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American Environmentalism and the City: An Ecosystem Services Perspective

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This study traces the evolution of eight influential American environmental organizations and their relationship with, and conceptualizations of, 'the city' and 'nature.' Guided by the ecosystem services framework, the organizations' urban-based initiatives were analyzed to determine what types of ecosystem services they emphasized and what the implications are for cities and environmental health. Results from historical, content, and interview analyses reveal the potential of the ecosystem services framework to unite the interests and efforts of multiple stakeholders, including urbanists, ecologists, economists, and environmentalists in a way that enhances both urban quality of life and conservation efforts overall.

Keywords

environmentalism, ecosystem services, non-governmental organizations (NGOs), environmental history, urban ecology

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I. INTRODUCTION

"Ecosystem Services Come to New York City: The Natural Way to Reduce Pollution," reads the headline of *The New York Observer* on September 3, 2009. The story tells of the $7 million dedicated by the New York Attorney General for the development of *green infrastructure*. "The idea here is to use existing ecosystems to filter pollutants and protect streams and other water sources," writes Cohen (2009:1), noting that artificial pollution control equipment is more expensive to build and maintain than natural systems. Referencing the economic valuation of ecosystem services, a September 2011 headline in *The Economist* (2010) reads: "Money can grow on trees." A major environmental organization, *The Nature Conservancy*, reports that their $4.5 million restoration project in the Mississippi basin will "provide vital ecosystem services such as nutrient cycling, flood storage and water quality enhancement" (TNC 2009:4).

How did this once obscure concept, studied predominantly by ecologists and economists since the 1970s, become recognized as the most logical, economic solution to environmental woes? Does the mainstream adoption of the ecosystem services concept signal an opportunity to merge the seemingly disparate goals and interests of ecologists, economists, urban planners, developers and environmental organizations, or are they all using this term in different ways and towards different ends? This study hones in on one of these interest groups, American environmental organizations, specifically the seven U.S.-based organizations in Rowell's (1996) "Group of Ten"—considered the largest and most influential environmental organizations in the world: the Sierra Club, National Audubon Society, Izaak Walton League, The Wilderness Society, Defenders of Wildlife, National Wildlife Federation, and Environmental Defense Fund. Added to this list was The Nature Conservancy, because of its unusually significant influence and reach (over 1 million members). Using multiple methods, this research investigated if these environmental groups utilize the concept of ecosystem services, where and how the term is applied, and what types of services these groups emphasize, specifically in their urban initiatives. As these organizations represent diverse origins, perspectives, and contexts, the paper begins by tracing the emergence and evolution of the groups and their relationships with, and attitudes toward, cities. These events are also situated in the historical context of the American environmental movement and the rise of the ecosystem services perspective. Finally, the implications of the findings for the environmental movement overall, as well as for the quality of life and sustainability of American cities, is discussed.

The specific research questions guiding the analysis are: 1) Has the attitude of major U.S. environmental organizations towards cities changed over time, and if so, how and why?, 2) Do these organizations frame the benefits of nature, either explicitly or implicitly, in relation to their ecosystem services, and if so, has this been applied to urban areas?, and 3) What urban ecosystem services are emphasized by different environmental groups?

II. BACKGROUND

The American Environmental Movement & the City

In 1800, some 320,000 Americans (6%), lived in urban areas. Over the following decades, industrialization began drawing people to cities to work in cotton mills, shipyards, sawmills, canneries, and other factories. By 1860, urban populations had surpassed six million. By 1920, 54 million Americans, half the country's population, called the city their home. During this same period, federal land policies encouraged the settlement of the vast frontier. By the late nineteenth century, most of the nation's land had been allocated, prompting the claim by Frederick Jackson that the American frontier was no more. George Perkins Marsh's influential book *Man and Nature* (1864) addressed concerns about the waste of natural resources and land degradation in the U.S. and soon "the perception of abundant unexploited lands teeming with wildlife and fertile soils began to turn to one of wasted resources and inefficient use" (Merchant 2002:127). In this "myth of the vanishing frontier," Cronon (1995:76-77) argues, "lay the seeds of wilderness preservation in the United States [and an] ambivalence, if not downright hostility, toward modernity and all it represented"—including cities.

Laissez-faire land policies soon gave way to the era of land preservation, prompting the dedication of national parks, wilderness areas, reserves, and wildlife refuges. Political positions regarding how to treat these landscapes diverged primarily into two camps. Utilitarian conservationists, such as Gifford Pinchot and President Theodore Roosevelt, supported "putting the land to work to promote people's happiness" (Merchant 2002:128). Meanwhile, preservationists including John Muir and Frederick Law Olmsted, viewed nature as sublime rather than utilitarian, and sought to preserve, not manage wild lands (ibid).

Both conservationists and preservationists valued nature for the services and benefits it provided humans. Conservationists held an overtly utilitarian view of nature, primarily focusing on the provisioning of food, fuel, fiber, timber, and water. Though the preservationists seem to have valued nature more for its intrinsic value, they too held a utilitarian view, different only in that it was less *materially* consumptive. John Muir eloquently wrote of the spiritual value of the Sierra Mountains, "God's cathedrals," and extolled the aesthetic and recreational value of these wild lands. Olmsted stressed the importance of nature for mental and physical health, especially for the indigent. Similarly, the dedication of national parks was motivated by a desire to protect the aesthetic and recreational value of protected lands (Merchant 2002).

The post-World War II era gave way to a new version of American environmentalism, less focused on wilderness protection and more concerned with cities, particularly their impact on public health, social justice, and wildlife habitat. Rachel Carson's *Silent Spring* (1962) and Paul Ehrlich's *The Population Bomb* (1968) led to a wave of progressive environmental regulations including the Clean Air Act (1963),

Wilderness Act (1964), Endangered Species Act (1973), Safe Drinking Water Act (1974), and Clean Water Act (1977). The 1970s and 80s saw the emergence of various grassroots and social environmental movements. The environmental justice movement was spurred by evidence that hazardous waste facilities in cities were disproportionately located in minority communities (Merchant 2002). The environmental movement went global with the Montreal Protocol (1987), Earth Summit in Rio de Janeiro (1992), and Kyoto Protocol (1997), and 'sustainability' became a household word following the Brundtland Report of 1987 (WCED 1987).

American Environmental Organizations & the City

Over the course of these developments, impassioned Americans joined together to form non-governmental organizations in response to the rapid urbanization, expansionism, and environmental degradation taking place across the nation. The origins of many of these organizations reflected a distaste for 'the city,' a desire to escape both its dreary built form and its crowds of people, and a preference for nature untouched by humans. Yet later organizations were less anti-urban in nature, possibly signaling a sea change in attitudes towards cities.

The Sierra Club was founded in 1892 by John Muir and Robert Underwood Johnson. The Club's original mission was "to explore, enjoy, and render accessible the mountain regions of the Pacific Coast; publish authentic information concerning them; and enlist the support and cooperation of the people and government in preserving the forests and other natural features of the Sierra Nevada" (Cohen 1988:89). The Club was primarily concerned with increasing peoples' access to wilderness areas to experience their recreational, educational, and spiritual benefits (Cohen 1988).

Thirteen years later, in 1905, The National Audubon Society (NAS) was established. Named after the wildlife painter John James Audubon, the group was formed to address the decimation of shorebirds for women's hats, which was the fashion in trendy American cities at the time. In the 1920s, the Society opened its first bird sanctuaries in Louisiana and Long Island. The organization eventually expanded their mission to the protection of all wildlife, not just birds, and began opening a series of nature centers and large wildlife sanctuaries across the nation (NAS 2010b).

The Izaak Walton League (IWL), named after a famous 17th century angler, was founded in 1922 by 54 avid hunters and fisherman. The group's mission was to "save outdoor America for future generations" (Fox 1985; IWL 2010:1). Will H. Dilg, a Chicago advertiser sick of city life, left his job to head the League in its early years. "I am weary of civilization's madness," said Dilg, "I am tired of your piles of buildings and I ache from your iron streets. I feel jailed in your greatest cities and I long for the unharnessed freedom of the big outside" (in Fox 1985:159). Just three years after its founding, the league had attracted over 100,000 members while the Audubon and Sierra Club maintained less than 7,000 members each (Fox 1985). The group's efforts centered

on public policy, and they claim that, "almost every major, successful conservation program that America has in place today can be traced directly to a League activity or initiative" (IWL 2010:1).

The Wilderness Society (TWS) formed in 1935 in response to industrialization, urbanization, and "the craze to build all the highways possible everywhere" (Fox 1985:211). The founders included Aldo Leopold, Robert Sterling Yard, Benton MacKaye, and Robert Marshall. The group fought to protect "that extremely minor fraction of outdoor America which yet remains free from mechanical sights and sounds and smell" (Fox 1985:211). TWS was instrumental in the passage of the 1964 Wilderness Act that established some 3.6 million hectares of American land as *wilderness*, "where the earth and its community of life are untrammeled by man" (TWS 2010:1). The Act also gave Congress the power to designate areas in national forests, parks, wildlife refuges, and other federal lands free from development or motorized transportation (Fox 1985).

Founded a year after TWS, the creation of The National Wildlife Federation (NWF) was motivated by the "market killing of the buffalo, waterfowl, and other wild game species…decimating America's wildlife to support the growing work force and urban appetites" (NWF 2010:1). With a focus on conservation policy, the group has helped pass some 70 legislative acts since its establishment (NWF 2010).

In 1947, the Defenders of Wildlife (originally named Defenders of Furbearers) was organized "to protect coyotes and other furred animals from steel-jawed leg-hold traps and lethal poisons" (DOW 2010:1). Their efforts were designed to protect endangered animals and their habitats and reintroduce displaced species. The group led the campaign to reintroduce wolves to Yellowstone National Park and helped to establish the Bald Eagle as endangered (ibid).

Established in 1951, The Nature Conservancy's primary goal was, and still is, to protect a piece of every major habitat type on the planet as "living museums of the primitive world of nature…for their great scientific, educational, and aesthetic values" (Birchard 2005:5). This goal differs from the other environmental organizations in that 'scenic value' took a back burner to a landscape's significance as a sample of unaltered nature.

The Environmental Defense Fund (EDF), was formed in 1967 by a group of lawyers and scientists who claim to have "raised environmental litigation to an art form" (Fox 1985:304). The group expressed contempt for traditional American conservationist groups for what they considered a lack of political, legal, and scientific rigor, and an ethic of "primitivism, anti-urbanism, anti-materialism, and technophobia" (Fox 1985:322). Charles Wurster, one of the founding members of EDF criticized the American conservation movement for "talking to themselves in a closed ecosystem" (in Fox 1985:306). Primarily addressing issues of pollution, the group took a novel approach to

conservation by involving experts in science, law, and politics—and taking their issues to the courtroom (Fox 1985).

Ecosystem Services & the City

Paralleling trends in the American environmental movement and the rise of influential non-governmental organizations, the field of ecosystem ecology emerged in the 1940s and has also recently turned its cites to urban landscapes. Originally focused on the food chain, energy flows, and cycles within ecosystems, the discipline took a turn in the 1960s along with the environmental movement. Ecologists began to warn of the degradation of "ecological systems upon which the very existence of the human species depends" (Ehrlich and Ehrlich 1972:157). The concept of ecosystems providing *services* critical to human health and well-being was highlighted in a 1970s report (SCEP 1970) that included a list of "environmental services" that would degrade if the ecological functioning of a landscape was compromised; these services included pest control, insect pollination, fisheries, climate regulation, soil retention and formation, and flood control. Over the subsequent decades, numerous additions would be made to this list of environmental benefits under terms such as *public services of the global ecosystem*, *ecological services*, and *nature's services* (Daily 1997:14-15).

The term *ecosystem services* was officially introduced by Ehrlich and Ehrlich in 1981. The term was intended to communicate the value of nature to people through the understanding of its impact on human well-being (Gómez-Baggethun et al. 2009). The concept became mainstream in the late 1990s with Daily's (1997) *Nature's Services*, and economic valuation gained considerable attention following Costanza's (1997) controversial article on the monetary valuation of ecosystem services. The flagship report on the state of the world's ecosystems followed soon after with the launching of the Millennium Ecosystem Assessment (MA 2003). The MA (2003:53) organized ecosystem services, defined as "benefits people obtain from ecosystems," into four categories: provisioning (tangible, consumable products), regulating (regulate ecosystem processes), supporting (support ecosystem functions), and cultural (nonmaterial or intangible goods).

Some scholars warn that the "utilitarian framing of ecological concerns and market strategies," inherent in the ecosystem services concept is dangerous as it "may modify the way humans perceive and relate to nature in a way that in the long run may be counterproductive for conservation purposes" (Gómez-Baggethun et al. 2009:1209). Gómez-Baggethun et al. (2009) assert that the move towards commodification of nature was a result of changes in economic theory away from the "use" value of nature, towards "exchange" values. Yet other scholars contend that, if conveyed properly, the concept may help people comprehend and appreciate the value of nature, thereby enhancing conservation efforts. "Ecosystem services are absolutely essential to civilization, but modern urban life obscures their existence" writes Daily (1997:7), "yet once explained, the importance of ecosystem services is typically quickly appreciated." A successful approach though, Daily and Ehrlich (1999) contend, must draw from multiple

perspectives as the "failure to recognize the footprint of such problems on what might be thought of as a multidimensional, multidisciplinary surface could lead at best to silly, naive 'answers' and, at worst, to bad policies with serious societal consequences."

There is now growing consensus that the ecosystem services framework could also enhance conservation efforts in cities, and should therefore be integrated into urban planning, policy, and decision-making (Cadenasso and Pickett 2008; Lovell and Johnson 2009; Sander 2009; Daily et al. 2009; Schilling 2010). The framework is well-suited to urban conservation as it conceptualizes human and natural systems as linked or coupled (Liu 2007), allowing for the integration of both social and ecological considerations into planning and decision-making (Schilling 2010). Also, empirical research has determined that urban elements and landscapes including street trees, lawns, parks, urban forests, cultivated land, wetlands, lakes, and streams, provide a variety of ecosystem services such as: air filtration, micro climate regulation, noise reduction, rainwater drainage, sewage treatment, recreational and cultural values (Givoni 1991; Bolund and Hunhammer 1999; Scott et al. 1999). Further, evidence that urban form significantly impacts the ecological performance of landscapes (Tratalos et al. 2007), and that locally generated ecosystem services substantially enhance urban quality of life (Bolund and Hunhammer 1999), also make the case for applying the ecosystem services framework to urban initiatives.

III. METHODS & ANALYSIS

In order to enhance understanding of the use, application, and history of the ecosystem services framework, particularly as applied to cities by American environmental organizations, this study utilized a mixed-method approach using both primary and secondary data. Specific methods applied include historical, archival, and content analyses along with a review of literature. Such methodological triangulation not only provides a deeper, more complete and nuanced picture of complex human-environment relationships (Ruddell 2009), but also validates that research findings are not tied to a particular approach (Campbell and Fiske 1959; Johnson et al. 2007). Primary data was collected using explicit reports (interviews) and by coding organizational documents (annual reports). Secondary data was gathered from the organizations themselves and from other independent sources, and included books, newspaper articles, historical accounts, organizational histories and reports, online materials, and scholarly literature.

Historical methods are a valuable, some argue essential, first step in research as it helps researchers "identify themes embedded in their work, avoid re-inventing systems that already exist, and establish background prior to user observation or interviewing" (Wyche and Sengers 2006: 38). As such, historical and archival analysis was applied to understand if, and how, the attitudes of major U.S. environmental organizations towards cities have changed since their founding, and to provide a solid foundation for the subsequent components of the research.

The content analysis then systematically assessed if the organizations framed the benefits of their urban initiatives, as described in their annual reports, in terms of ecosystem services, either explicitly or implicitly. This approach was also applied to determine which urban ecosystem services were emphasized by the various groups, and which lacked consideration. The widely cited definition of ecosystem services as, "the benefits people obtain from ecosystems" (MA 2003:53), is far from a novel concept. As noted by Daily (1997:11), though the "explicit recognition of ecosystem services is a relatively new phenomenon, the notion that natural ecosystems help to support society probably traces back to the time when our ancestors were first able to have notions." For this reason, the content analysis was not concerned with the intentional, explicit use of the word *ecosystem services*, but rather how the value, benefits, and services provided by nature (broadly defined), were framed. Annual reports were deemed appropriate for this analysis for two primary reasons. First, the reports are not exhaustive descriptions of the organizations' yearly activities, but rather highlight particular aspects of an organization's initiatives; as such, they offer valuable insight regarding which initiatives each organization prioritizes. Second, as all but one of the groups (IWL) produced annual reports, the documents allowed for comparisons across organizations.

The first phase of the content analysis consisted of coding the previous two years' annual reports from each organization's national headquarters (Appendix I)[1]. First, all explicit references to urban-focused initiatives or programs were extracted from the reports. This included any programs that directly engaged urban residents, businesses, universities, or other stakeholders in conservation efforts, or that sought to improve the social, economic, or ecological health of cities. Next, the ecosystem services listed in Table 1 were coded based on the benefits of urban initiatives cited in the reports. Each service was coded only once per organization so as to illustrate the breath of ecosystem services covered by the organizations as a whole and to highlight those services not emphasized, while minimizing error.

Four categories of services were analyzed: *provisioning, regulating/supporting*, *cultural,* and *economic*. The economic category was added to the original MA (2003) classifications because of its paramount importance to urban ecosystems, and the categories of regulating and supporting services were combined. Within each of these categories, specific services were analyzed, based on deGroot et al.'s (2009) list, with six additions by the author (i.e. educational benefits, community-building, environmental justice, and all three economic services). Therefore a total of 23 services were analyzed (Table 1). Results were tallied for each service by organization (Appendix II), and then aggregated by service category. The highest possible 'score' for each organization was 23 (100%), which would indicate that through their urban initiatives, they claimed to have provided all 23 ecosystem services.

[1] Reports for the NAS and TWS were only available for the past year, 2009. The IWL did not have a typical annual report, but rather just a list of "Conservation Policies" so they were removed from the content analysis.

Interviews with local members of the organizations (in Arizona) were also incorporated in this research, primarily to: i) provide a micro-scale, local perspective, ii) validate/refute the findings of the other methodological approaches, and iii) enhance the understanding of the results overall. Four 60 to 75-minute interviews were conducted with members of the organizations that maintain branches in Arizona: the Audubon Society, The Nature Conservancy, The Defenders of Wildlife, and the Sierra Club[2]. Following a semi-structured approach, open-ended questions were posed to stimulate candid discussions regarding: i) current initiatives/programs aimed at urban areas or urban residents, ii) the organizations' explicit or implicit use and/or application of the ecosystem services framework either in or outside urban areas, and iii) the perceived implications of applying an ecosystem services approach to conservation.

IV. RESULTS

This section presents first the results of the historical and archival analysis on American environmental organizations and the city, highlighting their current attitudes towards and engagement with cities. The second section reports the results of the content analysis, which identified the specific benefits and services emphasized by each groups' urban initiatives. The final section highlights pertinent information from the interviews related to the research questions.

American Environmental Organizations & the City—Today

Since the dawn of industrialization, influential non-governmental organizations emerged in response to the environmental concerns of the day. Founded by groups of passionate citizens, most organizations sought to protect pristine wilderness and wildlife from the commercialization, privatization, and exploitation of the city. Yet results of this study reveal that today many of these organizations have transcended their traditionally anti-urban roots, and have even come to appreciate the multiple ecosystem services provided by urban landscapes.

Today, scope of the Sierra Club has expanded substantially since its founding nearly 120 years ago. With over 800,000 members and 60 local chapters, the mission now emphasizes the education and engagement of people in the protection and restoration of natural *and* human environments (Sierra Club 2010:1). A community outreach program, *Inner City Outings*, promotes social integration, community-building, environmental stewardship, and nature appreciation by involving urban youth in outdoor activities both in and outside of cities (Sierra Club 2010). The Club's *Local Outings* program offers "forays into the remaining natural areas of our major cities" (Sierra Club 2010:1). The Arizona chapter of the Sierra Club promotes smart growth principles

[2] Though the National Wildlife Federation has a local office, they were unavailable for an interview and were therefore excluded from this part of the analysis.

including high-density housing, mixed uses, bike paths, and pedestrian-friendly infrastructure (per comm, Bahr[3]).

Recognition that urbanization is causing a rift between people and the natural world has prompted the Audubon Society to begin actively engaging cities and their inhabitants. The group saw this as detrimental to the health and well-being of both systems and so began a campaign to bring nature into the city "in order to reach people who had little to no access to nature education" (NMPRS 2010:1). To this end, they opened urban Audubon Centers in Brooklyn (2002), Los Angeles (2003), and Heleiwa, Hawaii (2003). In 2009, the Platinum LEED Nina Mason Pulliam Audubon Center was opened in a low-income neighborhood of Phoenix, AZ. The Center provides interactive exhibits, trails, school curriculum, and community events, as well as K-12 and high school programs (NAS 2010a).

Today, the Izaak Walton League maintains its focus on public policy and their utilitarian perspective on nature's value, yet their eye has also turned to the city. Progressive conservation policies heavily engage cities and stress improving urban quality of life through sustainable growth, sprawl management, improved mass transit, green building, renewable energy, participatory decision-making, and social justice (IWL 2008). The group also engages middle and high school students in hands-on science with *Project Watershed* and trains citizens on wetland protection through the *Protect Our Wetlands* project.

The Wilderness Society's current campaigns, for the most part, reflect the organization's original vision. Efforts focus on protecting wild places, natural heritage, pristine forests, and public lands from development, global warming, and "irresponsible energy development" (TWS 2010:1). The only urban-related initiative mentioned in their annual reports was the protection of a natural area in close proximity to a city (TWS 2009).

Over the years, the National Wildlife Federation has grown to appreciate the city, noting that "many of the nation's greatest environmental challenges and opportunities are found in our urban centers" (NWF 2010:1). NWF's urban initiatives focus on enhancing water and air quality, improving housing and transportation systems, supporting urban community gardens, farmers' markets, and urban parks, as well as restoring brownfield sites, creating green jobs, and promoting social justice and community-building. NWF's *Midwest Urban Initiative* engages the ten largest urban centers in the Great Lakes region and their *Certified Wildlife Habitat program* offers certification for people who practice sustainable gardening and provide food, water, and shelter for backyard wildlife (NWF 2010).

[3] In-person interview with Sandy Bahr, Director of the Sierra Club's Grand Canyon Chapter (Nov 2010).

The Defenders of Wildlife has recently broadened their focus to include protecting biodiversity and wildlife habitats, though the primary objective remains the protection of large carnivorous mammals. This is likely why their engagement with cities is limited. Yet there *are* some signs that the organization is engaging the urban landscape. Updike (2004:1), a writer/editor for *Defenders Magazine*, wrote about the enthusiasm of city dwellers upon seeing large birds of prey "in the unfamiliar habitat of skyscrapers and roads," noting that the presence of "urban raptors" is a valuable asset to the city. The group also acknowledges the importance of urban greenways and trails for biodiversity protection, noting that they provide connectivity between open spaces that serve as critical urban wildlife corridors (Hudson 1991). The organization is the only one included in this study that has employed economic valuation of ecosystem services to battle sprawl and encourage conservation-oriented planning (Rappaport Clark 2007).

While maintaining their original mission, The Nature Conservancy has also recently expanded the reach and focus of their initiatives acknowledging that, "in our quest to create a sustainable world, solutions will emerge both in our own backyards and oceans away" (TNC 2008:4). Programs directed at urban areas include watershed conservation in São Paulo, Brazil and Bogotá, Colombia, an *Internship Program for City Youth* that takes New York students to work on nature preserves for a month, and *Development by Design*, which seeks not to stop but guide development in a way that provides "a net beneficial impact on nature" (TNC 2009:35). One of TNC's "first major investments in urban areas," *Project Wet* teaches students in Phoenix, AZ about water quality and the water cycle (pers comm, Marshall[4]).

In the last ten years, the Environmental Defense Fund's campaigns have battled issues of climate change, pollution, and water law. Since their efforts are at the state and national scale, the EDF directly and indirectly impacts numerous cities across the nation. Recent successes include helping to pass a bill to cap greenhouse gas emissions in California, persuading the ports of Los Angeles and Long Beach to cut their emissions in half, and establishing the world's largest marine reserve in Hawaii. The groups is also heavily involved with environmental issues abroad, promoting economic incentives to reduce emissions and power plant pollution in several Chinese cities including Beijing, where they are also working to build a market for environmental commodities. Their partnerships with major American businesses have led to significant reductions in solid waste and greenhouse gas emissions by eliminating foam boxes in McDonalds and working with FedEx and Coca-Cola to create "the world's first commercially successful hybrid delivery truck" (EDF 2008:7).

[4] Phone interview with Robert Marshall, Director of the Center for Science and Public Policy at The Nature Conservancy, Tucson (November 2010).

American Environmental Organizations & Urban Ecosystem Services

Results of the content analysis revealed that though a variety of urban ecosystem services were emphasized by the organizations in their annual reports, not all were given equal attention. Of the 23 urban ecosystem services measured, all but three (spiritual values, soil/erosion protection, and protection/provisioning of medicinal materials) were cited by at least one organization. The most commonly cited category was cultural (38%), followed by regulating/supporting (29%), economic (18%), and lastly provisioning (16%) (Table 1). Cultural services centered on educational benefits (62%), while scant attention was paid to cultural heritage and artistic inspiration (13% each), and none to spiritual values. Regulating/supporting services primarily emphasized habitat protection (50%), followed by climate regulation and hazard mitigation (both 38%). None of the organizations emphasized soil erosion/protection, and few specifically addressed protecting biodiversity (13%) in urban areas. Of the economic benefits, organizations tended to focus on job training/creation (50%). Provisioning services prioritized by the groups were fiber, fuel, and other raw materials (50%) and water (38%).

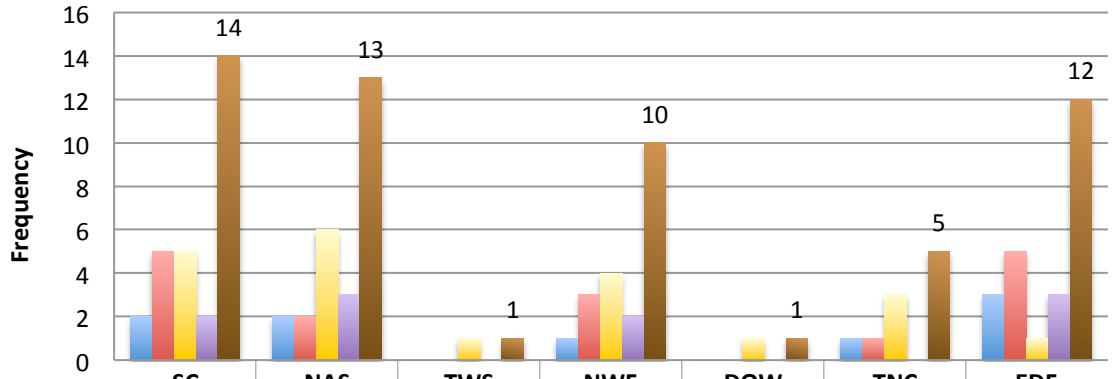
The organizations were also given 'scores' that reflect the diversity of services emphasized by their urban initiatives. Overall scores by organization (of 23 urban ecosystem services measured) ranged from one to 14, with a mean of eight. For example, TNC scored five, indicating that their urban-based efforts emphasized five of the 23 urban ecosystem services in the list. The Sierra Club (n=14, 61%), NAS (n=13, 57%), EDF (n=12, 52%), and NWF (n=10, 43%) provided the most services and were above the group mean. The organizations below average include TNC (n=5, 22%), TWS (n=1, 4%), and DOW (n=1, 4%) (Fig 1). These results suggest that the efforts of the Sierra Club, NAS, and EDF provide the most diversity of ecosystem services to urban areas and residents, while TWS and DOW contributed the least.

The Sierra Club emphasized regulating/supporting, and cultural services over provisioning and economic, while NAS focused most on cultural services. The urban efforts of EDF contributed most to regulating/supporting and economic goals, while TNC stressed cultural benefits. TWS and DOW scored the lowest of all the organizations, emphasizing only cultural services in their urban-based initiatives. Of all the groups, the cultural services were best represented by NAS and the Sierra Club, while provisioning was best covered by EDF. The Sierra Club and EDF equally supplied regulating/supporting benefits over other groups, while economic gains were mostly attributed to NAS and EDF.

Table 1. Urban ecosystem service results by category

Category	Service	Description/Examples	Counts (%)**	Category Total (%)**
Provisioning (n=4)	Food	agriculture, local foods, gardens	2 (25)	9 (16%)
	Water	protecting/managing water supplies	3 (38)	
	Fiber/fuel	protecting/managing materials	4 (50)	
	Medicinal	protecting/managing genetic, biomedical, or medicinal materials	0 (0)	
Regulating & Supporting (n=8)	Air quality	protecting/maintaining fresh air	2 (25)	16 (29%)
	Climate regulation	reducing greenhouse gas emissions	3 (38)	
	Hazard mitigation	natural hazard mitigation	3 (38)	
	Water regulation	protecting/maintaining fresh air	2 (25)	
	Waste treatment	reducing waste, cleaning up waste	1 (13)	
	Soil/erosion protection	protecting soil, reducing erosion (e.g. planting trees, grass on slopes)	0 (0)	
	Habitat protection	creating, protecting, managing habitat	4 (50)	
	Biodiversity	protecting/managing species	1 (13)	
Cultural (n=8)	Aesthetic	opportunities for nature appreciation; beautification	3 (38)	21 (38%)
	Recreational	hike, bike, walk trails and other recreational infrastructure	3 (38)	
	Artistic inspiration	inspiration for art or design	1 (13)	
	Cultural heritage/identity	culturally significant landscapes, elements, events, species	1 (13)	
	Spiritual	spiritually significant landscapes, elements, events, species	0 (0)	
	*Educational benefit	opportunities for learning (e.g. school programs, interpretive signage)	5 (63)	
	*Community-building	programs that bring together the community	4 (50)	
	*Environmental justice	focus on providing benefits to underrepresented groups	4 (50)	
Economic (n=3)	*Economic stimulation	stimulating local economic activity	3 (38)	10 (18%)
	*Job training, creation	providing job training, internships, career counseling; creating jobs	4 (50)	
	*Reducing costs	reducing costs (e.g. energy, resources)	3 (38)	

*categories added by the author, all others from deGroot 2009; ** total number provided and % of total



	SC	NAS	TWS	NWF	DOW	TNC	EDF
Provision (n=4)	2	2	0	1	0	1	3
Reg/Sup (n=8)	5	2	0	3	0	1	5
Cultural (n=8)	5	6	1	4	1	3	1
Economic (n=3)	2	3	0	2	0	0	3
Total (n=23)	14	13	1	10	1	5	12

Figure 1. Urban ecosystem service results by organization

Interviews conducted with members of the local chapters of the Sierra Club, Defenders of Wildlife, and The Nature Conservancy provided further insight into the findings of the historical and content analyses. Sandy Bahr, the director of the Sierra Club's Grand Canyon Chapter, has been working with the group for some 20 years. Robert Marshall, the director of the Center for Science and Public Policy, has been working for TNC for over 14 years. Matt Clark has been the Southwest representative of the DOW for the past three years and serves on two committees, one for the City of Tucson and another with the Town of Marana, AZ. Valerie Ramos, the Outreach and Marketing Specialist at the South Phoenix Audubon Center, joined the Center soon after it opened in 2009.

Several interviewees reported that their organizations had evolved to embrace urban areas in their conservation efforts. This move towards the city was often attributed to an understanding of the interconnectedness between not only people and nature, but cities and conservation. Referring to this shift, Marshall (TNC) stated, "our organization has matured and we now realize that you need to work with people if you want to make the world better… because it's about people and nature, it's not about people *or* nature or people *versus* nature—we need each other. And most people live in urban areas." "This is the city, we're not trying to hide that," said Ramos (NAS) while pointing to the skyscrapers beyond the NAS's urban restoration project in Phoenix, AZ, "but this area also has value as wildlife habitat." Though Clark admitted DOW did not often directly engage with cities, he said a realization that "everything is connected" has led the organization to expand their mission from the protection of wildlife to the protection of

all ecosystems. DOW's 'quasi-urban' initiatives mainly focus on protecting lands from development and/or working with cities and developers to protect wildlife habitat, said Clark.

Another common sentiment was that the organizations wanted to become more involved in urban areas, but that their resources were too limited. "One of the hardest things is choosing what *not* to do," said Bahr (SC), "environmental protection is like working in an emergency room, and there are things that don't get done, but there are only 24 hours in a day." On the other hand, Bahr noted that there is great diversity among the Sierra Clubs' chapters, and that each prioritizes different issues that constantly shift based on "what people care about and what is going on." The group also tries to expand its influence by both empowering people to advocate for issues on their own and pushing for policy that will have broader impacts.

Regarding the use and applicability of the ecosystem services concept to conservation efforts, the respondents had mixed opinions. Bahr (SC) said, "I think people get [the concept of ecosystem services] on some level, but I don't think people understand it in those terms." For this reason, Marshall (TNC) said, "we talk in terms of *nature's benefits*. No one knows what 'ecosystem services' are, it doesn't resonate with the public at all. People understand *nature's benefits*." The concept has value, Marshall (TNC) noted, because it provides a way to connect to people with different values: "What it comes down to is what people value. We're not going to change people's values, all you can do is try to find a common ground instead of saying 'here, this is good for you, take it.' That's what the nature's services and ecosystem services paradigm has really forced us to do." Marshall (TNC) also pointed out that society is faced with making decisions regarding environmental and social issues all the time, and the benefit of the ecosystem services perspective is that it allows the consideration of tradeoffs, even if the science is not perfect. "There are going to be consequences no matter what we do, but we need to know what those consequences are so we can make better decisions—when it comes down to it we *do* have options," he said. Bahr (SC) agreed that communicating the utilitarian value of nature could be an effective component of environmental protection campaigns, but felt that it was not enough. "I do think there is a danger. The danger is if there is something we cannot attach a value to, does that mean we write them off? It needs to be put in a larger context," she said.

V. DISCUSSION & CONCLUSION

New Urbanist Andres Duany (2007), claims there are four distinct types of environmentalists: 1) *Ethicists* who focus on the intrinsic value of nature and are provoked by feelings of guilt regarding the negative impact of humans on the natural world, 2) *Trendsetters* who are primarily motivated by the social benefit of engaging in sustainable behavior (e.g. Prius owners), 3) *Opportunists*, attracted to the economic benefits of sustainable practices (e.g. solar panels to reduce energy costs), and 4) S*urvivalists* motivated to act sustainably for fear of environmental catastrophe (e.g. peak

oil). Similarly Paul Soglin, Mayor of Madison, WI, once stated, "There are two types of environmentalists: those who understand that the city is part of the environment and those who do not" (ARN 2010).

This research illustrates that there too are different types of environmental *organizations*. Some organizations are more like Duany's opportunists, and some more akin to ethicists, some who acknowledge the city as 'part of the environment' and others who maintain an overall perception that people are simply disturbances on the natural world. Cronon (1995:80) warns that a view of nature that "leaves no place for human beings—save perhaps as contemplative sojourners enjoying their leisurely reverie in God's natural cathedral… can offer no solution to the environmental and other problems that confront us." This dualism and anti-urbanism was once at the core of the American environmental movement, and inspired the formation of many now influential conservation groups, but many of these organizations have evolved to embrace humans and their home in cities, as has been highlighted in this study. For some, the turn towards the city was inspired by the belief that managing development, resource consumption, pollution and waste generated by cities would help the organization's conservation goals outside the city. In other cases, organizations now realize the importance of bringing nature closer to home, and have acknowledged the multiple ecosystem services urban landscapes can provide. Some groups have even come to understand humans, nature, and cities as intimately linked, and therefore mutually beneficial or detrimental. The shift of many of these groups towards the protection, restoration, and appreciation of human environments is significant as it suggests a move away from the historically anti-urban sentiments of the American environmental movement and the potential for local and regional governments and citizen groups to engage these organizations in urban initiatives aimed at increasing urban sustainability and quality of life.

Results also indicate that several of the organizations have begun to apply the ecosystem services framework, either explicitly or implicitly, both within and beyond urban boundaries. As such, the framework represents a potentially valuable tool for uniting various public and private interest groups in urban conservation. Yet important patterns were highlighted that warrant consideration as they may have significant implications for urban ecosystems. Specifically, different sets of urban ecosystem services were commonly emphasized by the groups (e.g. educational benefits), while others were largely ignored, including cultural heritage, artistic inspiration, spiritual values, and provisioning services such as soil/erosion protection and protection/provisioning of medicinal materials. A lack of consideration of the economic benefits of urban ecosystems—such as increasing real estate values, attracting businesses/tourism, and reducing costs (e.g. energy via microclimate regulation)—also highlights potential avenues for expansion. As interviews indicated that such gaps exist due to lack of resources by these large national organizations, these groups should seek to partner with local and regional government and other entities (e.g. church/park groups, neighborhood associations) to increase their reach, bolster their conservation efforts, and further enhance ecosystem services in cities. Another finding shows that individually

some organizations emphasized a broad array of services in their annual reports, while others focused on a small set. This research can therefore help organizations by pointing out how effectively their urban initiatives are being communicated (or not) thus revealing areas for improvement and expansion. Also, these results can serve as a communication tool between organizations—illustrating what other groups are doing and perhaps inspiring others to enhance or develop new urban initiatives aimed at enhancing urban ecosystem services.

Finally, this study points to the potential benefits and dangers of the ecosystem services perspective. There is danger that a utilitarian framing may ignore those aspects of nature that do not have an observable direct, use or benefit to humans, thus increasing the intellectual and philosophical divide between conservationists, ecologists, economists, urbanists, and other groups. Further, results also warn that the commodification of nature can have serious ecological implications, a sentiment echoed by Cronon (1995), Daily and Ellison (2002), and Gómez-Baggethun et al. (2009). Yet if framed and applied appropriately, an ecosystem services perspective can facilitate collaborations and enhance efforts aimed at improving the sustainability and quality of life in cities, first by quantifying how valuable (monetarily speaking) these services are (Daily and Ellison 2002). Authors of the *The Economics of Ecosystems and Biodiversity* (TEEB 2010:3) study note that "valuation is seen not as a panacea, but rather as a tool to help recalibrate the faulty economic compass that has led us to decisions that are prejudicial to both current well-being and that of future generations." Communicating the value of nature in this way may therefore help individuals and groups understand and appreciate the otherwise invisible benefits of the natural world, and thereby "embrace the full continuum of a natural landscape that is also cultural, in which the city, the suburb, the pastoral, and the wild each has its proper place" (Cronon 1995:89).

APPENDIX I. Information about the organizations and reports analyzed in this study

Organization	Year founded	Local chapter location	Headquarters location	Report Years (total pgs)*
Sierra Club	1892	Phoenix, AZ	San Francisco, CA	2008, 2009 (88)
National Audubon Society	1905	Phoenix, AZ	New York, NY	2009 (30)
Isaac Walton League	1922	-	Gaithersburg, MD	2008 (100)
The Wilderness Society	1935	-	Washington, DC	2009 (36)
National Wildlife Federation	1936	Mesa, AZ	Reston Virginia	2008, 2009 (49)
Defenders of Wildlife	1947	-	Washington, DC	2008, 2009 (67)
The Nature Conservancy	1951	Phoenix, AZ	Arlington, VA	2008, 2009 (116)
Environmental Defense Fund	1967	-	Washington, DC	2008, 2009 (67)

* only the most recent reports for NAS and TWS were available. The IWL does not publish annual reports so their *2008 Conservation Policies* report was used for this part of the analysis.

APPENDIX II. Urban ecosystem service analyzed in this study: Results

Category	Service	SC	NAS	TWS	NWF	DOW	TNC	EDF
Provisioning (n=4)	Food	x						x
	Water		x				x	x
	Fiber, fuel, & other raw materials	x	x		x			x
	Medicinal							
Regulating & Supporting (n=8)	Air quality regulation	x						x
	Climate regulation	x			x			x
	Natural hazard mitigation	x			x			x
	Water regulation	x						x
	Waste treatment							x
	Soil/erosion protection							
	Habitat protection	x	x		x		x	
	Biodiversity protection		x					
Cultural (n=8)	Aesthetic	x	x		x			
	Recreational	x	x	x				
	Artistic inspiration		x					
	Cultural heritage/identity						x	
	Spiritual							
	*Educational benefit	x	x		x	x	x	
	*Community-building	x	x		x			x
	*Environmental justice	x	x		x		x	
Economic (n=3)	*Economic stimulation	x	x					x
	*Job training, creation	x	x		x			x
	*Reducing costs		x		x			x

* added by the author, all others from deGroot 2009; ** total number provided and % of total

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