal*].
[99] *Summary – porbeagle & spiny dogfish sharks*, *supra* note 89, at 3.
[100] *Id.*, at 3-4
[101] *Id.*, at 4.
[102] *Spiny Dogfish Shark Proposal*, *supra* note 98, at 2.
[103] *Summary – porbeagle & spiny dogfish sharks*, *supra* note 89, at 4.
[104] *See* Marjorie Mulhall, Note, *Saving the Rainforests of the Sea: An Analysis of International Efforts to Conserve Coral Reefs*, 19 Duke Envtl. L & Pol'y F. 321, 329 (2009).
[105] Fifteenth Meeting of the Conference of the Parties to CITES, Doha, Qatar, Mar. 13-25, 2010, *Inclusion of all species in the family Coralliidae (Corallium spp. and Paracorallium spp.) in Appendix-II of CITES*, 2, CoP15 Prop. 21, *available at* http://www.cites.org/eng/cop/15/prop/E-15-Prop-21.pdf [hereinafter *Coral Proposal*].
[106] *Id.*, at 1.
[107] Mulhall, *supra* note 104, at 345; Fifteenth Meeting of the Conference of the Parties to CITES, Doha, Qatar, Mar. 13-25, 2010, *Summary record of the 10th session of Committee I*, 3, CoP15 Com. I Rec. 10 (Rev. 1), (Mar. 21, 2010), *available at* http://www.cites.org/eng/cop/15/sum/E15-Com-I-Rec10.pdf [hereinafter *Summary – coral*].
[108] ENB CITES COP-14, *supra* note 2, at 19. Although the affirmative vote in the plenary was only one fewer than in the Committee, the votes against nearly doubled, from twenty-eight to fifty-five. *Id.*
[109] Mulhall, *supra* note 104, at 344.
[110] *Summary – coral*, *supra* note 107, at 3.
[111] *Id.*
[112] *Id.*
[113] *Id.*
[114] *See* ENB CITES COP-14, *supra* note 2, at 20; ENB CITES COP-15, *supra* note 1, at 16-17.
[115] *See* ENB CITES COP-14, *supra* note 2, at 21; Fifteenth Meeting of the Conference of the Parties to CITES, Doha, Qatar, Mar. 13-25, 2010, *Summary record of the fifth session of Committee I*, 5, CoP15 Com. I Rec. 5 (Rev. 1), (Mar. 17, 2010), *available at* http://www.cites.org/eng/cop/15/sum/E15-Com-I-Rec05.pdf [hereinafter *Summary – rosewood*].
[116] *See* Fifteenth Meeting of the Conference of the Parties to CITES, Doha, Qatar, Mar. 13-25, 2010, *Inclusion of Aniba rosaeodora Ducke in Appendix II, in compliance with the provisions of Article II, paragraph 2 (a), of the text of the Convention, and paragraph A of Annex 2 a.*, 1-5, CoP15 Prop. 29, *available at* http://www.cites.org/eng/cop/15/prop/E-15-Prop-29.pdf.
[117] *Summary – rosewood*, *supra* note 115, at 4-5.
[118] Fifteenth Meeting of the Conference of the Parties to CITES, Doha, Qatar, Mar. 13-25, 2010, *Inclusion of Bulnesia sarmientoi in Appendix II, in compliance with the provisions of Article II, paragraph 2 (a), of the text of the Convention, and Resolution Conf. 9.24 (Rev. CoP14), Annex 2 a, paragraph A*, 4-7, CoP15 Prop. 42, *available at* http://www.cites.org/eng/cop/15/prop/E-15-Prop-42.pdf.
[119] *Id.* at 5-6.
[120] Fifteenth Meeting of the Conference of the Parties to CITES, Doha, Qatar, Mar. 13-25, 2010, *Summary record of the sixth session of Committee I*, 2, CoP15 Com. I Rec. 6 (Rev. 1), (Mar. 17, 2010), *available at* http://www.cites.org/eng/cop/15/sum/E15-Com-I-Rec06.pdf .
[121] CITES, *supra* note 2, art. XV(1)(b).
[122] *See* Press Release, European Union, *supra* note 48; McCurry, *supra* note 1.
[123] Mulhall, *supra* note 104, at 345.
[124] *Id.*
[125] *See* Towberman, *supra* note 50, at 10109.
[126] *Id.*
[127] Although import restrictions, such as a ban, are generally considered to be in violation of GATT principles, Article XX(g) allows for adoption of nondiscriminatory measures "relating to the conservation of exhaustible resources if such measures are made effective in conjunction with restrictions on domestic production or consumption," under which an import ban could potentially be justified. General Agreement on Tariffs and Trade, Oct. 30, 1947, 61 Stat. A-11, 55 U.N.T.S. 194.
[128] ENB CITES COP-14, *supra* note 2, at 22.

ENDNOTES: THE ROLE OF THE PUBLIC IN THE AMERICAN PIKA'S FUTURE *continued from page 41*

[1] Press Release, U.S. Fish & Wildlife Serv., Endangered Species Act Protection for the American Pika is Not Warranted (Feb. 5, 2010), *available at* http://www.fws.gov/mountain-prairie/species/mammals/americanpika/PressRelease02052010.pdf.

[2] U.S. Fish & Wildlife Serv., Endangered Species: American Pika, *available at* http://www.fws.gov/mountain-prairie/species/mammals/americanpika/.

[3] Ctr. for Biological Diversity, Action Timeline, http://www.biologicaldiversity.org/species/mammals/American_pika/action_timeline.html.

[4] *See id.*

[5] Press Release, U.S. Fish & Wildlife Serv., Fish and Wildlife Service to Conduct Status Review of the America Pika (May 7, 2009), *available at* http://www.fws.gov/mountain-prairie/species/mammals/americanpika/05072009PressRelease.pdf.

[6] Endangered Species Act, 16 U.S.C. §§1531-1544 (1973).

[7] *See* Press Release, U.S. Fish & Wildlife Serv., *supra* note 1.

[8] About My Planet, American Pika Declined ESA Listing Despite Warming Concerns, http://www.aboutmyplanet.com/environment/american-declined/ (last visited Apr. 18, 2010).

[9] United Nations Conference on Environment and Development: Rio Declaration on Environment and Development, 31 I.L.M. 874 (1992).

[10] Aarhus convention, 2161 U.N.T.S. 447; 38 I.L.M. 517 (1999), *available at* http://www.unece.org/env/pp/documents/cep43e.pdf.

[11] *See id.* art. 1.

[12] About.com, The Long Road to Listing: Protecting the Polar Bear Under the Endangered Species Act, http://animals.about.com/od/carnivores/qt/polarbearesa.htm.

[13] *Id.*

[14] *Id.*

[15] *See* Hill v. Norton, 275 F.3d 98, 102 (D.C. Cir. 2001).

[16] *Id.*

[17] *Id.* at 104.

[18] *See* Tenn. Valley Auth. v. Hill, 437 U.S. 153 (1978).

[19] *See id.* at 173.

[20] National Environmental Policy Act, 42 U.S.C. §§ 4321-4347 (1969).

[21] Council Directive 97/11, art. 7, 1997 O.J. (L 073).

ENDNOTES: FINDING THE BALANCE: HARMONIZING RENEWABLE ENERGY WITH WILDLIFE CONSERVATION *continued from page 42*

[1] Press Release, U.S. Dep't of the Interior, Secretary Salazar Issues Order to Spur Renewable Energy Development on U.S. Public Lands (Mar. 11, 2009), http://www.blm.gov/ca/st/en/info/newsroom/2009/march/DOI0911_Salazar_spurs_renewables.print.html.

[2] Press Release, U.S. Dep't of the Interior, Secretary Salazar Announces Approval of Cape Wind Energy Project on Outer Continental Shelf off Massachusetts (Apr. 28, 2010), http://www.doi.gov/news/doinews/Secretary-Salazar-Announces-Approval-of-Cape-Wind-Energy-Project-on-Outer-Continental-Shelf-off-Massachusetts.cfm; *see* Ros Krasny, *Cape Wind, First U.S. Offshore Wind Farm, Approved*, REUTERS, Apr. 28, 2010, http://www.reuters.com/article/idUSTRE63R42X20100428 (announcing that Cape Wind's approval is encouraging for other offshore projects because it has withstood much opposition).

[3] *Cf.* DOI Press Release, *supra* note 1 (announcing a task force "to resolve obstacles to renewable energy permitting, siting, development, and production"). Renewable energy regulation is not an insurmountable obstacle; those same companies that have adapted to complying with fossil fuel regulations are renewable energy research and development investors and are familiar with many applicable regulations. *Cf.* JERRY TAYLOR & PETER VAN DOREN, CATO INST., POL'Y ANALYSIS NO. 422, EVALUATING THE CASE FOR RENEWABLE ENERGY: IS GOVERNMENT SUPPORT WARRANTED? 2 (2002), *available at* http://www.cato.org/pubs/pas/pa422.pdf (highlighting that "corporate conglomerates" such as Exxon and Shell have invested in renewable energy research and development projects since the 1970s).

[4] *See* ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, ANNUAL ENERGY REVIEW 2008 xix (2009) [hereinafter EIA], *available at* http://www.eia.doe.gov/emeu/aer/pdf/aer.pdf (illustrating production, consumption, and imports of various sources of energy). In 2008, the U.S. consumed 884.5 million tonnes of oil ("MTO"), 600.7 MTO-equivalent of natural gas, and 565.0 MTO-equivalent of coal; BRITISH PETROLEUM, BP STATISTICAL REVIEW OF WORLD ENERGY 41 (2009), *available at* http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2008/STAGING/local_assets/2009_downloads/statistical_review_of_world_energy_full_report_2009.pdf (providing energy production and consumption information for over fifty countries).

[5] *See* EIA, *supra* note 4, at 282 (illustrating that wind and solar were each only one and seven percents of the total ten percent attributed to renewable energy). Nonetheless, the U.S. leads the world in wind power generation capacity; BRITISH PETROLEUM, *supra* note 4, at 5 (noting that wind and solar generation capacity are growing at above average rates).

[6] *Cf.* Lincoln L. Davies, *Alternative Energy & the Energy-Environment Disconnect*, 46 IDAHO L.R. 473, 474 (2010) ("An America no longer addicted to oil would be sustainable and secure: a more self-reliant nation . . . where energy consumption and environmental protection fit hand in glove . . . . [B]reaking the nation's oil addiction inevitably demands the simultaneous pursuit of energy and environmental objectives.").

[7] *See, e.g.*, Natural Resources Defense Council, Stop Dirty Fuels, http://www.nrdc.org/energy/dirtyfuels.asp (last visited Apr. 24, 2009) (arguing that "we now face a choice: to set a course for a more sustainable energy future of clean, renewable fuels, or to develop ever-dirtier sources of transportation fuel derived from fossil fuels — at an even greater cost to our health and environment").

[8] *See* CLEAN AIR TASK FORCE, CRADLE TO GRAVE: THE ENVIRONMENTAL IMPACTS FROM COAL 2 (2001), *available at* http://www.catf.us/publications/reports/Cradle_to_Grave.pdf (providing a life-cycle analysis of coal). Run-off from surface piles of mining materials contaminates surface water while groundwater is affected by the dislocation of aquifers. *See id.* (discussing adverse effects of coal extraction and mining). Coal transportation also results in damage to the ambient air. *See id.* at 3 (stating that coal transportation by truck, rail, or "coal slurry pipeline" indirectly or directly affects the air).

[9] *See* E&P FORUM/UNEP, ENVIRONMENTAL MANAGEMENT IN OIL & GAS EXPLORATION & PRODUCTION 17-20 (1997), *available at* www.ogp.org.uk/pubs/254.pdf (identifying the environmental concerns of oil and gas development in a chart); *id.* at 39-49 (providing a list of environmental protection measures for oil and gas development). *Cf.* Press Release, American Geological Institute, Petroleum and the Environment (Mar. 10, 2005), http://www.agiweb.org/news/Petroleum_final.pdf (announcing the release of a report explaining environmental issues associated with petroleum).

[10] *See* 16 U.S.C. §§ 1531-1544 (2006) (prohibiting the unauthorized taking of a listed—endangered or threatened—species or modification of its critical habitat); *see generally* ENERGY & BIODIVERSITY INITIATIVE, EBI REPORT: INTEGRATING BIODIVERSITY INTO OIL & GAS DEVELOPMENT (2007), http://www.theebi.org/products.html (providing guides as to the incorporation of biodiversity protection into the various stages of oil and gas development).

[11] *See generally* Javier Santillan et al., *Environmental Impacts Associated with Manufacturing of Solar and Wind Power Alternative Energy Systems*, 20 REMEDIATION J. 107 (2010), *available at* http://www3.interscience.wiley.com/journal/123308850/abstract?CRETRY=1&SRETRY=0 (summarizing "the environmental impacts associated with raw material extraction and refining, product manufacturing, use, and postuse disposal for photovoltaic (PV) and wind turbine technologies").

[12] *Contra* American Wind Energy Association, Wind Energy and the Environment, http://www.awea.org/faq/wwt_environment.html (last visited Apr. 24, 2010) [hereinafter AWEA] ("Studies have found that even when . . . manufacturing wind turbines and building wind plants . . . are included, wind energy's CO_2 emissions are quite small.").

[13] *See generally* Victoria Sutton & Nicole Tomich, *Harnessing Wind is Not (By Nature) Environmentally Friendly*, 22 PACE ENVTL. L.R. 91 (2005) (arguing that wind energy regulation does not adequately protect endangered species).

[14] *See U.S. Groups Say Vast Areas Off-Limits to Clean Energy*, REUTERS, Apr. 1, 2009, http://www.reuters.com/article/GCA-GreenBusiness/idUSTRE5307A020090401 (noting that the map covers thirteen western states); NRDC, *Clean Energy and Conservation*, http://www.nrdc.org/land/sitingrenewables/default.asp (last visited Apr. 18, 2010) (providing a link to view the map).

[15] *See* Meredith Blaydes Lilley & Jeremy Firestone, *Wind Power, Wildlife, & the Migratory Bird Treaty Act: A Way Forward*, 38 Envtl. L. 1167 (2008) (suggesting that a bat protection act would assist in lowering bat mortality caused by wind projects); *see also* AWEA, *supra* note 12 (comparing sources of human-induced avian mortality and concluding that wind turbines cause far fewer avian deaths than collisions with buildings).

[16] *See* Krasny, *supra* note 2 and accompanying text (declaring approval of the Cape Wind project despite pending litigation); *see also* Sutton, *supra* note 13, at 100-02 (discussing the initial difficulty in assessing and permitting the project due to a lack of agency expertise).

[17] *See* Patrick Cassidy, *Wind Farm Lawsuit May Be Next*, Cape Cod Times, Mar. 19, 2010, http://www.capecodonline.com/apps/pbcs.dll/article?AID=/20100319/NEWS/3190325/-1/special01 (noting that wildlife advocates argue that the biological opinion issued by the federal government does not contain "adequate measures to preserve the [roseate tern and piping plover]" two species of endangered and threatened birds).

[18] *Cf.* U.S. Fish & Wildlife Service, Wind Turbine Guidelines Advisory Committee Recommendations vii (2010), http://www.fws.gov/habitatconservation/windpower/Wind_Turbine_Guidelines_Advisory_Committee_Recommendations_Secretary.pdf (noting that "as the United States moves to expand wind energy production, it also must maintain and protect the nation's wildlife and habitats, which wind energy production can negatively affect"). For a discussion of the European Union's approach to wind projects, *see* Donald Zillman et al., *More Than Tilting at Windmills*, 49 Washburn L.J. 1 (2009).

[19] Animal Welfare Inst. v. Beech Ridge Energy LLC, 675 F. Supp. 2d 540, 579-81 (D. Md. 2009); *see* Maria Glod, *Court Constricts W.Va. Wind Farm to Protect Bats*, Wash. Post, Dec. 10, 2009, http://www.washingtonpost.com/wp-dyn/content/article/2009/12/09/AR2009120904106.html (stating that although the environmental plaintiffs "support wind power as one way to mitigate climate change" that the risks to the bat presented by the wind project as proposed was too great).

[20] *See Beech Ridge*, 675 F. Supp. 2d at 581 ("Outside [the hibernation] period determining the timing and circumstances under which wind turbine operation can occur without danger of the take of an Indiana bat is beyond the competence of this Court, but is well within the competence of the FWS under the ITP process.").

[21] *See* 16 U.S.C. § 1533(a) (authorizing the grant of a permit for the taking of an endangered species that is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity").

[22] *Id.* A comparable authorization to take an endangered species is available for projects with a federal nexus via the § 7 inter-agency consultation process. *See* 16 U.S.C. § 1536.

[23] *Beech Ridge,* 675 F. Supp. 2d at 581 (noting Congressional encouragement to develop of wind energy through the Wind Energy Research and Development Act of 2009, H.R. 3165, 111th Cong. (2009)).

[24] *See* Posting of Todd Woody to Green Blog, http://green.blogs.nytimes.com/2010/02/11/brightsource-alters-solar-plant-plan-to-address-concerns-over-desert-tortoise/ (Feb. 11, 2010, 12:20 EST) (highlighting the threat to the desert tortoise posed by a solar energy project); *Desert Clash in West Over Solar Power, Water*, Associated Press, Apr. 18, 2009, http://www.msnbc.msn.com/id/30283556 (discussing the conflict over water as a result of its use as a cooling agent in solar power generations).

[25] *See* Hadassah M. Reimer & Sandra A. Snodgrass, *Tortoises, Bats, & Birds, Oh My: Protected-Species Implications For Renewable Energy Projects*, 46 Idaho L.R. 545, 572 (2010) (highlighting that desert solar projects could affect the Mohave desert squirrel, burrowing owl, pygmy rabbit, and Amargosa toad).

[26] *See supra* note 14 and accompanying text (providing information about NRDC's renewables map).

[27] *See supra* notes 21-22 and accompanying text (discussing authorizations to take endangered species).

[28] *See generally* Renewable Energy Action Team, Best Management Practices & Guidance Manual: Desert Renewable Energy Projects (2009), http://www.energy.ca.gov/2009publications/CEC-700-2009-016/CEC-700-2009-016-SD-REV.PDF (recommending that "[b]ecause of the potential magnitude of the impacts to desert tortoises from proposed renewable energy projects, FWS and DFG must evaluate translocation efforts on a project-by-project basis in the context of cumulative effects"); Ariz. Game & Fish Dep't, Guidelines For Solar Development In Arizona (2010), http://www.azgfd.gov/hgis/documents/FinalSolarGuidelines03122010.pdf (providing guidelines to protect wildlife habitat, including limiting the spread of non-native, invasive species).

[29] *See supra* note 11 and accompanying text (providing a life-cycle analysis of solar and wind energy).

[30] *See generally* Elizabeth Thomas, *The Myth of a Single, "Green" Power Resource*, 10 Nat. Res. & Env't 65 (1996) (arguing that it is more appropriate to determine whether a certain project is appropriate in a specific location rather than labeling any energy source as green).

Endnotes: Will Climate Change Help or Harm Species Listing? *continued from page 43*

[1] Endangered and Threatened Wildlife and Plants; Reinstatement of Protections for the Grizzly Bear in the Greater Yellowstone Ecosystem in Compliance With Court Order ("Grizzly Bear Final Rule"), 75 Fed. Reg. 1,496 (Mar. 26, 2010) (to be codified at 50 C.F.R. pt. 17).

[2] Greater Yellowstone Coalition, Inc. v. Servheen, 672 F.Supp.2d 1105 (D. Mont. 2009).

[3] Endangered Species Act, 16 U.S.C. § 1531 (1973) (declaring the inherent "esthetic, ecological, educational, historical, recreational, and scientific value" of endangered species to the Nation and all people).

[4] G.M. Brown Jr. & J.F. Shogren, *Economics of the Endangered Species Act*, 12 J. Econ. Perspectives 3, 8-9 (1998).

[5] *See id.* at 8.

[6] *Id.* at 11-13.

[7] 16 U.S.C. § 1531(b) ("The purposes of this Act are to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved. . . .").

[8] *See* Brown & Shogren, *supra* note 5, at 8.

[9] Greater Yellowstone Coal., Inc., 672 F.Supp.2d at 1110. A threatened species is "any species which is in danger of extinction throughout all of a significant portion of its range." 16 U.S.C. § 1532(6).

[10] Designating the Greater Yellowstone Area Population of Grizzly Bears as a Distinct Population Segment; Removing the Yellowstone Distinct Population Segment of Grizzly Bears From the Federal List of Endangered and Threatened Wildlife; 90-Day Finding on a Petition To List as Endangered the Yellowstone Distinct Population Segment of Grizzly Bears ("Grizzly Bear 2007 Rule"), 72 Fed. Reg. 14,866, 14,869 (Mar. 29, 2007) (to be codified at 50 C.F.R. pt. 17).

[11] Great Yellowstone Coal., Inc., 672 F.Supp.2d at 1105.

[12] *Id.*

[13] GYC claimed that "(1) there are inadequate regulatory mechanisms to protect the grizzly once it is delisted; (2) the Service did not adequately consider the impacts of global warming and other factors on whitebark pine nuts, a grizzly food source; (3) the population is unacceptably small and dependent on translocation of outside animals for genetic diversity; and (4) the Service did not properly consider whether the grizzlies were recovered across a significant portion of their range." *Id.* at 1109. The first two claims succeed in court. *Id.* at 1126.

[14] *Id.* at 45.

[15] *Id.* at 24.

[16] Louisa Willcox, *The Good, the Bad, and the Grizzly–The Delisted Yellowstone Grizzly Update from Natural Resources Defense Council*, PBS Nature, http://www.pbs.org/wnet/nature/episodes/the-good-the-bad-and-the-grizzly/the-delisted-yellowstone-grizzly-update-from-natural-resources-defense-council/1036/ (last visited Apr. 12, 2010).

[17] Greater Yellowstone Coal., Inc. , 672 F.Supp.2d at 118.

[18] *See* Willcox, *supra* note 16. The FWS admitted if whitebark pines suffer a slow decline, it will be difficult to notice any changes in the grizzly survival rate. Presented studies portrayed a relationship between the availability of whitebark pine nuts and grizzly bear survival and fecundity rates. Greater Yellowstone Coal., Inc., 672 F.Supp.2d at 1120.

[19] *See* Greater Yellowstone Coal., Inc., 672 F.Supp.2d at 1119 (discussing the disconnect between the studies the agency relies on and its conclusion in its 2007 Rule).

[20] *Id.* at 1126.

[21] "Grizzly Bear Final Rule," 75 Fed. Reg. at 1496.

[22] *See* Russell Prugh & Jessica Farrell, *Despite Apparent Recovery, Climate Change Keeps Grizzly Bears on ESA List*, Marten Law, http://www.martenlaw.com/newsletter/20091019-grizzly-bears-kept-on-esa-list (last visited Apr. 12, 2010).

[23] *See* Greater Yellowstone Coal., Inc., 672 F.Supp.2d at 1119-20.

[24] *See id.* at 1126-27.

[25] The NOAA is also responsible under the ESA to list species and promulgate rules for their protection. 16 U.S.C. § 1536.

[26] NOAA, *Eulachon*, http://www.nwr.noaa.gov/Other-Marine-Species/Eulachon.cfm (last visited Apr. 16, 2010).

[27] *Id.*

NOTES

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