

April 2003

Urban Biosphere Reserves: Integrating Conservation, Community and Sustainability

Jennifer L. Eastman

Follow this and additional works at: <https://scholarship.law.wm.edu/wmelpr>



Part of the [Environmental Law Commons](#), and the [Sustainability Commons](#)

Repository Citation

Jennifer L. Eastman, *Urban Biosphere Reserves: Integrating Conservation, Community and Sustainability*, 27 Wm. & Mary Envtl. L. & Pol'y Rev. 707 (2003), <https://scholarship.law.wm.edu/wmelpr/vol27/iss3/5>

URBAN BIOSPHERE RESERVES: INTEGRATING CONSERVATION, COMMUNITY, AND SUSTAINABILITY

JENNIFER L. EASTMAN*

“Be watchful and strengthen the things which remain,
that are ready to die.”¹

I. INTRODUCTION

The human population is witnessing the seventh mass extinction event of the planet.² At the current rate of habitat destruction, half of the world's species of plants and animals will be extinct by the end of this century.³ Humans are causing unprecedented environmental damage, particularly through historically unseen population growth and expansion across geographic landscapes, as people search for more space in which to live and utilize the environment.⁴ What has been destroyed in the last hundred years will take evolution millions of years to replace.⁵ Over one

* Jennifer Eastman is a 2003 J.D. Candidate attending the College of William and Mary School of Law. Ms. Eastman received a B.A. in Communication from Arizona State University in 1999. She would like to thank her husband, Marc, and son, Gunnar, for the unfailing support, understanding, and encouragement they provide on a daily basis, but particularly during the writing of this Note.

¹ *Revelations* 3:2.

² Edward O. Wilson, *Vanishing Before Our Eyes: Not Since an Asteroid Smacked Earth 65 Million Years Ago Have Animal and Plant Species Died Out So Fast. We Have No Idea What We're Losing*, *TIME*, Apr. 26, 2000, at 28.

³ *Id.* See also ROBERT ENGELMAN ET AL., *PEOPLE IN THE BALANCE: POPULATION AND NATURAL RESOURCES AT THE TURN OF THE MILLENNIUM* (Population Action International 2000); BRUCE A. STEIN & STEPHANIE R. FLACK, *THE NATURE CONSERVANCY, 1997 SPECIES REPORT CARD: THE STATE OF U.S. PLANTS AND ANIMALS* (1997), available for order at <http://www.natureserve.org/publications/library.jsp> (last visited Apr. 15, 2003) (stating that in the United States alone, 526 species are listed as extinct or missing, including 110 species presumed extinct and another 416 species possibly missing. Compared to the estimated 100,000 named native species, and the 20,000 regularly occurring native species, this number is arguably quite large).

⁴ *Biodiveristy: A Friend for Life*, *UNESCO COURIER*, May 2000, at 16 [hereinafter *Friend*]. See also ENGELMAN ET AL., *supra* note 3.

⁵ Wilson, *supra* note 2, at 28.

billion people live in the world's biodiversity hotspots, areas high in concentration of unique species that are under serious threat from human activity.⁶ The population in all twenty-five worldwide hotspots is growing almost forty times faster than the population of the world overall.⁷ The future looks bleak. Immense population growth, demands for natural resources, effects of globalized trade patterns on rural communities, and unequal spread of technological advancements are imperiling the future of biodiversity and humankind.⁸

The term biodiversity "refers to the full array of life on Earth."⁹ Biodiversity includes not only plant and animal species, but the entire hierarchy of biology, including the levels of genetics, species, and ecosystems.¹⁰ The depletion of natural resources by man and the continual increase in global population has had a severe effect on the earth's biodiversity.¹¹ Man and nature are involved in a "necessary relationship," where human progress must conform to basic ecological precepts and human needs in order to endure.¹² The concept of sustainable development stresses the need to reconcile and integrate environmental and developmental goals in order to ensure human survival.¹³ Sustainable development is based on the idea that human progress must conform to basic ecological precepts and human needs in order to endure.¹⁴ Sustainable development is defined as development that "meets the needs of the present without compromising the

⁶ ENGELMAN ET AL., *supra* note 3.

⁷ *Id.*

⁸ See United Nations Educational, Scientific, and Cultural Org. (UNESCO), *The Seville Strategy for Biosphere Reserves*, 31 NATURE AND RESOURCES 2, 4 [hereinafter *Seville Strategy*].

⁹ Bruce A. Stein, *A Fragile Cornucopia: Assessing the Status of U.S. Biodiversity*, 43 ENVIRONMENT 11 (Sept. 2001).

¹⁰ *Id.*

¹¹ See *id.*

¹² See Catherine Larrere, Editorial, *A Necessary Partnership with Nature*, UNESCO COURIER, May 2000, at 17.

¹³ WORLD COMM'N ON ENV'T AND DEV., OUR COMMON FUTURE (1987) [hereinafter OUR COMMON FUTURE].

¹⁴ *Id.*

ability of future generations to meet their own needs.”¹⁵ Thus, sustainable development stands for the idea of responsible development, recognizing that development is inevitable, yet subjecting developers to a duty to maintain a viable environment for the future.

The biosphere reserve is one concept for promoting ideas of sustainable development. Biosphere reserves were first created by the United Nations Education, Scientific and Cultural Organization’s (“UNESCO”) Man and the Biosphere Program (“MAB”) in 1974 as areas that conserve biodiversity, promote economic development, and maintain cultural values of the region.¹⁶ Biosphere reserves seek to conserve biodiversity by creating zones of conservation, while monitoring and researching the biodiversity within those zones, and educating people of the community about sustainable development and conservation principles.

Biosphere reserves are unique in that central to their management is understanding and maintaining cultural values of the local area. Indigenous people may develop hostile attitudes toward conservation efforts of biosphere reserves if the conservation areas are created without regard for the impact such restrictions will have on the people’s daily habits and traditional uses of the land.¹⁷ People who have traditionally used the protected areas for food, grazing land, sources of timber, or simply to travel through may disrupt conservation efforts.¹⁸ Biosphere reserves seek to educate local people in the ideas of sustainable development by allowing the people some benefit from

¹⁵ *Id.*

¹⁶ Michel Batisse, *Biosphere Reserves: A Challenge for Biodiversity Conservation & Regional Development*, 39 ENVIRONMENT 10 (June 1997) [hereinafter *Biodiversity Challenge*]; Susan R. Fletcher, *Biosphere Reserves and the U.S. MAB Program*, CRS REPORT FOR CONGRESS OC RS20220, at CRS-1 (June 4, 1999), <http://cnie.org/nle/crsreports/biodiversity/biodv-28.cfm>.

¹⁷ *Biodiversity Challenge*, *supra* note 16, at 10. See also Marc R. Poirer, *Property, Environment, Community*, 12 J. ENVTL. L. & LITIG. 43 (“[E]ven when environmentalists and Native Americans work alongside one another to protect an endangered species and a rare ecosystem, they may have different goals and understandings. It is important and useful to bring this sensitivity about the interests and values of different communities to bear in debates about land use, property, and environment.”) *Id.* at 68.

¹⁸ *Biodiversity Challenge*, *supra* note 16, at 10.

the conservation efforts, as well as a "say in how natural resources are used."¹⁹

There are over 350 biosphere reserves in over eight-five countries today.²⁰ The majority of these designations are located in rural areas with low population density.²¹ "Cultural conservation" and education of urban dwellers are minimized, as there are hardly any people living within proximity to most reserves.²² However, this fact is beginning to change. Designation of biosphere reserves is occurring closer to cities, particularly in Europe.²³ Similarly, as development expands and population grows, urban areas are growing closer to reserves designated in areas previously isolated from human settlement.²⁴ It is becoming increasingly important to the management of biosphere reserves, and the MAB Program in general, to consider the importance and effect of the interrelationship between biosphere reserves and urban or suburban areas.²⁵ The MAB Program is putting more emphasis on sustainable development ideas, as well as economic benefits,

¹⁹ *Id.* at 13. Batisse writes:

These people should receive some benefits from the reserve and become, at least to a certain extent, custodians of its biodiversity. The term "local people" . . . encompasses the indigenous peoples who have always lived on and derived their living from the site, long-settled farmers, recent immigrants in search of new land, large landowners, and wealthy residents living in second homes, as well as a variety of urban communities.

Id. See also Oliver Houck, *On the Law of Biodiversity and Ecosystem Management*, 81 MINN. L. REV. 869, 877 (1997) ("[O]nce diversity and ecosystems are defined in terms of existing or future human activities, the terms lose whatever science and objectivity they may have had. Ecosystems become simply whatever humans want them to be, and the concept migrates, like 'multiple use,' towards a standardless, subjective call.")

²⁰ Fletcher, *supra* note 16, at CRS-1.

²¹ Peter Frost, *Urban Biosphere Reserves—Re-Integrating People with the Natural Environment*, TOWN & COUNTRY PLANNING, July/Aug. 2001, at 213.

²² See *id.*

²³ UNESCO, *Application of the Biosphere Reserve Concept to Urban Areas and Their Hinterlands*, Advisory Committee for Biosphere Reserves, Fifth Meeting, Paper SC-97/CONF. 502/4, at 2 (1998), <http://unesco.org/mab/mabicc/2000/eng/Urban.htm> [hereinafter *Urban MAB*].

²⁴ *Id.*

²⁵ *Id.*

that may be realized by these settled, urban areas that exist close to biosphere reserves.²⁶ As cities are by far the greatest ecological consumers, bringing the objectives of sustainable development to the attention of urban dwellers may help in reducing the threat to biodiversity presently at hand.²⁷

This Note argues that one solution to conservation of natural resources and the aggrandizement of sustainable development in the world's more populated regions is fostering biosphere reserves in and around urban areas. Part II addresses environmental declinations that call for immediate and long terms solutions in areas of high population. Biosphere reserves historically were developed in areas of low population, in order to meet the requirements of the zoning structure of the biosphere program, as well as the goals and functions of the program. Part III discusses the history and development of biosphere reserves, including controlling governing bodies and documents currently implementing change within the biosphere reserve system. Part IV explains why developing biosphere reserves in and around urban areas is a viable solution. Part V suggests ways that cities could implement biosphere reserves in and around their borders, and what benefits, both environmentally and socially, the reserve programs could provide. While this Note strongly supports the development of biosphere reserves in urban areas, Part VI will consider the arguments against such a proposal, and the final section will argue how these problems can be overcome. This Note concludes that urban biosphere reserves may meet the flexible criteria required for designation, and will definitely fulfill the functions of the reserve program, namely, conservation, development, and research.

II. WHY BIOSPHERE RESERVES ARE NEEDED

"It is generally acknowledged that the principal cause of biodiversity loss is the fragmentation, degradation, and destruction of ecosystems and habitats through conversion of land to economically productive uses, especially agriculture, forestry, mineral and fossil fuel extraction, and urban

²⁶ *Id.*

²⁷ See Wilson, *supra* note 2; see also ENGELMAN ET AL., *supra* note 3.

development."²⁸ Humans are responsible for many types of biodiversity loss, stemming from conversion of natural habitat by development, pollution, over-fishing, and global warming.²⁹ Only twenty species provide ninety percent of the food supply for the global population.³⁰ Three species equal more than half of the food sustaining the world.³¹ While such few species provide the bulk of the world's food, there are thousands of species that could be grown or genetically developed to increase food production in marginal habitats, such as deserts.³² City dwellers are exploiters of natural resources, generating more energy consumption within city borders, resulting in higher levels of pollution and waste materials outside the city boundaries.³³

The United States contains more biomes and ecoregions than any other country in the world, yet states such as Alabama have lost up to ninety-

²⁸ Bradley C. Karkkainen, *Biodiversity and Land*, 83 CORNELL L. REV. 1, 7 (1997) (citations omitted). See also C.S. HOLLING ET AL., BIODIVERSITY LOSS: ECONOMIC AND ECOLOGICAL ISSUES 44, 78-83 (Charles Perrings et al. eds., 1995) ("The factors that have had the greatest impact on species loss include loss of habitat (conversion to 'agroscares' or urban complexes), harvesting/hunting, altered fire regimes, direct changes in herbivory (e.g., by livestock grazing), introduced predators and diseases, home-range/habitat fragmentation and atmospheric changes."); PETER JENKINS, BIODIVERSITY AND THE LAW 105 (William J. Snape, III ed., 1996). Jenkins writes:

[E]xotics are the most overlooked threat to native biodiversity. Aside from causing or contributing to the extinction of native species, invasions of exotics result in biological homogeneity as pests and weeds achieve global ranges — the opposite of biological diversity. Human developments, and their associated habitat destruction or disturbance, create opportunities for invasions by 'weedy,' human-adapted generalists like starlings and rats.

Id. at 106-07.

²⁹ Kal Raustiala & David G. Victor, *Biodiversity Since Rio: The Future of the Convention on Biological Diversity*, 38 ENVIRONMENT 17, 18 (May 1996) [hereinafter *Rio*]. See generally, J.A. MCNEELY ET AL., GLOBAL BIODIVERSITY ASSESSMENT (B.H. Heywood & R.T. Watson eds., 1995).

³⁰ Wilson, *supra* note 2, at 28. Consider also that historically, humans have utilized over 7,000 plant species for food. *Id.*

³¹ These species are maize, wheat, and rice. *Id.*

³² *Id.*

³³ *Urban MAB*, *supra* note 23.

six species, and California has named thirty-five extinctions.³⁴ The intensive conversion of land in this country has had a severe effect on all species.³⁵ Pressures created by high population densities and economic activities are virtually ignored by conservation efforts, while conventionally protected areas, which have historically been cultivated in areas free from human impact, ignore areas utilized by humans, yet rich in biodiversity.³⁶

³⁴ Stein, *supra* note 9, at 11. These states are particularly susceptible to the possibility of species extinction because of their unique geological history, which has spawned the development of many species particular to their geographic area alone. *Id.*

Twenty-four species are presumed extinct and seventy-four possibly extinct in Alabama. Alabama holds an exceptionally rich variety of freshwater fauna, due to the state's 235,000-plus miles of waterways which span three major river basins. Avoiding certain Ice Age mass extinctions allowed the flora and fauna in this area to continue developing and evolving during this period of major geologic disruptions. High levels of extinction are the result of the damming and altering of these waterways, which have caused severe depletion problems among the habitat, particularly for freshwater mussels and aquatic snails. STEIN & FLACK, *supra* note 3.

California is the third most extinction-prone state in the United States. With its unique geological heritage, California is home to a diversified collection of plant and animal species, many of which are found only in California, and several in strictly localized areas. The population boom in California has wrecked havoc on the state's wildlife—of the twenty-five presumed extinct and twenty-one possibly extinct species, more than half (twenty-four) are plant species. *Id.*

³⁵ Stein, *supra* note 9. Conversion occurs when land in a natural state is developed for agriculture or urbanization, or depleted of natural resources. *Id.*

³⁶ See *Biodiversity Challenge*, *supra* note 16, at 8. Batisse writes:

Nature has been considerably transformed in many parts of the world, especially those regions where human societies have had a long and massive impact. But even these regions still contain many elements of extremely valuable biodiversity, including landscapes and species that should be maintained for future generations. . . . On the one hand, there are the basic needs of an expanding population that will continue to grow rapidly in the developing world during the first half of the coming century in spite of a general decrease in fertility rates. On the other hand, there are the excessive demands placed on natural resources primarily by the industrialized countries. The accumulation of these ubiquitous pressures is leading to a rapid and abundantly publicized erosion of biological diversity.

Id.

Historically, conservation efforts in the United States focused on a small percentage of the country's biological wealth, typically scenic lands of limited economic value.³⁷ Programs that sustain biodiversity on much larger geographic scales are needed to target effective conservation efforts and halt the massive destruction of ecosystems.³⁸ Effective programs must enforce strict conservation regulations.³⁹ Yet such programs must allow adjustments for social, economic and cultural changes, creating conservation areas that retain connection to the world around them.⁴⁰

³⁷ Stein, *supra* note 9, at 11. "As a result, the nation is well endowed with 'rock and ice' parks that offer spectacular vistas and inspiring recreational experiences." Several United States park lands were originally designated for conserving and appreciating their geological characteristics, while ignoring "equally impressive wildlife and ecosystem functions." *Id.*

³⁸ *See id.* The large scale ecological process necessary to sustain biodiversity "suggests the need for a more biologically rational strategy for targeting conservation efforts and for strategies that address larger geographic scales." *Id.*

³⁹ *Biodiversity Challenge*, *supra* note 16, at 8-9.

⁴⁰ *Id.* Batisse argues that since biodiversity encompasses the "entirety of life's vast spectrum" any measures taken to conserve biodiversity must include ex situ conservation, the two traditional forms of conservation have encompassed in situ ideals, namely, national parks and biological reserves. *Id.* at 6. Strict national governance of these areas prohibits flexibility, visionary evolution, and community inclusion of management and development of conservation techniques. *Id.* at 9. Ex situ conservation is defined by the Convention on Biological Diversity as "conservation of components of biological diversity outside their natural habitats," while in situ conservation refers to "the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings, ... [or] in the surroundings where they have developed their distinctive properties." Convention on Biological Diversity, June 5, 1992, art. 2 [hereinafter CBD]. Ex situ conservation, while prominent in the Convention, is clearly secondary to in situ conservation efforts. *See id.* art. 9. *See also Rio*, *supra* note 29, at 20.

III. HISTORY AND DEVELOPMENT OF THE MAN AND BIOSPHERE (MAB) PROGRAM

A. *The History of Biosphere Reserves*

The first major intergovernmental meeting to examine the issues of biodiversity conservation within a biosphere setting was the UNESCO conference on the Conservation and Rational Use of the Biosphere, held in 1968.⁴¹ The MAB Program was conceived in 1971, taking a new stance in ecosystem conservation by emphasizing the role of humans as a major environmental force.⁴² The MAB Program first conceptualized the idea of biosphere reserves in 1974, in an effort to create areas that would simultaneously fulfill goals of conservation of biodiversity, support sustainable economic development, while maintaining and respecting local cultural values.⁴³ Biosphere Reserves were developed to support conservation of biodiversity, "to maintain healthy ecosystems", to teach people about "natural systems" and how they change, to teach "traditional forms of land-use, . . . [to allow people] to share knowledge on how to manage natural resources in a sustainable way," and to foster global cooperation in conflict resolution of biodiversity issues.⁴⁴ MAB began designating areas as biosphere

⁴¹ *Biodiversity Challenge*, *supra* note 16, at 10. See also *Biosphere Reserves In a Nutshell: The Origin of Biosphere Reserves*, at <http://www.unesco.org/mab/nutshell.htm> (last visited Apr. 1, 2003); *Biosphere Reserves In a Nutshell: What Is a Biosphere Reserve?* at <http://www.unesco.org/mab/nutshell.htm> (last visited Apr. 1, 2003) [hereinafter *What Is a Biosphere Reserve*].

⁴² Bernd von Droste, *Sustainable Development (A Compromise Between Development and Conservation)*, UNESCO COURIER, Oct. 1987, at 4. See also *Biodiversity Challenge*, *supra* note 16, at 10; Fletcher, *supra* note 16, at CRS-2.

⁴³ Frost, *supra* note 21, at 213. See also *Biodiversity Challenge*, *supra* note 16, at 10; *What Is a Biosphere Reserve*, *supra* note 41; *The Seville Strategy*, *supra* note 8, at 2.

⁴⁴ *Why Do We Need Biosphere Reserves*, *supra* note 41. See also Frost, *supra* note 21, at 213-14; *Seville Strategy*, *supra* note 8, at 2; *Statutory Framework of the World Network of Biosphere Reserves*, at <http://www.euromab.org/publications/framework.html> (last visited Apr. 1, 2003) [hereinafter *Statutory Framework*]; von Droste, *supra* note 42, at 2 ("[E]cologists in MAB were no longer saying 'Stop doing that or you will destroy the environment'. Rather

reserves in 1976, mainly through national parks or already protected areas, which already met some of the criteria necessary for designation.⁴⁵ Three major objectives were determined:

- [1] [R]einforce the extent and relevance of the conservation of biological diversity, including genetic resources, through a world system of protected areas;
- [2] [E]nsure the harmonious co-existence of rural populations and the ecosystems from which they derive their subsistence and income; [and]
- [3] [P]rovide basic and applied researchers with a number of permanent field sites that could be used as a network of information exchange.⁴⁶

The MAB Program "stressed the need for an integrated, interdisciplinary rather than multi-disciplinary approach and brought the social sciences into ecological research as an equal partner with the natural sciences."⁴⁷ Biosphere Reserves have three major complementary functions as determined by the MAB Program:

they were saying 'Try doing this and you can enjoy the benefits of development and conserve the environment'."); UNESCO, *Fact File, The World Network*, UNESCO COURIER, May 1997, at 36 [hereinafter *Fact File*] ("[Biosphere reserves] are places where issues can be debated by all the stakeholders concerned: scientists, local farmers, fishermen, politicians, private enterprises and nature conservation associations.").

⁴⁵ See *Biodiversity Challenge*, *supra* note 16, at 10; see also *What Is a Biosphere Reserve*, *supra* note 41, at 3 ("The name Biosphere Reserve was chosen in the early 1970s to identify these special, experimental sites with the MAB Programme."). See also *Seville Strategy*, *supra* note 8, at 2; Frost, *supra* note 21, at 213.

⁴⁶ See *Biodiversity Challenge*, *supra* note 16, at 10 ("From the beginning, MAB was meant to be an interdisciplinary and problem-oriented effort that would address among others [these] three major objectives in particular. . . . These objectives corresponded with the three basic functions of what eventually came to be known as a biosphere reserve.").

⁴⁷ von Droste, *supra* note 42.

- [1] A conservation function—to contribute to the conservation of landscapes, ecosystems, species and genetic variation;
- [2] A development function—to foster economic and human development which is socio-culturally and ecologically sustainable;
- [3] A logistic function to provide support for research, monitoring, education and information exchange related to local, national and global issues of conservation and development.⁴⁸

While the combined presence of all three functions is necessary for designation, each biosphere reserve fulfills these functions in different degrees depending on the location of the reserve.⁴⁹ The functions attempt to respond to the loss of biodiversity experienced globally, while supporting the objectives of sustainable development.

B. *The Convention on Biodiversity*

An additional international response to the dire threat to biodiversity described above is the Convention on Biodiversity, adopted at the 1992 Earth Summit in Rio de Janeiro.⁵⁰ The Convention is the first international treaty

⁴⁸ *What Is a Biosphere Reserve?*, *supra* note 41; *See also Biodiversity Challenge*, *supra* note 16, at 12; Batisse, *New Prospects for Biosphere Reserves*, 22 ENVTL. CONSERVATION 4, 367 (1995) [hereinafter *New Prospects*]; *Seville Strategy*, *supra* note 8, at 3; *Statutory Framework*, *supra* note 44; *Fact File*, *supra* note 44.

⁴⁹ *What Is a Biosphere Reserve?*, *supra* note 41. *See also Biodiversity Challenge*, *supra* note 16, at 12 (“Depending on local conditions, a biosphere reserve will naturally fulfill these three functions to different degrees, but their combined presence is required in all cases.”); *New Prospects*, *supra* note 48, at 367 (“[I]ts three basic functions are meant, at least to some extent, to be combined in each site . . .”).

⁵⁰ *Sustaining Life on Earth: How the Convention on Biodiversity Promotes Nature and Human Well-Being*, Convention on Biological Diversity website, (Dec. 13, 2002) at <http://www.biodiv.org/doc/publications/guide.asp>. *See also* CBD, *supra* note 40, at 1 (stating “Concerned that biological diversity is being significantly reduced by certain human activities, Aware of the general lack of information and knowledge regarding biological

to specifically utilize an all-encompassing, ecosystems-based focus in the conservation of biodiversity.⁵¹ The Convention proclaims that biodiversity is a global concern, yet specifically reaffirms state control over natural resources within countries.⁵² The Convention on Biodiversity names three central objectives: conservation of biodiversity, promotion of sustainable development, and "equitable sharing of benefits and genetic resources" between regions and nations.⁵³

The benefit of the treaty in the protection of biodiversity lies not in the development of specific mandates for national territories to abide by, but instead in "the consensual interpretation of principles, concepts and obligations."⁵⁴ To fulfill its declarations, the parties to the treaty must focus on prioritizing conservation and sustainability problems and improving relevant indicators.⁵⁵ While the Convention "endorses the concepts of

diversity and of the urgent need to develop scientific, technical and institutional capacities to provide the basic understanding upon which to plan and implement appropriate measures").

The CBD was signed at the United Nations Conference on Environment and Development. The Convention entered into force in 1993, and since has been ratified by over 130 countries. The United States has signed, but not yet ratified, the Convention. The Convention sets out broad objectives, but leaves the task of implementation to individual governments. *See Biodiversity Challenge*, *supra* note 16, at 33 n.2.

⁵¹ *Rio*, *supra* note 29, at 20.

⁵² *Id.* (resolving the conflict between biodiversity as a global concern and recognizing the necessity of state control over national resources is a major challenge worldwide).

⁵³ *Id.* See also CBD, *supra* note 40, art. 1, which states the objectives of the Convention as: conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.

⁵⁴ *Rio*, *supra* note 29, at 40.

⁵⁵ *Id.* The future of the treaty will be found "less in the development of specific rules than in the consensual interpretation of principles, concepts, and obligations." See also Governance for Sustainable Development, WHAT Governance Programme: A Joint Initiative of the World Humanity Action Trust (WHAT), UNED Forum and Global Legislators Organisations for a Balanced Environment (GLOBE) Southern Africa, Paper #4 [hereinafter Paper #4],

sustainable use and the sound management of biological resources for human use and betterment,”⁵⁶ the specific discussion of the “‘intrinsic’ [sic] worth of biodiversity” seems to indicate a preservationist view that considers human needs and sustainability secondary to the broader set of ethical concerns.⁵⁷

The Convention on Biodiversity (“CBD”) was a huge international step in realizing the importance of setting up programs and regulations to protect our ecosystems. However, there is little in place to actually implement the ideas of the treaty.⁵⁸ “The global community needs working examples that encapsulate the ideas of the Rio Conference. Such examples can only work if they express all the social, cultural, spiritual and economic needs of society and are also based on sound science.”⁵⁹ Biosphere Reserves, in fact, are one of the few programs that utilize the ideas and concerns of the Convention to create safety zones for the protection of biodiversity.⁶⁰

which states:

One of the greatest disappointments for those who worked hard for a meaningful agreement at the Earth Summit in 1992 has been the general lack of political commitment from government, institutions and civil society for the implementation of sustainable development. The failure to adequately protect environmental integrity and support social welfare on the ground is largely due to a lack of coherent, forward-looking and integrated global-local frameworks for sustainable development.

⁵⁶ *Rio*, *supra* note 29, at 40.

⁵⁷ *Id.* The ethical concerns of the parties to the Convention include commitment to the safety of biotechnology and a global view of conservation which acknowledges “states have sovereign rights over their own biological resources.” *Id.* at 37. The sovereign rights discussion stretched to a debate over genetic innovations and religious principles. International intellectual property rights law became a contentious topic. *See id.* at 37-39.

⁵⁸ *See Biodiversity Challenge*, *supra* note 16. “[T]he world community formally adopted the ...[CBD] in 1992 and since that time has been making a slow but steady effort to implement it.” *Id.* at 6. “[I]t constitutes a rather cumbersome legal instrument that sets out broad objectives without indicating how they can be met.” *Id.* at 33 n.2. *See also* Paper #4, *supra* note 55.

⁵⁹ *What Is a Biosphere Reserve*, *supra* note 41.

⁶⁰ *See id.*; *Fact File*, *supra* note 44, at 36 (“[Biosphere Reserves] contribute to meeting the objectives of the Convention on Biological Diversity and Agenda 21 that resulted from the 1992 United Nations Conference on the Environment and Development held in Rio de Janeiro.”). *See also Seville Strategy*, *supra* note 8, at 2 (“Biosphere reserves promote this

C. *Development of Seville Strategy*

Building off the principles of biodiversity conservation established by the CBD, UNESCO convened the International Conference on Biosphere Reserves in Seville, Spain, in March, 1995.⁶¹ "The Seville Conference brought together 387 participants from 102 countries, and 15 international and regional organizations."⁶² The "major outgrowth [of the conference] was the unanimous adoption of a common platform for action, known as the Seville Strategy for Biosphere Reserves."⁶³ The Seville Strategy sought to link the biosphere reserves through an international network, and improve biospheres' coverage of areas around the world.⁶⁴ Building off the principles of biodiversity conservation established by the CBD, the Seville Strategy "identifies the specific role of biosphere reserves in developing a new vision of the relationship between conservation and development."⁶⁵

integrated approach and are thus well-placed to contribute to the implementation of the Convention.").

⁶¹ *Seville Strategy*, *supra* note 8, at 2. *See also Biodiversity Challenge*, *supra* note 16, at 10; *What Is a Biosphere Reserve*, *supra* note 44.

Biosphere Reserves therefore have a new role to play at the global level. Not only will they be a means for the people who live and work within and around them to attain a balanced relationship with the natural world, they will also explore how to meet the needs of society, as a whole, by showing the way to a more sustainable future.

Id. at 3.

⁶² *Seville Strategy*, *supra* note 8, at 2 n.1.

⁶³ *Biodiversity Challenge*, *supra* note 16, at 10.

⁶⁴ *Id.* at 10, 12. New methodologies, new kinds of reserves, and new international networks "have greatly facilitated communication and co-operation between biosphere reserves in different countries." *Seville Strategy*, *supra* note 8, at 3. *See also Statutory Framework*, *supra* note 44 ("In combining the three functions . . . biosphere reserves should strive to be sites of excellence to explore and demonstrate approaches to conservation and sustainable development of a regional scale."); Frost, *supra* note 21, at 213 ("[T]he *Seville Strategy* proposed a much wider and more far reaching role for biosphere reserves in the 21st century . . .").

⁶⁵ *Seville Strategy*, *supra* note 8, at 5. *See also Statutory Framework*, *supra* note 44.

The Seville Strategy reaffirmed the purposes and functions of biosphere reserves as set out by the initial MAB Conference, and updated the goals of the program within these functions.⁶⁶ The three functions remained the same—conservation, development, and logistic, while adding ideas of sustainability into a previously conservation-heavy conception.⁶⁷ The Seville Strategy offers only general recommendations, as each biosphere reserve is subject to the governance of its locality, but outlines ninety tasks to be performed at various regional levels that allow for progression toward the goals of the reserve, as well as monitoring and evaluation of the research conducted.⁶⁸ Out of these ninety tasks, the Conference identified ten key directions that serve as the foundations of the Strategy:

1. Strengthen the contribution which biosphere reserves make to the implementation of international agreements promoting conservation and sustainable development, especially to the Convention on Biological Diversity . . .
2. Develop biosphere reserves that include a wide variety of environmental, biological, economic and

⁶⁶ See *Biodiversity Challenge*, *supra* note 16, at 10. See also *Introduction to Statutory Framework*, *supra* note 44; *Seville Strategy*, *supra* note 8, at 3.

⁶⁷ See *Biodiversity Challenge*, *supra* note 16, at 13 (“This very ambitious vision places biosphere reserves in a broader framework in each country by incorporating their function of conserving biological diversity which remains the top priority, into the challenge of planning and managing land use and ecosystems in the best interests of humankind.”). See also *Seville Strategy*, *supra* note 8, at 5.

⁶⁸ See *Biodiversity Challenge*, *supra* note 16.

Because every site is specific and local conditions around the world are extremely diverse, the Seville Strategy can offer only general recommendations about how to go about this process [I]t enumerates no less than 90 tasks that should be performed at either the global, national, or individual site level and outlines a set of performance indicators that should allow progress toward these goals to be measured and evaluated over the next decade.

Id. at 12. See also *New Prospects*, *supra* note 48, at 367. See generally *Seville Strategy*, *supra* note 8.

cultural situations, going from largely undisturbed regions and spreading toward cities. . . . [particularly] in the coastal and marine environment.

3. Strengthen the emerging regional, inter-regional and thematic networks of biosphere reserves as components within the World Network of Biosphere Reserves.
4. Reinforce scientific research, monitoring, training and education in biosphere reserves. . . .
5. Ensure that all zones of biosphere reserves contribute appropriately to conservation, sustainable development and scientific understanding.
6. Extend the transition area to embrace large areas suitable for approaches, such as ecosystem management, and use biosphere reserves to explore and demonstrate approaches to sustainable development at the regional scale
7. Reflect more fully the human dimensions of biosphere reserves. Connections should be made between cultural and biological diversity. Traditional knowledge and genetic resources should be conserved and their role in sustainable development should be recognized and encouraged.
8. Promote the management of each biosphere reserve essentially as a 'pact' between the local community and society as a whole. Management should be open, evolving and adaptive. Such an approach will help ensure that biosphere reserves—and their local communities—are better placed to respond to external political, economic, and social pressures.
9. Bring together all interested groups and sectors in a partnership approach to biosphere reserves both at site and network levels. Information should flow freely among all concerned.

10. Invest in the future. Biosphere reserves should be used to further our understanding of humanity's relationship with the natural world, through programmes of public awareness, information and formal and informal education, based on a long-term, inter-generational perspective.⁶⁹

D. *Required Territorial Components of Biosphere Reserves*

An effective biosphere reserve requires a complex combination of people working to preserve the land of the reserve, follow the guidelines of the MAB program, and develop a working relationship with the local community.⁷⁰ This involves intense collaboration between natural scientists and social scientists, conservationists and development groups, as well as local and national government authorities and interested communities.⁷¹ For admission to the World Network of Biosphere Reserves, certain criteria must be met and certain conditions maintained to fulfill the conservation, development, and logistic functions.⁷² These regulations are broadly defined. The biosphere reserve concept is remarkable for its flexibility and creativity

⁶⁹ *Seville Strategy*, *supra* note 8, at 4, 5.

⁷⁰ *See id.* at 2. *See also Biodiversity Challenge*, *supra* note 16, at 13. The statement of the delegates to the Seville Strategy emphatically states that, "[r]ather than forming islands in a world increasingly affected by severe human impacts, biosphere reserves' . . . will 'also contribute to the needs of society as a whole, by showing a way to a more sustainable future.'" *Id.* *See also Seville Strategy*, *supra* note 8.

⁷¹ *See Seville Strategy*, *supra* note 8, at 3.

⁷² *See id.* *See also What Is a Biosphere Reserve*, *supra* note 41 ("[Biosphere] Reserves are nominated by national governments; each reserve must meet a minimal set of criteria and adhere to a minimal set of conditions before being admitted to the Network."). As of June of 1999, there are 356 Reserves located in over 85 different countries that have met the required criteria and been officially designated a Biosphere Reserve by the MAB Programme; Fletcher, *supra* note 16, at CRS-1. *See also Biodiversity Challenge*, *supra* note 16, at 12; *Statutory Framework*, *supra* note 44, arts. 4, 5; *Fact File*, *supra* note 44 (listing 336 reserves in 85 countries as of April of 1997). There are 47 reserves in the United States alone. Fletcher, *supra* note 16, at CRS-1.

in developing reserves in a myriad of environmental circumstances.⁷³ Qualifications of a geographic area for designation by the World network as a biosphere reserve typically require that the area:

- be representative of a major biogeographic region, including a gradation of existing human intervention;
- contain landscapes, ecosystems, or animal and plant species or varieties which need protecting;
- provide an opportunity to explore and demonstrate approaches to sustainable development within the larger region where the Reserves are located;
- have an appropriate zoning system, with a legally constituted core area or areas devoted to long-term protection, a clearly identified buffer zone or zones, and an outer transition area.⁷⁴

The zoning system is the most important part of the biosphere reserve. The spatial flexibility of the zoning plan is a tremendous benefit to the biosphere reserve designation because it allows individual characteristics of each biosphere reserve area creative consideration when undertaking the zoning process.⁷⁵ Research conducted in the core areas of the reserves, areas

⁷³ See *Seville Strategy*, *supra* note 8, at 3: "[O]ne of the greatest strengths of the biosphere reserve concept has been the flexibility and creativity with which it has been realized in various situations." See also Martin F. Price, *People in Biosphere Reserves: An Evolving Concept*, 9 SOC'Y AND NAT. RESOURCES 645. Price writes:

Biosphere reserves have three characteristics that, at least in principle, differentiate them from other protected areas. First, they are part of an international system of sites designated by UNESCO, rather than by national governments. Second, their outer boundary is flexible, rather than being legally defined. Third, the land and water they contain is administered and managed by more than one agency or owner. In fact, only the first of these characteristics defines all biosphere reserves.

Id.

⁷⁴ *Fact File*, *supra* note 44.

⁷⁵ *Biodiversity Challenge*, *supra* note 16, at 12. See also *Seville Strategy*, *supra* note 8, at 3; *Biosphere Reserves In a Nutshell: How Are Biosphere Reserves Organized?*,

relatively unaffected by human activity, can be compared with that in the buffer and transition areas marred by human activity.⁷⁶ Each zone—the core area, buffer zone, and transition area—has its own purposes and goals.⁷⁷

The core area (or areas), the inner-most zone, is protected for long-term conservation objectives, and needs to be sufficiently large to meet these objectives.⁷⁸ Core areas need to be legally established to provide long-term protection.⁷⁹ Normally, core areas are subject only to minimal, necessary human activity.⁸⁰ Activities in core areas include conservation of biodiversity, research and monitoring of minimally disturbed ecosystems, and other low-impact, non-destructive uses including research and education, and possibly traditional uses by indigenous peoples.⁸¹ Core areas are generally publicly

<http://www.unesco.org/mab/nutshell.htm> [hereinafter *How are Biosphere Reserves Organized*] (“Although presented schematically as a series of concentric rings, the three zones are usually implemented in many different ways to accommodate local geographic conditions and constraints. This flexibility allows for creativity and adaptability, and is one of the greatest strengths of the concept.”).

⁷⁶ *Fact File*, *supra* note 44.

⁷⁷ *Id.* See also *How Are Biosphere Reserves Organized*, *supra* note 75; *Seville Strategy*, *supra* note 8, at 3. Mirilia Bonnes et al., *The UNESCO-MAB Biosphere Reserve in the Green Areas of Rome*, March 2001, at 4, available at <http://www.unesco.org/mab/urban/docs/htm>; *Fact File*, *supra* note 44, at 36; Fletcher, *supra* note 16, at CRS-2, CRS-3; *Statutory Framework*, *supra* note 44, art. 4.

⁷⁸ *Biodiversity Challenge*, *supra* note 16, at 12; *How Are Biosphere Reserves Organized*, *supra* note 75; Frost, *supra* note 21, at 213; *Statutory Framework*, *supra* note 44, art. 4(5)(a); *Fact File*, *supra* note 44, at 36; Fletcher, *supra* note 16, at CRS-3.

⁷⁹ *Biodiversity Challenge*, *supra* note 16, at 12; See also *How Are Biosphere Reserves Organized*, *supra* note 75; Frost, *supra* note 21, at 213; Fletcher, *supra* note 16, at CRS-3; *Fact File*, *supra* note 44, at 36.

⁸⁰ *How Are Biosphere Reserves Organized*, *supra* note 75; See also *Seville Strategy*, *supra* note 8, at 3; Fletcher, *supra* note 16, at CRS-3; *Biodiversity Challenge*, *supra* note 16, at 10. “As a matter of fact, a number of hard-core conservationists became rather upset when it became clear that biosphere reserves were going to allow people to be present in managed protected areas.” Michel Batisse, *Developing and Focusing the Biosphere Reserve Concept*, 12 *NATURE & RESOURCES* 3 (1986).

⁸¹ *Biodiversity Challenge*, *supra* note 16, at 12; See also *How Are Biosphere Reserves Organized*, *supra* note 75; *Seville Strategy*, *supra* note 8, at 3.

owned land, but can include privately owned or non-governmental organization owned areas.⁸²

The buffer zone or zones, surrounding the core areas, are reserved for activities occurring in direct relation to conservation efforts, such as research, education, or nondestructive recreation, tourism, or resource use.⁸³ Activities arranged here do not hinder the conservation objectives, but rather assist them.⁸⁴ Buffer zones can contain areas for experimentation in managing natural vegetation, enhancing quality production while conserving natural processes and biodiversity, or rehabilitating degraded areas.⁸⁵ Land in the buffer zone is often privately owned or owned by local government.⁸⁶

The transition areas are flexible in use and allow for promotion of resource management, community cooperation and education.⁸⁷ Local communities, conservation agencies, private enterprises and individual stakeholders agree to work together in transition areas to manage and sustainably develop the area's resources for the benefit of the people who live there.⁸⁸ The transition area is of great economic and social significance for

⁸² *Seville Strategy*, *supra* note 8, at 3-4. *See also What Is a Biosphere Reserve*, *supra* note 41; Price, *supra* note 73, at 647; Fletcher, *supra* note 16, at CRS-3; *Biodiversity Challenge*, *supra* note 16, at 12.

⁸³ *Fact File*, *supra* note 44, at 36; *Seville Strategy*, *supra* note 8, at 3-4; *What Is a Biosphere Reserve*, *supra* note 41; Fletcher, *supra* note 16, at CRS-3; *Biodiversity Challenge*, *supra* note 16, at 12.

⁸⁴ *Seville Strategy*, *supra* note 8, at 3-4; *See also How Are Biosphere Reserves Organized*, *supra* note 75; Fletcher, *supra* note 16, at CRS-3; *Biodiversity Challenge*, *supra* note 16, at 12; *Fact File*, *supra* note 44, at 36.

⁸⁵ *Seville Strategy*, *supra* note 8, at 3-4; *See also What Is a Biosphere Reserve*, *supra* note 41; Price, *supra* note 73, at 647; Fletcher, *supra* note 16, at CRS-3; *Biodiversity Challenge*, *supra* note 16, at 12.

⁸⁶ *Seville Strategy*, *supra* note 8, at 4.

⁸⁷ *Biodiversity Challenge*, *supra* note 16, at 12. *See also Seville Strategy*, *supra* note 8, at 3, 4; *What Is a Biosphere Reserve*, *supra* note 41; Price, *supra* note 73, at 647; Fletcher, *supra* note 16, at CRS-3. *Cf.*, Frost, *supra* note 21, at 213 ("In practice, most British biosphere reserves have a core area based on a national nature reserve or site of special scientific interest and a buffer zone in which farming goes on as usual; none has a transition zone dedicated to developing sustainable resource management practices.").

⁸⁸ *Biodiversity Challenge*, *supra* note 16, at 12. *See also Seville Strategy*, *supra* note 8, at 3-4; *What Is a Biosphere Reserve*, *supra* note 41; Price, *supra* note 73, at 647; Fletcher, *supra*

regional development.⁸⁹ Land in the transition area is most often privately owned, as people may live in these areas.⁹⁰

The mandates and procedures designated by the MAB Program through the initial conference, as well as the Seville Strategy, all work in unison in attempt to reach the goals of the Biosphere Reserve Program. MAB outlines four main goals of the program. The first goal is to utilize biosphere reserves in the effort to conserve natural and cultural diversity, which includes expanding the global network of reserves to improve coverage of global biodiversity, particularly in fragmented habitats and threatened ecosystems, and integrating the concept of biosphere reserves into conservation planning at various government levels.⁹¹ The second goal is to promote biosphere reserves as examples of sustainable development and land management.⁹² This involves obtaining the encouragement of the local community, ensuring that interaction takes place between the core, buffer, and transition areas, and including biosphere reserves in local land-use planning.⁹³ The third goal is to employ biosphere reserves for "research, monitoring, education, and training," comprehending interactions between people and the biosphere, realizing long-term ecosystem monitoring and conservation activities, training people for duties within the biosphere reserves, including scientists and land managers, and improving environmental education, community awareness, and community involvement.⁹⁴ The fourth goal is to thoroughly implement the concept of biosphere reserves, requiring efforts at harmonizing the reserve functions through acceptable planning and management.⁹⁵ The overarching concern of the proffered goals is taking all the necessary steps to strengthen the world network.⁹⁶ These goals necessarily implicate the need for human interaction

note 16, at CRS-3.

⁸⁹ *Id.*

⁹⁰ *Seville Strategy*, *supra* note 8, at 4. *See also Biodiversity Challenge*, *supra* note 16, at 12.

⁹¹ *Seville Strategy*, *supra* note 8, at 5.

⁹² *Id.* at 6.

⁹³ *Id.*

⁹⁴ *Id.*

⁹⁵ *Id.*

⁹⁶ *Id.*

with the reserves. Protecting the environment while improving human well-being through education and development is a central purpose of the program.⁹⁷

E. *How Biosphere Reserves Are Helping*

The Biosphere Reserve was a non-conventional approach created in response to "the enormous variety of cases where specific elements of biological diversity require protection."⁹⁸ As stated above, the goals of the MAB Program include consideration of conservation within a broader context inclusive of the human dimension, implementation of national and international research activities and exchange of information, and reconciliation between conflicting uses of and multiple interests in specific land areas.⁹⁹ The Biosphere Reserve Program realizes that biodiversity has a tremendously wide range of values and occurrences, requiring conservation in a great variety of sites and situations.¹⁰⁰ In regions where human existence has had a long and destructive impact, many important elements of extremely valuable biodiversity still exist.¹⁰¹ Biosphere Reserves seek to maintain these landscapes and improve these ecosystems for future generations, as they are essential for the survival of the human species. Ecosystems perform tasks including producing oxygen and fixing carbon in our atmosphere, keeping soil fertile and limiting its exposure to erosive agents, replenishing aquifers and filtering water, as well as providing pollination and anti-parasite agents and many other tasks.¹⁰²

⁹⁷ See *Fact File*, *supra* note 44, at 36.

⁹⁸ *Biodiversity Challenge*, *supra* note 16, at 10.

⁹⁹ *Id.*

¹⁰⁰ *Id.* at 14.

¹⁰¹ *Id.*

¹⁰² Jose Sarukhan, *Ecosystems, Our Unknown Protectors*, UNESCO COURIER, May 2000, at 26. Fixing carbon and making oxygen occur through photosynthesis, in which green plants absorb carbon dioxide and release oxygen. The industrial revolution affected the stability of the atmosphere, to the point that currently, natural ecosystems cannot absorb the three billion metric tons of carbon that build up annually in the atmosphere. Deforestation has become the second leading cause of global warming because of the significant emissions of carbon

IV. THE NEED FOR BIOSPHERE RESERVES IN URBAN AREAS

A. *The State of Urbanization*

We are in the midst of a transition from a world with two billion people in cities to a world with six billion in cities, mostly in developing countries. Over the next two generations, the equivalent of 1,000 great cities will be built in and about existing cities—an average of 20 per year. The challenge facing urban areas and high-density population areas is achieving settlement patterns that make efficient use of land and infrastructure and reduce burdens on material and energy use while providing satisfactory levels of living.¹⁰³

Rural America is disappearing. Population in urban and suburban America has grown throughout the twentieth century, from half of the country's people living in cities in the 1950s, to over seventy-five percent

dioxide and gases such as methane. *Id.*

Protecting and fertilizing soil and storing freshwater are also closely related services:

Ecosystems are veritable 'freshwater factories'. They absorb rainwater and slowly filter it through the soil before draining it toward streams, rivers, lakes and underground aquifers When the vegetal ground cover is degraded, the water cycle is disrupted. Rain strikes the bare earth, washing away huge amounts of nutritional substances. Reservoirs, lakes and rivers silt up and terrible mudslides, such as those that recently ripped through Central America, Mexico and Mozambique, kill thousands of people and cause incalculable damage.

Id. at 26-27.

¹⁰³ William C. Clark, *Sustainable Science for a Sustainable Environment: A Transition Toward Sustainability*, 27 *ECOLOGY L.Q.* 1021, 1061 (2001). The National Research Council's Board on Sustainable Development believes it possible to accommodate a tripling of the urban population over the next two generations in a sustainable manner. "By making use of both increased density and the opportunity to build anew, these cities should meet human needs while reducing their 'ecological footprint' and providing more environmentally friendly engines of development."

urban dwellers by 1990.¹⁰⁴ In the near future, over half the world's population will live in urban areas, and that number will continue to rise until the overwhelming majority of the human population lives in cities.¹⁰⁵ Growth has been primarily in suburban and exurban areas, rather than in city centers.¹⁰⁶ In addition, the regional distribution of the population shifted *en masse* from North and Midwest America to the South and West.¹⁰⁷

Proponents of urban living presume that this country's rural past is unimportant and worthy of neither remembering nor protecting.¹⁰⁸ They go on to presume that humans are intelligent enough to provide all necessary resources to urban areas and to dispose of their wastes forever.¹⁰⁹ Urban dwellers often fail to realize that cities will grow to a point of implosion, arguing instead that metropolitan living fulfills deep human needs, and that we will never return to the rural foundation of our past.¹¹⁰

¹⁰⁴ See Dirk Johnson, *Population Decline in Rural America: A Product of Advances in Technology*, N.Y. TIMES, Sept. 11, 1990, at A20.

¹⁰⁵ David W. Orr, *Our Urban Future?*, ECOLOGIST, Jan.-Feb. 1999, at 12 ("The United States, for example, is overwhelmingly urban and suburban and becoming even more so."). In 1950, almost half of Americans lived in rural areas, but by 1990, less than a quarter of the population inhabited rural areas, and only two percent of Americans lived on farms. *Id.* See also *Urban MAB*, *supra* note 23, at 1 ("Ongoing urbanization trends indicate that more than 50% of the globe's population will live in urban areas by the year 2000.") (citing World Resources 1996-97).

¹⁰⁶ Social Aspects of Sustainable Development in the USA, Agenda 21—Sustainable Development, available at: <http://www.un.org/esa/agenda21/natlinfo/countr/usa/social.htm> (last visited Mar. 17, 2003) [hereinafter Social Aspects].

¹⁰⁷ *Id.* As financial resources become increasingly limited, growth management has become an important concern for urban planners in these high growth areas. Local governments are attempting to control growth while limiting municipal costs, whether by requiring developers to bear the costs of building streets and utilities, or by enacting strict regulations that limit new development both in terms of placement of buildings and in the number of people who may inhabit the buildings. *Id.*

¹⁰⁸ Orr, *supra* note 105.

¹⁰⁹ *Id.*

¹¹⁰ *Id.* ("Urban boosterism masks a wager of sorts that our evolutionary past is of no consequence, our bets do not need to be hedged, and that 'nature does not set booby traps for unwary species,' as biologist Robert Sinsheimer. [sic] once put it.").

B. *The State of Urban Biodiversity*

Urban ecosystems are studied for their impact on biodiversity.¹¹¹ Biodiversity in urban ecosystems exposes city dwellers to the importance of environmental issues in their immediate surroundings and influences citizens' attitudes toward natural ecosystems.¹¹² Urban ecosystems are highly dynamic and can provide examples for the management of biological diversity in other ecosystems, both urban and non-urban.¹¹³

¹¹¹ Jean-Pierre L. Savard et. al., *Biodiversity Concepts and Urban Ecosystems*, 48 LANDSCAPE AND URB. PLAN. 131, 131 ("The association of biodiversity and urban ecosystems has usually concerned the impact of urbanization on biodiversity. However, biodiversity concepts can easily be applied to the urban ecosystem itself."). See also M. WACKERNAGEL & W. REES, OUR ECOLOGICAL FOOTPRINT: REDUCING HUMAN IMPACT ON THE EARTH 29 (1996) ("Thinking about . . . an encapsulated city forces us to consider not only all the ways in which we remain dependant on nature, but also on all the ways we can reduce humankind's negative impact on the systems that sustain us."); Ian Douglas and John Box, *The Changing Relationship Between Cities and Biosphere Reserves, A report prepared for the Urban Forum of the United Kingdom Man and the Biosphere Committee and derived from a workshop held in Manchester in 1994* § 2.1 (May 2000) [hereinafter *Changing Relationship*] ("If ecology is the science which studies the relationships between organisms and their surroundings, the city is an ideal location for ecological investigation.").

¹¹² Savard et al., *supra* note 111, at 131-32 ("However, while the impact of a city on adjacent ecosystems can be significant, much can be learned by applying biodiversity concepts to the urban ecosystem itself.") (citation omitted).

¹¹³ *Id.* at 132. See also O.L. GILBERT, THE ECOLOGY OF URBAN HABITATS (1989); L.W. ADAMS, URBAN WILDLIFE HABITATS: A LANDSCAPE PERSPECTIVE (1994) ("There are multiple sociological, educational, ecological, environmental quality, and scientific reasons for conserving wildlife and wildlife habitat in urban areas Conservation of urban wildlife and habitat helps to maintain biological diversity . . . thus reducing the threat of species' becoming endangered and possibly extinct."); M.J. McDonnell & S.T.A. Pickett, *Ecosystem Structure and Function Along Urban-Rural Gradients: An Unexploited Opportunity for Ecology*, 71 ECOLOGY 1232, 1232-37 (1990) (considering how urbanization can be useful in ecological research); M.J. McDonnell et. al., *The Application of the Ecological Gradient Paradigm to the Study of Urban Effects*, in HUMAN AS COMPONENTS OF ECOSYSTEMS 175, 175-89 (M.J. McDonnell & S.T.A. Pickett eds., 1993) ("Urbanization with its human modification of the landscape and associated environmental degradation, provides a 'new' and unique pattern in which to extend the knowledge gained from other

There are three groups of concerns related to biodiversity in urban ecosystems.¹¹⁴ These groups are summarized as: (1) the impact of the city on neighboring ecosystems; (2) maximizing biodiversity within the city; and (3) minimizing the role of undesirable species within the urban ecosystem.¹¹⁵

Biodiversity studies tend to overlook urban and suburban parks.¹¹⁶ Explanations of this phenomenon are diverse. Biodiversity indicators are a relatively recent phenomenon in ecology research, and perhaps not thoroughly developed, while suburban parks are highly complex, with a multitude of varying habitats.¹¹⁷ Biodiversity is often only a minor goal of the multi-functional aims of urban parks.¹¹⁸ Suburban park managers are often not trained in conservation techniques, focusing instead on recreational or

systems.”).

¹¹⁴ Savard et al., *supra* note 111, at 132.

¹¹⁵ *Id.* (Regarding the third group, “[w]hile species diversity and abundance are often related to the quality of urban life, the overabundance of some species can be at times undesirable.”) (citation omitted). *See also* Adams, *supra* note 113, at 120 (“Either knowingly or unknowingly, humans sometimes create exceptional habitat conditions for certain [undesirable] wildlife species in cities and suburbs.”).

¹¹⁶ Martin Hermy & Johnny Cornelius, *Towards a Monitoring Method and a Number of Multifaceted and Hierarchal Biodiversity Indicators for Urban and Suburban Parks*, 49 *LANDSCAPE AND URB. PLAN.* 149, 150 (2000) (“Until now most studies on biodiversity are concerned with forests or other (semi-) natural habitats.”). *See also* Gilbert, *supra* note 113.

¹¹⁷ Hermy & Cornelius, *supra* note 116. Biodiversity indicators relate to what specific parts of an ecosystem are selected for monitoring to represent a multi-faceted, hierarchical, complex ecosystem. “[G]ood indicators should at least fulfil a number of criteria and should not be focusing on one hierarchy or facet.” *Id.* at 150 (citation omitted). “[H]abitat heterogeneity maybe a good starting base . . . [because it may be] easier to apply. . . [and] perhaps incorporate better some threats to biodiversity, such as fragmentation, habitat loss, habitat change through management . . .” *Id.*

¹¹⁸ *Id.* at 150. In regulating biodiversity in urban and suburban parks,

[b]oth, species and habitat should be clearly defined and measurable in a clear, feasible way. They also should reflect the values and functions the society attaches to (sub)urban parks...this means that [elements] other than [those] strictly natural elements should be incorporated in the development of a biodiversity indicator for (sub)urban parks, at least in so far as they affect biodiversity.

Id.

cultural values.¹¹⁹ With such values in mind, exotic species are often of utmost importance to park development, whereas conservation goals focus on preserving the biological integrity of native plant and animal species.¹²⁰

The cessation of conservation efforts in urban and suburban communities could have disastrous effects for promoting and educating city dwellers on the importance of biodiversity. Biodiversity is a dynamic system, and humans, both urban and rural dwellers, make up an integral part of the system.¹²¹ "Sustainable conservation demands support for a global network of nature reserves involving local people closely in their management."¹²²

The landscapes surrounding urban areas will influence the biodiversity found within the city.¹²³ Urban growth must necessarily consider the development of large recreational areas which may, upon citizen approval, remain as natural as desired.¹²⁴ Such recreational zones must reconcile conflicts between social and ecological endeavors.¹²⁵ "The overall thinking about green spaces, corridors, wildlife and people is common to all cities," but solutions to these conflicts are individual to each city, and depend upon "local, physical, social and ecological constraints."¹²⁶ Creating biosphere reserves that are central components of cities and suburban areas could create an effective solution to these problems, at once conserving biodiversity, reducing urban waste, and educating citizens according to the needs and demands of each individual community.

¹¹⁹ *Id.*

¹²⁰ *Id.*

¹²¹ *Friend, supra* note 4.

¹²² *Id.*

¹²³ Savard, *supra* note 111, at 136.

Urban ecosystems are quite similar worldwide in terms of structure, functions, and constraints. They differ in terms of their geographical location, their size and the type of landscape they modify. The landscape surrounding a city greatly influences plant and wildlife species that will be found within the new artificial ecosystem."

Id.

¹²⁴ *Id.* at 137.

¹²⁵ *Id.*

¹²⁶ *Id.*

V. IMPLEMENTATION OF THE URBAN BIOSPHERE RESERVE

A. *How Biosphere Reserves Could Work in Cities*

With the increase in interest of sustainable development since the Rio conference, and the growing desire of many cities to become "greener," the time is ripe to develop and implement a plan to bring the biosphere reserve to the city. Creating biosphere reserves in urban areas could be one way to actualize goals of sustainable development and teach local people about living sustainable lives, while protecting and enhancing biodiversity in those areas.¹²⁷ Cities do provide "enormous ecological diversity" which serves important functions including reducing heat in the city, reducing pollution, and providing human benefits.¹²⁸ "[Biosphere] reserves in and around urban centres could create significant long-term benefits by bringing people back together with a high-quality natural environment. Working properly, biosphere reserves could become less a designation, and more a way of life."¹²⁹

Creation of urban biosphere reserves will not be an easy task. Much flexibility will be needed, and perhaps adaptation of biosphere criteria and objectives of the Seville Strategy, in order to apply the biosphere concept to densely inhabited areas.¹³⁰ "[T]he vision needs to be broad" and widely embraced by the local community.¹³¹ Simply urging people to embrace the sustainable ideas that a urban biosphere reserve would bring is inadequate; there must be some benefit bestowed upon the community because of the designation.¹³² This benefit can range from economic (e.g., increased property values or increased revenues from tourism), to recreational (enjoyment of the buffer and transition areas), to improved quality of life (by accessibility to

¹²⁷ *Changing Relationship*, *supra* note 111, executive summary.

¹²⁸ *Id.*

¹²⁹ Frost, *supra* note 21.

¹³⁰ *Changing Relationship*, *supra* note 111, executive summary.

¹³¹ *Id.*

¹³² *Id.*

natural landscapes or lower pollution levels with an increase of plant life and trees).¹³³ The “new philosophy” of greener cities should be embraced and utilized by the MAB Program as an opportunity to implement the biosphere reserve in urban areas.¹³⁴ The urban biosphere reserve could exist in several different ways, depending on geography, feasibility, local support, and local government.

The most idealistic scenario is the concept of biosphere reserve as city.¹³⁵ While such a lofty idea may never be truly realized, the conceptions and ideas that would involve such a collaboration may be separated and applied to existing urban areas to create other more likely scenarios.

The city as biosphere reserve would exist as an urban area containing and maintaining each zone, core, buffer, and transition within the borders of the city itself. These areas would then provide a habitat for and manage a significant and representative range of ecosystems.¹³⁶ Large unoccupied spaces need not be available. The cluster reserve concept could be applied, theoretically, by overlaying the biosphere zoning criteria onto a growing city, finding core and buffer zones in undeveloped land, and allowing for

¹³³ *Id.* “For all the people involved, particularly the local people, there has to be some added value, be it in terms of enhanced economic activity, or improved quality of life, or personal enjoyment.”

¹³⁴ *Id.* § 2.5.

A new philosophy of the value of natural areas in cities is spreading and proposals that there should be an opportunity for experience of a natural environment within walking distance of every child’s home are gaining currency. These trends suggest that the concept of Biosphere Reserves should be extended to enable parts of urban areas to form either local Biosphere Reserves or to be part of a cluster Biosphere Reserve.

Id. (citation omitted).

¹³⁵ *Urban MAB*, *supra* note 23.

It is one thing to apply the biosphere reserve concept outside a city as a green belt. It would be much more ambitious to suggest that a city itself (particularly a city of any more important size) could be an integrated part of a biosphere reserve (ie include extensive core areas) or actually constitute the biosphere reserve.

Id.

¹³⁶ *Id.* para. 15.

habitation and development in transition areas.¹³⁷ By delineating areas and providing for the protection and management of ecosystems, such a city would most likely meet the criteria of the Statutory Framework and mesh with the goals and objectives of the Seville Strategy.¹³⁸

Another idea for the collaboration of biosphere reserves and urban areas is a green belt biosphere reserve around a city.¹³⁹ A green belt biosphere reserve would aid in developing sustainable practices for polluted cities.¹⁴⁰ Core or buffer zones already existing within the city itself would be minor, if they exist at all.¹⁴¹ It is possible that some cities would meet the criteria for the transition zone.¹⁴² The biosphere reserve would include land outside the city borders, yet meet objectives that focus on sustaining the urban areas.¹⁴³

Blending these two models provides the concept of a mixture of the urban biosphere reserve and the green belt reserve.¹⁴⁴ Environmentally conscious cities already typically include significant areas for conservation within their borders.¹⁴⁵ These protected lands could be designated as core areas, and when managed with more traditional core areas with truly minimal human interaction in the natural ecosystems in lands surrounding the urban centers, could be combined as "green corridors."¹⁴⁶ Many cities already contain what could be designated biosphere reserve zones through the

¹³⁷ See *Changing Relationship*, *supra* note 111, § 2.4.5.

¹³⁸ See *id.* § 2.5 ("The establishment and strengthening of Biosphere Reserves where there are critical interactions between people and their environments (eg peri-urban areas) is provided for under Goal II of the 'Seville Strategy' for the future development of Biosphere Reserves.") (citation omitted). See also *Urban MAB*, *supra* note 23; Frost, *supra* note 21, at 214 ("Such reserves could create significant long-term benefits for wildlife . . . not because of any protection conferred by the designation, but because they can be used as testing grounds for the reintegration of people with the natural environment.").

¹³⁹ *Urban MAB*, *supra* note 23, para. 16.

¹⁴⁰ *Id.*

¹⁴¹ *Id.*

¹⁴² *Id.*

¹⁴³ *Id.*

¹⁴⁴ *Id.*

¹⁴⁵ *Urban MAB*, *supra* note 23.

¹⁴⁶ *Id.*

transition from urban, to suburban, to rural landscape.¹⁴⁷ Combining the “green corridors” with the already existing transition of land use, biodiversity, and population density, “[a]ll such elements [could] have their place in an Urban Biosphere Reserve System.”¹⁴⁸

Stressed by over-development and great losses to biodiversity, the United Kingdom MAB (“UK MAB”) has considered these ideas at length, primarily through its Urban Forum, created in 1987.¹⁴⁹ The mission of the group is to “raise awareness, stimulate research, influence policy, improve the design and management of urban systems, [and] push urban nature conservation up the social and political agenda.”¹⁵⁰ The Urban Forum’s work includes:

- Initiating and reviewing key areas of research, especially ecology, human ecology, and social sciences applied to urban areas.
- Generating new concepts and reviewing existing ones in the field of urban ecology in its widest sense, including, for example, social sciences, planning, urban design and the dynamics of human communities.
- Preparing and commenting on papers dealing with urban ecology and biodiversity issues.
- Assisting statutory agencies in assessing the needs for nature conservation in and around towns and cities.¹⁵¹

¹⁴⁷ *Changing Relationship*, *supra* note 111, § 7.

¹⁴⁸ *See id.* (“In many urban areas the transition between built-up zone and natural areas is irregular with a zone of farming or modified landscape often forming a transition, such as the areas of sheep-grazing intervening between mining towns and the high mountains in many central European areas.”).

¹⁴⁹ *About the Urban Forum*, at <http://www.ukmaburbanforum.org.uk/about.htm> (last visited Mar. 17, 2003).

¹⁵⁰ *Id.* *See also UK MAB Urban Forum Annual Report 2001/2 and Work Programme 2002/3*, at <http://www.ukmaburbanforum.org.uk/work.htm> (last visited Mar. 17, 2003) (reiterating the same goals).

¹⁵¹ *UK MAB Urban Forum Annual Report 2001/02 and Work Programme 2002/03*, at

The Urban Forum realizes that extending the concepts of biosphere reserves to urban areas will require a shared vision with many aspects of city life. Not only will the ecological areas need protection and monitoring, but a joint effort will be necessary from the local government and from the community as a whole.

The model Urban Biosphere Reserve would be created by and with the support of local communities and landowners.¹⁵² The reserve would have multiple core areas in and around the city.¹⁵³ Local parks, preserves, and natural areas could be utilized as buffer zones.¹⁵⁴ The model would include elements of the city's open spaces as transition areas, including "informal open space, industrial landscaping schemes, transport corridors, elements of the urban forest, and private open space."¹⁵⁵ The reserve would run under a management plan that incorporated the various local and community plans across administrative boundaries, while maintaining landowner participation.¹⁵⁶ "A sense of possession and ownership in a project leads not only to local pride but to stronger local pressure on all levels of government."¹⁵⁷ The reserve would provide opportunities to perform outreach educational programming to bring the entire local community into contact with the reserves, which is becoming a reality in some existing biosphere locations. Many reserves are still realizing a decline in biodiversity due to the effects of encroaching urban environments. The Everglades National Park and Biosphere Reserve, for example, "may be on the verge of collapse."¹⁵⁸ Growth in population and tourism, along with a change in regulation of water for agricultural and flood control purposes has caused the Everglades to be

<http://www.ukmaburbanforum.org.uk/work.htm> (last visted Mar. 17, 2003).

¹⁵² Frost, *supra* note 21, at 215.

¹⁵³ *Id.*

¹⁵⁴ *Id.*

¹⁵⁵ *Id.*

¹⁵⁶ *Id.*

¹⁵⁷ *Changing Relationships*, *supra* note 111, executive summary.

¹⁵⁸ *Id.* § 3.1 (quoting E.C. Spiker et al., *South Florida Ecosystems Studies—Geochemical History of Ecosystem Conditions and Variability*, U.S. Geological Survey Circular 1108, 82-94 (1995)).

“too wet in the wet season and too dry in the dry season.”¹⁵⁹ Effects on plant and animal species have been dramatic, with commonly found species now near extinction, and previously rare species dominating.¹⁶⁰

Similarly, the Tatra Mountains National Park, part of the international Polish-Slovakian Biosphere Reserve, is experiencing ecological difficulties as disagreements between local governing authorities and local citizens increase.¹⁶¹ Population growth and an increase in tourism have led to development up the base of the mountain by private land owners, threatening to break the reserve up into “a series of island refuges.”¹⁶² Local government has put strong pressure on the national park authority to increase sport and recreation facilities in the buffer zone.¹⁶³ Pollution from industry, tourism, and heating has contributed to severe deforestation.¹⁶⁴ Similarly, sheep grazing, a traditional cultural activity, has damaged the forests and contributed to erosion of the slopes in the mountain meadows.¹⁶⁵ The Biosphere Reserve has been effective in negotiating compromises between nature, economy, and the cultural traditions of the area by permitting recreation and sheep grazing in transition areas.

The Everglades and the Tantras may be extreme examples of urban encroachment without proper mechanisms to protect the environment. These examples, however, demonstrate the importance of balancing the needs of nature with the needs of humanity. While the co-existence of man and nature in these two situations seems tenuous at best, many other cities are finding benefits in attempting to integrate ideas of sustainable development into city planning. These cities offer prime examples of how well biosphere reserves could coexist with urban areas.

In the United States, programs such as Chicago Wilderness (Chicago Region Biodiversity Council) are studying ecosystems now in the hope of

¹⁵⁹ *Id.* § 3.1.

¹⁶⁰ *Id.*

¹⁶¹ *Id.* § 3.2.

¹⁶² *Id.*

¹⁶³ *Id.*

¹⁶⁴ *Changing Relationships*, *supra* note 111 § 3.2.

¹⁶⁵ *Id.*

protecting them in the future.¹⁶⁶ There are over 150 projects initiated by Chicago Wilderness including eighteen related to ecological restoration, eight concerning planning and policy, eleven information management projects, twenty one dealing with ecological inventories and monitoring, and thirty-three public participation and outreach projects.¹⁶⁷ Other cities have taken the idea of Chicago Wilderness and are preparing their own biodiversity recovery plans.¹⁶⁸ These urban areas include New York, Philadelphia, San Antonio and Miami.¹⁶⁹

In Europe, action has already begun to study the possibility and impacts of biosphere reserves in urban areas. MAB Project 11 ("MAB Rome Project") was started in the 1970s and continued into the 1990s.¹⁷⁰ Various research groups developed the program and produced significant data on the biological and landscape aspects of Rome, as well as the social and human aspects of the city.¹⁷¹ The research culminated in a proposal to create a biosphere reserve in the green areas of Rome, which would further the original MAB Rome Project, increasing awareness and fostering relationships between the community and environmental decision makers.¹⁷²

¹⁶⁶ Chicago Wilderness: A Regional Nature Reserve, at <http://www.chicagowilderness.org/summary.html> (last visited Apr. 1, 2003).

¹⁶⁷ See Ruth Eckdish Knack, *Outstanding Planning: Chicago Wilderness's Biodiversity Recovery Plan*, PLANNING (March 2001), available at <http://www.planning.org/planningpractice/2001/mar01-04.htm> (last visited Apr. 1, 2003); Chicago Wilderness, *Bringing Forestry to People Through Collaborative Stewardship*, Report of the USDA Forest Service, Northeastern Area, available at <http://www.na.fs.fed.us/briefs/wilderness99/wilderness99.pdf> (last visited Apr. 1, 2003). See also Northeastern Illinois Planning Commission, *Chicago Wilderness Biodiversity Recovery Plan Wins National Recognition*, News Release (March 15, 2001), available at http://www.nipc.cog.il.us/bioplan_award_news.htm.

¹⁶⁸ Knack, *supra* note 167.

¹⁶⁹ *Id.* (Additionally, foreign countries including Brazil, Japan, and Germany have inquired into the program in hopes of creating their own biodiversity recovery plans).

¹⁷⁰ Bonnes et al., *supra* note 77.

¹⁷¹ *Id.*

¹⁷² *Id.*

B. *Creating Opportunity for Community Involvement*

Environmentalists and urban dwellers of racial minorities are moving into an unavoidable relationship with each other because environmental concerns are of great significance to urban and minority communities, while environmentalists have broadened their focus to include urban areas.¹⁷³ If a local community is excluded from the political process of creating a conservation area, the local citizens may “become hostile” to the ideas of conservation of and exclusion from areas traditionally inhabited.¹⁷⁴

The process of environmental decision making needs to become more accessible to the individual, provide more citizen understanding, be as democratic and informative as possible, and provide open access to environmental negotiations involving the community.¹⁷⁵ Programs could be

¹⁷³ Robert W. Collin & Robin Morris Collin, *Sustainability and Environmental Justice: Is the Future Clean and Black?*, 31 ENVTL. REP. 10,968 (Aug. 2001) (“Both constituencies now recognize that the common concern that must unite . . . environmentalists and urban dwellers is sustainable use of resources and equitable treatment of people.”). See also Robert Collin et al., *Environmental Racism: A Challenge to Community Development*, 25 J. BLACK STUD. 355, 369 (1996) (“[B]ecause ethnic differences can affect the preference for natural settings, increased citizen participation can assist designers not familiar with the neighborhood.”); UNEQUAL PROTECTION: ENVIRONMENTAL JUSTICE AND COMMUNITIES OF COLOR (Robert Bullard ed., 1994); CONFRONTING ENVIRONMENTAL RACISM: VOICES FROM THE GRASSROOTS (Robert Bullard ed., 1993); U.S. EPA, 1 REDUCING RISK FOR ALL COMMUNITIES: WORKGROUP REPORT TO THE ADMINISTRATOR 2 (1992) (“The Workgroup was directed to assess the evidence that racial minority and low income communities bear a higher environmental risk burden than the general population.”).

¹⁷⁴ *Biodiversity Challenge*, *supra* note 16, at 9.

Situations like these have arisen when governmental or colonial authorities have failed to consider the impact of national parks on the traditional activities of indigenous peoples and their livestock and did not offer them appropriate benefits or compensation. Recent experience in Africa and the former Soviet Union shows that when protected areas are imposed upon local populations in this way, they collapse easily as a result of human encroachment, poaching, deforestation—whenever a social or political crisis occurs.

Id.

¹⁷⁵ See Poirer, *supra* note 17, at 80-81 (“Attention to the ongoing process is important not

developed within biosphere reserves to encourage participation of local people, including developing new initiatives, such as innovative social mechanisms that would tie local citizens to the success of the reserve.¹⁷⁶ Models for urban biosphere reserves are of the huge scale implied by the Seville Strategy, and would necessarily involve social as well as natural scientists for proper management.¹⁷⁷

only because of immediate results, but because the process choices and results now will shape the future ability to engage and negotiate"). See also Gregory S. Alexander, *Takings and the Post-Modern Dialectic of Property*, 9 CONST. COMMENTARY 259, 277 (1992) ("Such a method [of resolving takings conflicts] must, in other words, be as open and democratic as possible."); Richard J. Lazarus, *Debunking Environmental Feudalism: Promoting the Individual through the Collective Pursuit of Environmental Quality*, 77 IOWA L. REV. 1739, 1771-73 (1992) ("The challenge is to establish a system of government that promotes environmental protection in a manner that fosters individual rights by not excluding individuals from the decision making process."); Joseph L. Sax, *Takings Legislation: Where It Stands and What is Next*, 23 ECOLOGY L.Q. 509, 519 (1996) ("[T]he best way to solve the problems of small owners is not to give them more opportunities to go to some complex administrative or judicial process, but to try to find ways to lift undue regulatory burdens from these people."); Jonathan Poisner, *A Civic Republican Perspective on the National Environmental Policy Act's Process for Citizen Participation*, 26 ENVTL. L. 53, 94 (1996) ("[T]he goal is to create structures that take citizens out of the role of advocate, or passive bystander, and place them in the role of decision maker."); Rena I. Steinzor, *Regulating Reinvention and Project XL: Does the Emperor Have Any Clothes?*, 26 ENVTL. L. REP. (Envtl. L. Inst.) 10,527, 10,533-35 (1996) ("[T]here is the difficult and controversial issue of giving local community groups, municipal officials, labor representatives, public health experts, and environmentalists the right to veto—and not just vote on—a project."); Adam N. Bram, Note and Comment, *Public Participation Provisions Need Not Contribute to Environmental Injustice*, 5 TEMP. POL. & CIV. RTS. L. REV. 145, 167 (1996) ("Although lay citizens, especially those of low-income/racial minority communities, bear the brunt of environmental problems, they lack meaningful ways to influence the decision making process More meaningful public participation in decision-making processes will not delay important agency decisions, but an absence of opportunities for meaningful participation guarantees public dissatisfaction and encourages confrontation.").

¹⁷⁶ See *Biodiversity Challenge*, *supra* note 16, at 32 ("Such initiatives could include agroforestry, watershed management, or renewable energies as well as innovative social or financial mechanisms.").

¹⁷⁷ Frost, *supra* note 21.

C. *Creating Opportunities for Urban Education*

Enhancement of biodiversity in urban ecosystems can have a significant and positive effect on the quality of life for the growing urban population, and through increased education and enjoyment, can increase the conservation of biodiversity in natural ecosystems.¹⁷⁸ Preservation of biological diversity will depend on having a significant population subsist on it, as opposed to merely having a small, but educated group of supporters vaguely aware of the importance of biodiversity, yet with little idea of its specific effects.¹⁷⁹ The knowledge necessary to understand the importance of ecosystems and their duties to the surrounding environment is developed through long term observation of and collaboration with the environment in which one lives and works.¹⁸⁰ Urban landscapes will have to contain more types of biodiversity with more biologically diverse landscapes.¹⁸¹ The critical question is who will teach future generations to respect, conserve, and protect biodiversity.¹⁸²

The President's Council for Sustainable Development ("PCSD") Task Force on Public Linkage, Dialogue and Education advocates that "an educated public is our most powerful resource to meet the challenges created by increasing environmental, economic and social demands."¹⁸³ The Task Force was created by the PCSD to provide public accessibility to the actions

¹⁷⁸ Savard, *supra* note 111, at 139 ("Urban ecosystems can be of high value to a variety of . . . organisms or to several other aspects of biodiversity . . . No other ecosystems support such high densities of people so that desires and perceptions of urban residents must form an integral part of biodiversity management in urban ecosystems.").

¹⁷⁹ Orr, *supra* note 105, at 2.

¹⁸⁰ *Id.* (arguing that this knowledge "enhances biodiversity and promotes 'integrity, stability, and beauty' in working landscapes . . . that comes from affection for a particular place, the necessity to earn a living from it, and the understanding that biological diversity enhances the living in the fullest sense of the word").

¹⁸¹ *Id.*

¹⁸² *Id.* at 14.

¹⁸³ *Social Aspects*, *supra* note 106. The PCSD was created by President Clinton as a federal advisory committee to guide in reaching the national goals related to sustainable development. President's Council for Sustainable Development, at <http://clinton2.nara.gov/PCSD/Overview/index.html> (last visited Apr. 1, 2003).

of the Council, to increase opportunity for notice, review and comment, and to encourage public education.¹⁸⁴ The Public Linkage Task Force promotes communication between the PCSD and local communities, as well as informing the public of the council's activities and educating about sustainable development.¹⁸⁵ "Through its efforts, the Task Force hopes to foster national understanding of sustainable development."¹⁸⁶

VI. AGAINST THE URBAN BIOSPHERE RESERVE

While implementing biosphere reserves in urban and suburban areas seems an idealistic solution to the growing problems of conservation and sustainability, there are several arguments against the idea that hold merit. First, there may be difficulty in recognizing urban areas within the Statutory Framework and Seville Strategy of the World Network of Biosphere Reserves.¹⁸⁷ Second, the traditional approach of biosphere reserve designation is association with national parks, or previously protected areas with minimal human involvement.¹⁸⁸ Last, federal legislation could severely curtail even the possibility of developing reserves that include privately owned land, or federal land adjacent to non-federal land.¹⁸⁹

A. *Urban Areas Are Not Recognized by the Statutory Framework*

The core area and buffer zone criteria required by the Statutory Framework will be difficult to meet in an urban landscape.¹⁹⁰ It may be too ambitious at this point in the global journey toward sustainability to suggest that an urban area "could be an integrated part of a biosphere reserve."¹⁹¹ The Seville Strategy does not recognize cities (beyond mention of suburban

¹⁸⁴ *See id.*

¹⁸⁵ *Id.*

¹⁸⁶ *Id.*

¹⁸⁷ *Urban MAB, supra* note 23, at 3.

¹⁸⁸ *See id.*

¹⁸⁹ *See* H.R. 883, 107th Congress (2001).

¹⁹⁰ *Urban MAB, supra* note 23.

¹⁹¹ *Id.*

areas).¹⁹² Cities are mentioned as potential reserve areas in the Statutory Framework of the World Network of Biosphere Reserves.¹⁹³ The Statutory Framework mandates low human impact, particularly in the core and buffer areas.¹⁹⁴ Even if areas could be established to meet the requirements of the core and buffer areas, maintaining secured access to the areas, not to mention securing the necessary community support, could be extremely difficult in an environment where people have traditionally and habitually lived, worked, and played.

B. *Non-Traditional Designation*

The traditional designation of biosphere reserves has been in areas where there is little to no human interaction with the environment.¹⁹⁵ To change this procedure could result in confusion "as to the objectives and nature of biosphere reserves" if the World Network consisted of major urban areas.¹⁹⁶ At the Seville Conference, amidst favorable consideration by some participants, others voiced concern over a change in the association of reserves with the more traditionally natural areas.¹⁹⁷

C. *American Land Sovereignty Act*

The United States federal government has also voiced concern over the protocol of biosphere reserves generally, and any effects that designation may have on the reserves encroaching upon privately-owned land. The American Land Sovereignty Act was introduced in the 107th Congress to nullify any designation of a biosphere reserve under the MAB Program unless specifically authorized by federal law.¹⁹⁸ The Act also would require that all

¹⁹² *Id.*

¹⁹³ *Id.*

¹⁹⁴ *Id.*

¹⁹⁵ *Id.*

¹⁹⁶ *Urban MAB*, *supra* note 23.

¹⁹⁷ *Id.*

¹⁹⁸ See H.R. 883, 107th Congress (2001).

biosphere reserves consist of federally owned lands and not restrict any adjacent privately held land as a result of the designation.¹⁹⁹

The MAB Program is an independent national committee, therefore it has no legislative directives or authorization from Congress. The Act was proposed to protect the sovereignty of Congress and the states over international agreements concerning land use.²⁰⁰ There is concern that private interests are not protected from diminishment as a result of federal actions designating land for the purpose of restricting its use.²⁰¹ Certainly, any privately owned land that bordered a federally mandated, MAB protected buffer, or possibly core, area would be subject to restrictions. The property issue is a large hurdle to jump. While private property interests are one of the fundamental rights of the constitution, regulation of private land is increasingly permitted for environmental protection. Introducing biosphere reserves in any populated area would need to be preceded by extensive education and support from the local community. It would be especially important to secure the understanding of those landowners who may face restriction and regulation.

D. *Property Rights Issues*

Too often private property and environmental arguments are the equivalent of preaching to the converted. To be sure, preaching to the converted has its uses. It is a time-honored fundraising tactic. It can also mobilize votes and other kinds of political pressure; and can justify the continued existence of public interest advocates of whatever stripe. But if we are trying to resolve a particular kind of resource dispute productively, then it may be necessary to ease up. In the area

¹⁹⁹ *Id.*

²⁰⁰ *Id.*

²⁰¹ Fletcher, *supra* note 16, at CRS-2 (“[C]oncerns have been raised about the connection of [the MAB] program to the United Nations, and the belief that the United Nations might attempt to exercise control over U.S. lands.”).

of natural resources and land use, as elsewhere, communication can be facilitated by a willingness to identify and engage cultural and communicative boundaries—in a broad sense, to negotiate.²⁰²

Ownership arrangements are often unique to the biosphere designation.²⁰³ The core areas of biosphere reserves are most often public land, usually pre-existing national parks, but may be owned by private individuals, or belong to private nongovernmental organizations.²⁰⁴ The buffer zone is often privately or locally owned, as is the transition area.²⁰⁵ Enhancement and conservation of urban ecosystems can also positively affect the local economy “as residential properties adjacent to greenways or urban parks have a higher market value than similar non-adjacent properties.”²⁰⁶ While a strong federal presence may be the preferred method of creating new conservation policies, a comprehensive federal biodiversity policy would

²⁰² Poirer, *supra* note 17, at 68-69.

²⁰³ Price, *supra* note 73, at 645 (“[T]he land and water [biosphere reserves] contain is administered and managed by more than one agency or owner.”); *Seville Strategy*, *supra* note 8, at 3-4; *What Is a Biosphere Reserve*, *supra* note 41. See *Biodiversity Challenge*, *supra* note 16, at 12 (“[E]very site is specific and local conditions around the world are extremely diverse.”).

²⁰⁴ *Seville Strategy*, *supra* note 8, at 3-4 (“A large number of biosphere reserves simultaneously belong to other national systems of protected areas.”); *What Is a Biosphere Reserve*, *supra* note 41; Fletcher, *supra* note 16, at CRS-3 (“[W]ithin the United States, all of the land within the reserve is generally federal property.”). See *Biodiversity Challenge*, *supra* note 16, at 12 (“territorial components . . . may combine public land with private land.”).

²⁰⁵ *Seville Strategy*, *supra* note 8, at 2. See also *What Is a Biosphere Reserve*, *supra* note 41.

²⁰⁶ Savard et al., *supra* note 111, at 139; Melvin R. Levin, *Planning with Nature: Alternative Approaches*, in *INTEGRATING MAN & NATURE IN THE METROPOLITAN ENVIRONMENT 9* (Lowell Adams & Daniel Leedy eds., 1987) (“[T]he growing sophistication and awareness on the part of developers and purchasers that attractive natural features are indeed marketable . . . [has] influenced attitudes to nature regarding urbanization.”); Chris Gordon & Peter Shirley, *All Things to All People: Parks and Semi-Natural Open Spaces in 21st Century Britain*, UK MAB FORUM MAY 2002 (“[P]arks contribute to the attractiveness of the location which is reflected in land values and is one element of urban regeneration.”).

raise concerns over the traditional understanding that land use decisions must be local in nature.²⁰⁷

Comprehensive sustainable development policies, including management of biosphere reserves, may be achieved in part by local administration. The United States Agency for International Development ("USAID"), the federal agency responsible for providing United States economic and humanitarian assistance worldwide, encourages ideas of sustainable development reliant on local management.²⁰⁸ These ideas include:

- permitting local governments to implement environmental improvements by decentralizing and empowering local municipalities;
- creating financial, institutional, and legal programs which encourage independent local governments and increase involvement of the private sector in administration of urban services, including housing, utilities, and improved environmental management; and,
- increasing popular participation in local government decisions, particularly with regard to urban services.²⁰⁹

²⁰⁷ See Bradley C. Karkkainen, *supra* note 28, at 8

There can be little doubt that any significant new effort to conserve biological resources will require a strong federal role. Yet it is equally certain that major federal initiatives in this area will be controversial. Land use is traditionally a matter of state and local concern, and an expanded federal role in this field will raise serious federalism concerns.

Id.

²⁰⁸ See Press Release, United States Agency for International Development, USAID Brings Best Practices to Habitat II (May 23, 1996), *available at*: <http://www.usaid.gov/press/releases/960520.htm>. The goals of USAID reflect ideas of sustainable development decided upon at Habitat II. Habitat II was the second UN conference on human settlement. Held in Istanbul in 1996, the conference focused on urban sustainable development.

²⁰⁹ *Social Aspects*, *supra* note 106, at *Human Settlements*.

Cities make essential contributions to social and economic development, not only at local levels, but at national levels as well.²¹⁰ Environmentalism could find a new following by appealing to local communities.²¹¹ Some of the staunchest “pro-environmental rhetoric” may have to be toned down and some control over conservation and sustainable development be released to local authority.²¹² Compromises between hard-core environmentalists and local citizens could be negotiated with the result of satisfying both sides.²¹³ Ultimately, “the future of environmentalism lies in its acknowledging and developing a rhetoric around its own central importance to local community.”²¹⁴

VII. CHOOSING THE BIOSPHERE RESERVE

At the Seville conference in 1995, a vision for the future of biosphere reserves was discussed, developing biosphere reserves into “theaters for reconciling people and nature.”²¹⁵ Proponents argued that biosphere reserves can “bring knowledge of the past to the needs of the future, they can demonstrate how to overcome the sectoral nature of our institutions, . . . [and provide] a means for the people who live and work within and around them to attain a balanced relationship with the natural world.”²¹⁶ The Seville

²¹⁰ New approaches to government and sustainable urban management are being created at the local level. See U.N. CENTRE FOR HUMAN SETTLEMENTS (HABITAT), *SUSTAINABLE CITIES AND LOCAL GOVERNANCE* (Nov. 2000), available at <http://www.unhabitat.org/programmes/sustainablecities/documents/locgoveng2k.pdf> (“Cities also increasingly have in common a firm understanding that solutions to their environmental problems, in order to be effective and sustainable, cannot depend upon external or central government support but must rely upon local technical and financial resources.”).

²¹¹ Poirer, *supra* note 17, at 85.

²¹² *Id.*

²¹³ *Id.*

²¹⁴ *Id.*

²¹⁵ *Biodiversity Challenge*, *supra* note 16, at 13. See generally *Seville Strategy*, *supra* note 8.

²¹⁶ UNESCO, *The Vision from Seville for the 21st Century, The Seville Strategy for the World Network of Biosphere Reserves* (1996), available at <http://www.unesco.org/>

Strategy created a broader vision for biosphere reserves in the twenty-first century, as places promoting long term monitoring, researching, training of specialists and managers, and "education and the promoting of public awareness," while providing opportunity for local communities to become fully involved in realizing plans for conservation and sustainable development.²¹⁷

Biosphere reserves bordering on or including urban areas could create "significant long-term benefits" for biodiversity as the reserves could be "used as testing grounds for the reintegration of people with the natural environment."²¹⁸ Globally, nationally, and locally, sustainable development ideas are being studied and developed in various degrees.²¹⁹ Biosphere reserves near or in urban areas could provide opportunity for unification of management regimes and scientific standards, offering a baseline monitoring method for which to study urban ecosystems and implement sustainable development ideas.²²⁰

Biodiversity is dynamic, and humans are a part of that continuum, capable of sustaining biodiversity, and even an essential part in "co-evolution between indigenous populations and their natural environment."²²¹ Managing natural resources is an "ongoing cultural dialogue and debate" over which resource management mechanisms are appropriate in different communities at different points of development or degradation.²²² A "new wave of

mab/docs/stry-4.htm, quoted in *Biodiversity Challenge*, *supra* note 16, at 13. See generally *Seville Strategy*, *supra* note 8.

²¹⁷ Frost, *supra* note 21, at 213.

²¹⁸ *Id.* at 214. See generally *Urban MAB*, *supra* note 23.

²¹⁹ Clark, *supra* note 103, at 1066. See also BOARD ON SUSTAINABLE DEVELOPMENT, NATIONAL RESEARCH COUNCIL, *OUR COMMON JOURNEY: A TRANSITION TOWARD SUSTAINABILITY* 296 (National Academy Press) (1996) [hereinafter *OUR COMMON JOURNEY*].

²²⁰ Clark, *supra* note 103, at 1066.

²²¹ Larrere, *supra* note 12, at 17 ("The principle of the 'sustainable management' of biodiversity springs from this necessary partnership between human beings and nature.").

²²² Poirer, *supra* note 17, at 59. See, e.g., Bruce A. Ackerman and Richard B. Stewart, *Reforming Environmental Law*, 37 STAN. L. REV. 1333, 1365 (1985) ("Rather than wringing our hands helplessly before [the] complexities, the challenge is to incorporate maturing perceptions about our regulatory problems into the evolving legal structure."); Howard Latin,

environmentalism" is focusing on what environmental conservation strategy will work for which type of land, and the negotiation over use of private property is a big part of that discussion.²²³ Because land ownership varies within a biosphere reserve, reserves surrounding urban areas in various countries could test different regulatory schemes and focus on different methods of educating the public and landowners of balancing ownership rights with conservation and sustainability.

VIII. CONCLUSION

Creating urban biosphere reserves will not be an easy task, but if we are to live sustainably, it will be a necessary task. Local communities should be educated on the benefits of conservation and sustainability generally, as well as biosphere reserves specifically. Citizens could then "be encouraged to nominate potential locations" within their communities.²²⁴ Designation of biosphere reserve areas needs to be promoted as an opportunity for urban and suburban neighborhoods.²²⁵ "The overall goal of any new reserve must be to conserve nature by reconnecting people to it and helping them learn more about it, and so contribute to managing it in a sustainable way."²²⁶ The Biosphere Reserve concept could be adapted for application in urban areas, maintaining the criteria, regulations, and goals of the MAB Program.

Ideal Versus Real Regulatory Efficiency: Implementation of Uniform Standards and "Fine-Tuning" Regulatory Reforms, 37 STAN. L. REV. 1267, 1275 (1985) ("[N]umerous legal and economic commentaries dogmatically maintain that decision makers must evaluate all relevant ecological circumstances, human impacts, and regulatory costs to identify the 'optimal' level of environmental protection in particular controversies or locations."); Thomas O. McGarity, *Media-Quality, Technology, and Cost-Benefit Balancing Strategies for Health and Environmental Regulation*, 46 LAW & CONTEMP. PROBS. 159 (No.3 1983) (considering three fundamental regulatory techniques in the context of health and environmental regulation).

²²³ See Poirer, *supra* note 17, at 64 ("This new wave reflects a maturation of environmental discourse; but the underlying question of a culturally mediated choice of resource management strategies, of which private property is only one, has been implicit all along.")

²²⁴ Frost, *supra* note 21, at 214.

²²⁵ *Id.*

²²⁶ *Id.*

Biosphere Reserves should be developed in urban areas to foster conservation of urban ecosystems, study urban sustainable development, educate urban dwellers on the importance of conservation and their role in the process, and build community support and commitment to developing a lifestyle of sustainability in urban environments. While studying environmental conservation and protection in rural areas is helpful to the planet's ecosystem generally, it is only by creating more sustainable urban environments that we will truly be able to halt the destruction of the world and develop new ideas of how we can all co-exist as a global community, with global awareness of and responsibility of each individual's role in preserving the environment for generations to come. In the words of the Brundtland Report:

Humanity has the ability to make development sustainable—to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs. . . . Technology and social organization can both be managed and improved to make way for a new era of economic growth.²²⁷

Individual action by nations or localities is not enough to combat the global problems created by ecosystem destruction.²²⁸ A concerted effort is necessary to bring local, national, and international decision-making into agreement on adopting policies of sustainable development that take action on education and environmental protection.²²⁹ Only through educating urban citizens and teaching them to live within the bounds of the planet's natural resources will the world reach the objectives of sustainable development. Biosphere reserves have proven successful areas for conserving biodiversity, researching and monitoring ecosystems, and educating people about their

²²⁷ OUR COMMON FUTURE, *supra* note 13, at 8.

²²⁸ See Paper #4, *supra* note 55, at 4.

²²⁹ *Id.* at 5 (“We urgently need to encourage and facilitate wider public awareness, education (both formal and informal) and capacity building to help empower individuals and communities to take direct action towards sustainable development and environmental protection.”).

vital relationship with nature. Purposefully extending this concept into urban areas of high population density will serve to support this relationship, and teach the world's greatest consumers how to live in partnership with nature, and how to live sustainably.