Urban Ecology: History and Practice

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Senior Honors Thesis

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April 26, 2005

I would like to dedicate this work to my talented, generous, and beautiful mother,

Dr. Katherine J. Nolan, for her endless support and love.

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ONE:

THE EVOLUTION OF

URBAN ECOLOGY

The study of human interactions with nature in the context of urban environments has evolved over the past fifty years. The earliest writers who were able to view urban areas as ecosystems, whether or not they were able to use ecological terms to describe it, planted the seeds for what is today an important and growing movement across the United States. These early writers, such as Aldo Leopold, Jane Jacobs, and Ian McHarg, established certain principles based on their observations of human behavior in relationship to the natural world. These writers paved the way for later scholars to develop human- and ecologically-based natural histories, to imagine land uses, urban planning and development in new and sustainable ways, and to reinforce the spiritual and emotional bond between humanity and nature.

Out of this progression of thought, and particularly in the last ten to fifteen years, organizations in urban areas around the United States have begun to look at planning and development with both an ecological lens and a focus on community-based, grassroots organizing. The layers of information available for study in an urban area are many and complex: from the palimpsest nature of urban in-filling to the threat of urban and exurban sprawl, from the legacy of industry and agriculture to concerns over affordable housing, from safety and health to pollution and aesthetics, cities provide an immense amount of data to those who choose to study them.

This study will first trace the theoretical development in understanding urban ecosystems from Aldo Leopold to the present day, touching on important themes and groundbreaking authors. Subsequent chapters will build on the foundation laid by these authors in an exploration of the current practical use of urban ecology in the field, focusing on community-based organizations throughout the country.

Leopold, Jacobs, McHarg: The Pioneers of Urban Ecology

In his essay "The Land Ethic," Aldo Leopold says: "There is as yet no ethic dealing with man's relation to land and to the animals and plants which grow upon it. Land…is still property. The land-relation is still strictly economic, entailing privileges but not obligations" (238). From the point of view of a naturalist living in the mid-twentieth century United States, land use was based more on commodification than on a sense of responsibility. Few at that time thought any differently from most of the early colonists, who viewed all natural resources in terms of market value. Few people recognized the relationship that exists between human society and the natural world. But Leopold, with characteristic foresight, thought that "the extension of ethics to this third element in human environment is…an evolutionary possibility and an ecological necessity" (239). Without a clear agenda for the coexistence of humans and the environment, human activity would continue to operate destructively, not only damaging the natural world but, in turn, threatening the existence of humanity itself.

Though, at the time he was writing, Leopold drew more on direct experience and historical traditions, his concepts clearly foreshadow the emergence of a field of study which places humans into the ecological framework. When Leopold talks about the land ethic, he describes it as extending the idea of an individual in a community to land, plants, and animals. Seemingly radical at the time, his idea defines the current view of ecology, which includes humans as equal members in the exchange of energy that defines an ecosystem. "In short, a land ethic changes the role of *Homo sapiens* from conqueror of the land-community to plain member and citizen of it. It implies respect for his fellow-members, and also respect for the community as such" (240).

What, then, is the role of humans in this larger, land-based community? Our place is no more elevated than that of any other individual or group, yet our effect can be profoundly different. While Leopold never suggests that humans only affect the land negatively, nor that they are the only existing destructive force in an ecological community, he does recognize that humans have the power to alter the land in quite dramatic ways. Describing the results of overgrazing in the American Southwest, Leopold details the various, inter-connected, and long-lasting effects that the pioneers had on their landscape. In addition, he contrasts the European settlers' effect on the land with that of a previous alteration: the residence of the Pueblo Indians. The Native Americans definitely destroyed, damaged, altered, and reshaped their landscapes in various ways, but their effect was both less extensive over the land surface and less insidious. In this example one can see the differences between the land ethics of two societies. One, the European settlers, viewed the land as a resource open for exploitation. The other felt a spiritual bond to the land, and, through this bond, a moral obligation to protect its resources and live in harmony with it.

Leopold says that "many historical events, hitherto explained solely in terms of human enterprise, were actually biotic interactions between people and land. The characteristics of the land determined the facts quite as potently as the characteristics of the men who lived on it" (241). Thus, a natural history of any place must take into account both the changing ecology and the changing society, as later authors such as William Cronon and Brian Donahue do.

Finally, Leopold argues for more aggressive environmental education, with better content and a focus on the inherent worth of community members rather than their

economic value. “Conservation is a state of harmony between men and land,” he says, and clearly we are not yet at that point of harmony (243). But Leopold has hope. He says: “We have no land ethic yet, but we have at least drawn nearer the point of admitting that birds should continue as a matter of biotic right, regardless of the presence or absence of economic advantage to us” (247).

Unlike Leopold, Jane Jacobs does not talk explicitly about conservation in *The Death and Life of Great American Cities*. However, her observations of real city life and her understanding of the inner workings of neighborhoods reveal a clearly scientific approach. Her description of a neighborhood seems as complex as an attempt to define an ecosystem: members have different spatial ranges and the physical boundaries are not always obvious (120). Jacobs says that “the tactics for understanding both [life sciences and cities] are similar in the sense that both depend on the microscopic or detailed view” (439). These tactics are: “1. To think about processes; 2. To work inductively, reasoning from particulars to the general, rather than the reverse; 3. To seek for “unaverage” clues involving very small quantities, which reveal the way larger and more “average” quantities are operating” (440). Thus, Jacobs focuses on three small yet essential elements of successful neighborhoods: streets, parks, and diversity.

Streets and their accompanying sidewalks must be safe in order to be well-used, and must be well-used in order to remain safe. Sidewalks, according to Jacobs, are good for “unspecialized play” among children, which must be passively observed by neighbors and local business people, the so-called eyes on the street. “In real life, only from the ordinary adults of the city sidewalks do children learn—if they learn at all—the first fundamental of successful city life: People must take a modicum of public responsibility

for each other even if they have no ties to each other" (82). Streets must also be frequent, with short blocks, in order break up monotony and encourage the incidental meeting of different people (180).

Parks, much like streets, must be well-used in order to be safe. In fact, Jacobs claims that underused parks are both dangerous in themselves and contribute to making the surrounding streets dangerous too (95). A park is only as good as the neighborhood around it, and a park gives back to the community what it receives, good or bad. Jacobs lays out four characteristics of successful parks: intricacy (particularly at eye level and both in form and use); centering (focusing on a climax point); sun and shade; and enclosure (a shape defined by surrounding buildings). With these four characteristics in place, a park must also do what a street must do: attract different people at different times of day for different purposes.

Thus Jacobs argues that diversity is an essential characteristic of any successful neighborhood, particularly in the mix of residential, commercial, and cultural edifices. Cities are blessed with a diversity of small businesses, and these must vary in the times that they are open, the services they offer, and the customers they draw both from the neighborhood and from outside it (147). When this is true, the streets and parks will also benefit from a variety of visitors, for a variety of purposes, at a variety of times. Thus, the streets and parks are being watched, the children are safe to play, and the neighborhood benefits from the vitality of use.

In addition to streets, parks, and diversity, Jacobs suggests other tactics for revitalizing and preserving American cities. She argues for both subsidized housing and guaranteed rent, so that residents in projects are not forced to leave simply because they

begin earning more money. She encourages the "attrition of automobiles" by broadening sidewalks, improving public transit, reducing available parking, encouraging taxis, yet still allowing trucks in order to keep commerce flowing (338). Jacobs calls for visual order in cities through streets, landmarks, "eye-catchers," and "unifying devices" (388-389). She suggests a reintegration of the projects back into the city through unifying streets, outdoor vendors, stores on the first level of buildings, and getting eyes on the street (392). Finally, Jacobs sees the necessity of a restructured government and planning board in order to foster cooperation and community involvement.

Jacobs' influential book criticizes contemporary (and sadly sometimes current) Garden City and City Beautiful inspired practices of urban planning, suggests that the history and current state of actual American cities can teach us more about success and failure than any planning theory, and offers concrete tactics for solving the problems of our cities. Jacobs concludes with a seemingly obvious yet oft-forgotten statement: "Underlying the city planners' deep disrespect for their subject matter…lies a long-established misconception about the relationship of cities—and indeed of men—with the rest of nature. Human beings are, of course, a part of nature…The cities of human beings are…natural" (443).

Ian McHarg, in his breakthrough book *Design with Nature*, works directly out of this premise to propose, in concrete form, a new method of urban planning based on the idea of human ecosystems. McHarg also ties into Leopold's thesis about the land ethic, stating that "we have but one explicit model of the world and that is built upon economics" (25). What McHarg attempts to create is "a simple plan for man in nature" (1). He explains this simple plan through a series of case studies which he undertook both

as a professor at the University of Pennsylvania and as a landscape architect in his firm, Wallace-McHarg Associates.

McHarg begins with a study of coastal processes, revealing that Europeans have long been designing with nature in ways that people in the United States have yet to do. For example, Dutch dikes mimic the form and function of natural sand dunes, while planning on the New Jersey shore attempts to defy nature with concrete blocks, which always ultimately fail (7). While laying out the proper design for development on a sandbar, McHarg states what may be seen as his principle thesis: "the most reasonable approach would be to investigate the tolerance or intolerance of the various environments to human use in general and to some particular uses" (13). Thus, his later studies first delve into the natural history of a site before suggesting land use plans.

McHarg says that "any place is the sum of historical, physical and biological processes…these are dynamic…they constitute social values…each area has an intrinsic suitability for certain land uses and…certain areas lend themselves to multiple coexisting land uses" (104). Thus, whether studying the Valleys neighborhood outside Baltimore, planning the route of least social cost for a highway, suggesting a plan for the use of remaining space on Staten Island, or developing a plan for the gradual growth of the entire Potomac River Basin, McHarg intensively researched the natural history of each site before making recommendations.

In the process, McHarg created transparency maps of the various characteristics, from physiological to hydrological features, areas of cultural and social importance, protected areas and various ecosystems, recreation, and urbanization. For example, when laying out the hydrological features of a site, McHarg would first make individual maps

of the groundwater, areas of aquifer recharge, floodplains, tidal areas, rivers, streams, and other surface bodies, areas of low dissolved oxygen, sewage and pollution, soil runoff, acid mine drainage, low flow, and tropical storms. Coding the areas on each map to represent sensitivity to development, he would overlay these characteristic maps to form an overall picture of the hydrologic profile of the site. After following the same process with the other factors, he would overlay these composite maps, revealing the areas of highest and least social cost.

From these composite maps, McHarg could make recommendations about the best location for each suggested type of development, and could lobby for the protection or conservation of certain critical habitats. “The basis of the method is constant for all case studies—that nature is interacting process, a seamless web, that it is responsive to laws, that it constitutes a value system with intrinsic opportunities and constraints to human use” (34). Thus, McHarg incorporates even the social costs usually hidden in planning proposals. Summing up his theory, McHarg says that the method is “the search for the basis of the identity of a city, the selection of those elements—in the natural identity and that of the created city—that are expressive and valuable, that exercise constraints and that proffer opportunities for new development” (185).

At the same time, McHarg explores culturally-based visions of the world. He claims that the most damaging of these stems from the Abrahamic faiths: “The emergence of monotheism had as its corollary the rejection of nature” (26). He compares this worldview, based on the stewardship of Adam and Eve in the Garden of Eden, to Eastern religions, such as Shinto, Buddhism, and Tao, which focus more on the “harmony of man and nature” (29). McHarg claims that “in the traditional society of

Japan…the full integration of this view [that humanity and nature are indivisible] is revealed" (27). The western world, on the other hand, has evolved out of four distinct and nationalistic traditions.

The first tradition emerged during the Italian Renaissance. Through the celebration of humanism grew the idea of the "authority of man," which was expressed in the orderly, Euclidean geometry of Italian villas (71). Next came the era of French gardens, which again employed geometry as a symbol of order in the world, and in addition used ornamental plants rather than native ones. The third tradition is that of eighteenth century England, which, inspired by landscape painting, poetry, and literature, attempted to create a functional and productive space without imposed geometry. Though these English pleasure gardens revolved around native plants and communities in a way the other traditions did not, they completely rejected urban space and viewed domestication and usefulness as the goal of supposedly "wild" space. Finally, the Islam-inspired Spanish tradition of a paradise garden again drew on the ideas of stewardship in its design.

McHarg was both sensitive to history and visionary in his thought. He had an early sense of the watershed view which today is the common parlance for planning and environmental concerns. He was an early proponent of environmental legislation, arguing that if we understand our dependence on natural cycles, concern for the environment is no more than "intelligent self-interest" (55). His use of transparent overlay maps and his hope that computers would one day aid this process foreshadowed the development of GIS (Geographic Information Systems), which today is the most common tool among planners and workers in the environmental field. Finally, McHarg was among the first (if

not the first) to employ an ecosystem model when discussing human planning, describing it as “dominant or codominant land uses, coexisting with subordinate, but compatible ones” (128).

Spirn, Wilson, Cronon: Branching Out, Focusing In

Anne Whiston Spirn was directly influenced by the work of Ian McHarg, both by studying *Design with Nature* and by working with his firm. From this experience in ecologically-based planning, Spirn turned to work in community outreach, focusing on gardens, playgrounds, parks, and infrastructure improvement in urban environments. Her career thus bridges the two underlying themes in this project: urban ecology and community organizing. In her influential book *The Language of Landscape*, Spirn insists that humans and natural processes are partners in the creation of landscapes. “The language of landscape recovers the dynamic connection between place and those who dwell there” (17). Her first major publication, however, *The Granite Garden*, was one of the three books published in the early 1980s which drew on the ideas of McHarg, Jacobs, and Leopold to further develop the concept of urban ecology.

The Granite Garden draws on case studies to analyze the best and worst practices in urban environments in terms of air, land, water, plants and animals, and the city as an ecosystem. For each section, Spirn describes the history of urban use, the theory behind better use, and practical plans for the future of urban environments. Spirn explores urban ecosystems informed by the idea that thinking of the city as outside of nature has caused many of the environmental problems now facing cities (5).

Much like Leopold, Spirn views the Native American land ethic as one which "made little impact on the land" (15). Though she then traces the natural history of cities as diverse as Boston, Jerusalem, and the cities of Ancient Greece, Spirn sees common threads in all of them, both of cultures which learned to respect the limits imposed by natures and those which tried to surpass natural limits through technology (12). Like McHarg, Spirn is able to see the age-old human desire to incorporate nature into the dwelling space and thus into the urban environment (29).

Though it developed in response to human desire for a rural aesthetic in the dirty and depressing industrial landscapes, the Garden City failed to live up to its potential. Spirn, like Jacobs, criticizes the traditions of the Garden City aesthetic, which focused on the superficial rather than on underlying natural processes (32-34). For Spirn, proper urban development involves a perception of the city as part of the land system which includes rural, suburban, and urban areas, rather than as an imposition on the exurban, so-called "natural" landscape.

As Spirn discusses air, land, water, plants, and animals, she continually emphasizes the importance of viewing natural processes as systemic and not as isolated events. Air quality must involve both emissions control and city design to encourage filtration (61). Construction must take into account both natural hazards and the advantages of mineral resources and geological formations (92). Water management should encompass use, pollution, flooding, and drainage in one systemic view (130). Plants must serve both ecosystem and aesthetic needs, and can also be employed in air, water, and land management plans (172). Wildlife must both be managed to prevent harmful interactions and protected to support biodiversity (216).

At the end of each section of case studies and historical practices, Spirn lays out "A Plan for Every City," which describes the set of methods which urban planners, environmentalists, and citizens invested in the urban environment must follow in order to protect and preserve resources, maintain urban health, and plan for the future in a way which respects the systemic nature of urban ecosystems. Her book has thus been influential not only due to its comprehensive nature but because it offers practical advice based on case studies and scientific research.

Like all the authors who contributed to the development of urban ecology, E.O. Wilson struggles to place humans in the context of their natural environment and identify a conservation ethic. He defines biophilia as "the innate tendency to focus on life and lifelike processes" (1). Wilson views conservation as the most rational act of self-preservation, in that "to the degree that we come to understand other organisms, we will place a greater value on them, and on ourselves" (2). Thus the ultimate goal of his work is to increase knowledge about natural systems to the end of inspiring a sense of value and a desire to protect.

At the same time, Wilson claims that environmentalism is undergoing a shift in definition; it was an ethical question, one which asked what is right or wrong based on a belief structure, and is now an intellectual question, one which asks what is true and what is false based on data. Wilson believes that with enough information, environmentalism will again become an ethical issue (119). Ethical questions are preferable to intellectual questions because they are informed by values and morals, making them potentially both more risky and more valuable to us. Thus our task at the moment is to gather enough

information about the values of conservation in order to bring it to the level of ethics rather than academics.

Wilson claims that the conservation ethic, like all codes of ethics, "is not created whole from absolute premises but inductively, in the manner of common law, with the aid of case histories, by feeling and consensus (124). At the moment, modern conservation still rests on "surface ethics:" we preserve animals with whom we form close relationships, like dogs, or which look and act like us, like chimpanzees. Our conservation ethic must evolve to the point where we see the innate value in species which are not friendly or do not have human characteristics. Wilson asserts that "people will conserve land and species fiercely if they foresee a material gain for themselves, their kin, and their tribe. By this economic measure alone, the diversity of species is one of Earth's most important resources. It is also the least utilized" (131-132). Unlike Leopold, who argues that a conservation ethic must now move beyond economic benefit, Wilson stresses that "it would be to the direct economic advantage of most governments to invest more in the study of their own living resources" (136).

Though Wilson was more in support of wild spaces than a proponent of urban life, he recognizes the necessity of knowing as much as possible about a place and its inhabitants in order to live there successfully. He states that "nothing in the whole system makes sense until the natural history of the constituent species becomes known. The study of every kind of organism matters, everywhere in the world" (8). Wilson thinks that "biogeography can be made into a science," which suggests the multi-layered data sets involved in urban ecological studies (69). He also proposes that scholars bridge the gap between the sciences and the humanities because "until that fundamental divide is closed

or at least reconciled in some congenial manner, the relation between men and the living world will remain problematic" (49). Thus, Wilson encourages cooperation and collaboration across disciplines. He believes that when science and the humanities work in concert, each "will expand [its] reach and capability" (55).

Acknowledging the complexity of ecological studies, Wilson says that "the human relation to nature is…subtle and ambivalent" (12). At the same time, an ecological focus can raise the complexity of our perception to a more encompassing scale. Wilson lays out a hierarchy of time scales, from biochemical to organismic, to ecological, and reaching a zenith in evolutionary time (42-43). Thus, looking at life on an ecological scale allows us to include more individuals and interactions. However, we are limited in our ability to see and appreciate ecological time scales, and thus ambiguity enters into our conservation ethic (123).

Though Wilson does not himself view urban environments as best suited to human life, he understands the aesthetics of urban residents, which draw on what he sees as the primordial human aesthetic: to live on "open tree-studded land on prominences overlooking water" (110). He claims that "when people are confined to crowded cities or featureless land, they go to considerable lengths to recreate an intermediate terrain, something that can tentatively be called the savanna gestalt" (111).

Finally, Wilson clarifies the surface ethic and what might become a deeper ethic of environmentalism. A surface ethic is composed of "a healthful environment, the warmth of kinship, right-sounding moral strictures, sure-bet economic gain, and a string of nostalgia and sentiment" (138). This kind of relationship between humans and their environment is acceptable, but not ideal. According to Wilson, "the elements from which

a deep conservation ethic might be constructed include the impulses and biased forms of learning loosely classified as biophilia" (139). Though Wilson uses his own word for it, one can argue that biophilia is really what all these authors are talking about: a strong sense of the innate value of the natural world and a desire to define our human place within it.

William Cronon, in his book *Changes in the Land*, explores the differing land ethics held by European settlers and Native Americans, harking back to the observations of Aldo Leopold about the interaction of worldviews and ecological realities. Cronon views Native American and Colonial societies as two different ways of interacting with the land. However, he recognizes the difficulty of establishing historical boundaries when humans are included in the ecosystem. What Cronon proposes to do is to put nature into a historical context, thus putting humanity into the context of nature.

Cronon, like Leopold, admits that "[n]ot all the environmental changes which took place after European settlement were caused by it" (9). Some were simply the result of natural landscape dynamics, which can include the destruction of one ecosystem to give rise to a new one, and even the extinction of certain species. But, also like Leopold, he recognizes the commodity-based mindset of the settlers: "Seeing landscapes in terms of commodities meant something else as well: it treated members of an ecosystem as isolated and extractable units" (21). He also notes, however, that many colonists appreciated the diversity of the New England forests, which approached the levels of biodiversity found, in present days, only in a rainforest.

Cronon links the activities of the Native Americans and the European colonists with natural cycles when he discusses the effect of fire on the New England Landscape.

In an untouched forest, fires caused by lightning strikes take old trees out of the canopy, allowing for patch succession to occur. When suddenly confronted by an opening full of sunlight, species normally restricted to the lower canopy or kept from growing altogether may rise and fill these gaps. Native Americans observed this natural process and mimicked it in order to create cropland. European colonists observed the Native Americans and mimicked them both in order to create cropland and to clear paths for settlement. Thus, while the human-initiated fires certainly occurred more often and to a sometimes greater extent, the anthropological effects on the land were simply a continuation of natural occurrences.

Although human activity was copying a natural process, the human intellect was at the same time mentally restructuring the environment. "Whereas the natural ecosystem tended toward a patchwork of diverse communities arranged almost randomly on the landscape—its very continuity depending on that disorder—the human tendency was to systematize the patchwork and impose a more regular pattern on it. People sought to give their landscape a new purposefulness, often by simplifying its seemingly chaotic tangle" (33). Cronon recognizes the limited human capacity to observe order in nature and the natural human tendency to want to impose a simpler structure on a system they do not understand.

But this is exactly where the themes of urban ecology come into play. Ecology as a science deals primarily with the complexity of interrelated systems. Spanning from macro- to microscopic, covering all forms of organisms, encompassing chemistry, biology, geology, hydrology, physics, and systems theory, ecology is the science of the complicated. When the human element is added, on top of those sciences already listed,

one must take into account anthropology, sociology, pathology, demography, theology, philosophy, politics and economics, among others. Thus the field of urban ecology may be humanity's first attempt to truly deal with the raw complexity of the natural world and our place in it. Like in any science, models are made to simplify the data, to express it clearly, to prove points. Yet the types of data available and the possibilities for areas of study are myriad, which is what draws so many different types of scholars into the field of Urban Ecology, and creates such a dynamic science.

Platt, Berkowitz, Donahue: The Field and the Meadow

The field of urban ecology is now developing to the point where entire academic journals are devoted to it, conferences are held about it, major universities across the country teach courses on it, and edited collections of essays are being published. Two such books are *The Ecological City: Preserving and Restoring Urban Biodiversity*, edited by Rutherford Platt, and *Understanding Urban Ecosystems: A New Frontier for Science and Education*, edited by Alan Berkowitz. These two collections bring together authors from diverse backgrounds to focus on specific areas of urban ecology, address complicated problems, and suggest visions for the future of the field.

The Ecological City brings together landscape architects, planners, geologists, foresters, social scientists, ecologists, civil engineers, biologists, community organizers, educators, and an environmental psychologist to discuss emerging themes in the field. Nearly all the authors directly address the issue of public policy and grassroots action as foundations for change.

Understanding Urban Ecosystems arose from the eighth annual Cary Conference. Focusing on the issue of education, the authors discuss themes from public education reform to university structure, environmental justice, community development, history, planning, and a view of the future of urban ecology's role in education and planning in the United States.

At the same time that the field itself is developing, some scholars are using its principles to focus very specifically on an area of study. Brian Donahue is one of these scholars. Drawing on the layer-based thinking of Geographical Information Systems, the anthropological-ecology which is now becoming a popular theme and an inherent sense about the possibility of sustainable living, Donahuewrote *The Great Meadow*. In it, he confronts William Cronon's thesis, arguing that for a short period of time, a community of European settlers, with their inherited land ethic of commodification, did in fact manage to live in a sustainable relationship with their landscape.

Drawing on deeds, probated estates, and tax valuations, as well as his own experience of farming the land for over twenty years, Donahue studied the forty-five square mile area around Concord, Massachusetts, projecting back to show the changes which occurred from 1635 to 1673. His study grew out of his residence and work in the area and his curiosity about the stasis which prevailed during those mid-seventeenth century years. Donahue consciously ignores both women and wild/undomesticated animals in his study, choosing to focus on animal husbandry, which was the realm of men. His "contention is that colonial agriculture in Concord was an ecologically sustainable adaptation of English mixed husbandry to a new, challenging environment" (xv).

What Donahue found in his extensive research on Concord was that this period was “an unusual interlude in American agrarian history in which the tradition of sustainable husbandry was, for several generations at least, more powerful than the extractive drive” (xix). Here, Donahue is referring to the two traditions of land ethics, just as Leopold and Cronon do: one, Donahue characterizes as the market tradition, the other as one of understanding, skill, and restraint. But unlike Leopold and Cronon, Donahue recognizes that “these two drives have coexisted, in complex and changing tension, within the same people” (xix). Donahue’s study is not one comparing the indigenous land ethic to that of colonists; rather, he explores the conflicting tendencies within one society and diagrams the brief period of time in which the sustainable land ethic reigned.

Donahue’s central question is this: “could Concord’s system of husbandry, once established, continue to deliver the desired level of natural products and ecological services to its human inhabitants more or less indefinitely, or did it undermine itself?” (23) What Donahue discovers is that the general mindset toward the land changed as a result of market pressures and new economic opportunities. From a sustainable system of animal husbandry and subsistence farming, the later generations of Concord reverted to the mindset which viewed the land as a marketplace of extractable resources which could be sold for profit.

At the same time, Concord suffered under the pressures of demographic expansion, which required the conversion of forests and commons to private holdings and farmlands. The problem of this sort of expansion lay precisely in the lesson Donahue learned himself from his apple orchard: crops must be planted on appropriate soils. When population growth forces people to cultivate new lands, they will tend to take whatever is

available, rather than what is appropriate for a particular crop, and grow what is profitable, rather than the crop which is best suited to their soil. For those 38 years in which Concord existed sustainably, "[p]lowlands, orchards, meadows, pastures, and woodlands were for the most part placed precisely on appropriate soils, and once placed, stayed put" (229).

Connecting Themes: The Scope of this Project

Drawing on the more than fifty-year history of thought which has led to the establishment of urban ecology as a field, I will explore the ways in which the field is now put into practice by various community-based organizations. Through personal interviews with prominent scholars in the field of urban ecology and the executive directors of organizations working on issues of urban ecology, I will identify patterns of successful project management.

Through a comparison of the diverse approaches to urban planning, I will articulate the common set of important aspects to a planning technique which accounts for community interests and the ecology of the urban setting. These tools will be synthesized, grouped, and analyzed in order to present a holistic method of community-based urban ecological planning—a menu or toolkit for future projects.

TWO:

URBAN ECOLOGY IN PRACTICE

Having traced the history of Urban Ecology as a field, I will now describe the current state of organizations that work in the field. Covering cities nationwide, from diverse roots and with varying missions, these groups all touch on several of the themes addressed by the founding authors discussed in Part One. Through a series of personal and telephone interviews with directors and professionals, I learned the stories of these individuals and their respective organizations. Here, I will discuss the past and current efforts of each group. My purpose is to explain fully their methods and aims so that in the subsequent chapter, I can analyze their work in order to extract the essential elements of Urban Ecology in practice, with the goal of describing the aspects necessary to the foundation and successful maintenance of an Urban Ecology organization in the United States.

The experts I interviewed fall into three general categories. They are either associated with the Urban Ecology Collaborative (UEC), connected to a Long-Term Ecological Research project (LTER), or are a part of a localized, grassroots movement. In order to facilitate a comparison and analysis among these organizations, I will outline the mission and founding of each, its organizational structure, expertise and methods, its sources and methods of funding, and its partnerships in the community and nationwide.

The Urban Ecology Collaborative

Urban Ecology Institute

Mission and Founding

Charlie Lord is the Executive Director of the Urban Ecology Institute (UEI) in Newton, Massachusetts. When Lord finished law school in 1992, he received a grant to

start an environmental justice law center, which became ACE (Alternatives for Community and Environment) in Roxbury, one of the poorest neighborhoods in Boston. By 1997, Lord decided that ACE should be run directly by members of the community, so he moved to the board of directors and began to do consulting.

Lord met Eric Strauss, a professor of Biology at Boston College, who was already doing field-based learning on Cape Cod in addition to developing the Environmental Studies program at Boston College. Strauss was thus experienced in field research on such fields as animal behavior and ecology, as well as an accomplished teacher, having developed partnerships with local elementary and high schools in addition to working with college students. Through these partnerships, Strauss learned how to bring upper-level curricula to secondary and primary teachers and students and developed strong partnerships around Boston and Cape Cod. However, what Strauss really wanted was to be involved with work on the urban environment.

With Strauss' background in linking to schools and Lord's experience in networking with the Boston community, they began to think about developing a community-based organization under the emerging Urban Ecology approach. Thus, in 1998, Lord and Strauss launched the Urban Ecology Institute (UEI).

Organizational Structure and Methods

UEI is not a community-based organization but provides the link for community-based organizations and schools to academia and technical skills. Their expertise has expanded the services they can provide, such as law, ecology, geology, mapping, forestry, social science, and education

Currently, UEI divides its work into two main branches: Education and Natural Cities. The Education programs work with college and high school students as well as groups of all ages to foster environmental stewardship. From working with teachers to develop and implement environmental curricula, to running workshops, to holding the yearly Summer Institute, to supporting the courses in the Environmental Studies department at Boston College, the Education program relies on the integration of existing structures and new theories of education.

The Natural Cities program includes two branches: the Community Forestry Partnership and the Natural Cities projects. Community Forestry provides training, trees, and supplies to community groups after the model of URI (Urban Resources Initiative) in New Haven (see below). Also included in this project is the street tree inventory, which is an attempt to catalogue accurately all the street trees in Boston, using GIS maps and teams of volunteers. The Natural Cities projects are based on an in-progress manual which lays out the steps for a community to develop its own vision based on its individual goals and resources. From an analysis of the entire Charles River Watershed, the Natural Cities team has embarked on several more specific, community-based projects in the Boston area.

These projects are based on a process which involves three main branches: Ecology, Social Science, and Law. First, UEI staff and the community group create an overall ecological map of the area, highlighting open space, protected areas, zoning, and other important features. Then, UEI staff provide a model survey that volunteers then administer to the community in order to determine the areas of greatest concern and most perceived value. From the coincidence of these studies, a list of sites for potential study is

developed. Then, UEI's ecologist conducts Ecological Rapid Assessments, which evaluate species richness, connectivity, and the overall ecological health of each parcel. The next step involves Legal Rapid Assessments, which determines both the ownership and zoning history of the site as well as whether any particular federal, state, or local regulations apply to the site (such as watershed protection or easement laws). Out of these rapid assessments, UEI and the community can choose the sites on which to focus their limited resources and develop action plans for these sites. This may be the creation of an 'urban wild' park, the clean-up of a polluted water body, the reclamation of a shoreline as public space, or other possible developments which the community decides are desirable and are recommended by the technical experts at UEI.

Funding

Lord and Strauss found seed funding through contacts and friends in Boston as well as small foundation money.

Partnerships

Thus, UEI's reach extends over many disciplines and population groups, providing both technical and legal assistance as well as education and community development. Lord hopes that the work being done now by UEI may serve as a model to future programs in other cities. He hopes to share their educational programs, help to redesign cities through partnerships, and possibly form a national coalition. UEI is part of the Urban Ecology Collaborative (UEC), a network of professionals thatstates as its goal both the sharing of expertise and collaboration on projects. Lord hopes to see UEI take a leadership role in the UEC, helping to change the way cities are conceived. Other partners in the UEC include the Urban Resources Initiative (URI) in New Haven,

Connecticut, and the closely related Parks and People organization in Baltimore, Maryland.

Urban Resources Initiative

Mission and Founding

Colleen Murphy-Dunning is the Director of URI. Murphy-Dunning's work at URI in New Haven has been influential to nearly all the other organizations which I researched, particularly her work in community and urban forestry. Murphy-Dunning began her work with an MS in Forestry, working for a non-profit organization on international tropical forestry, particularly the impacts of natural resource extraction and logging. Her focus was on local populations and developing sustainable alternatives, such as using a portable mill rather than bulldozing logging roads in a tropical forest. Murphy-Dunning went to Kenya to teach in a forestry college. She taught agroforestry, which is the planting of fuel wood and crops into existing plots to protect the forest. Through her involvement with women's groups in Kenya, Murphy-Dunning began to see the impact of community development and community-based education.

Thus, when she joined the United States Forest Service research lab at Yale and found out about the open position for interim director of URI (Urban Resources Initiative), she took the job. URI was founded in 1989 by William Burch with Morgan Grove as its first intern (for more on Grove see p.32 below). URI had an early partnership with the Baltimore Parks Department, and each summer sent interns from Yale to Baltimore to work on their parks, and later with Parks and People (see p.27 below). By the time Murphy-Dunning joined URI in 1995, Yale had stopped sending interns as the Baltimore program had become self-sufficient.

Murphy-Dunning found that her work at URI was essentially the same as her work in Kenya. It was about helping a local population meet their natural resource needs. At the time, URI was not a formal non-profit, but a Yale initiative. They had established a partnership with the Housing Agency and a community foundation in New Haven, developing a Neighborhood Program, which included community gardens and beautification work in community green spaces. In 1991, out of a small tree planting, URI and its community partners decided to set up a non-profit that linked Yale's expertise to needs in the city of New Haven.

Organizational Structure and Methods

One of the goals of URI's community partnerships is civic capacity and engagement. Through the community gardens, URI works to identify the community's needs, goals, and skills, and then cooperates with community members in the development and implementation of a project plan. The following are the four main steps in the process. First, with the involvement of volunteers, URI conducts a biophysical assessment, planting on private property in poor areas where public space is unavailable and identifying planting priorities (such as shade trees, flowers, particular species). Next, in the design phase, URI provides the citizens with a range of species which are ecologically appropriate to the site, allowing them to pick what is planted based on aesthetics. URI then delivers the material and teaches the citizens how to properly install and maintain the plants. One year after the planting, URI checks in on the site, assessing the survival rate of the species.

A new facet in URI's work is legal advocacy, which grew out of a 2004 Open Space Convention. Because URI's focus is on technical support and education, advocacy

is unusual for them and not particularly within the range of their abilities. Thus, their goal with this new project is to teach citizens how to advocate for themselves for a legal mechanism to protect community-run open space. For example, in New York City, the city owns vacant lots, which have since been turned into community gardens. These gardens contributed to neighborhood development, and when property values rose, the city wanted to sell the lots. The community had to raise money to buy the space which they had been planting on for years. Although such action is not imminent in New Haven, it is a potential threat and certainly applies to larger cities like Boston.

Murphy-Dunning sees a clear distinction between northeastern/midwestern post-industrial cities and the growing cities of the west, south, and southwest. For example, in growing cities, a community forestry project is a likely indicator of high property values and richer people, while in the burnt-out centers of former industrial cities that have undergone significant population loss, a community forestry project is indicative of the poor community's reinvestment in the urban core. Murphy-Dunning cites a San Francisco community forestry project, which charges volunteers $100 per tree, which she claims would never work in New Haven. For the poor communities she works with, the trees must be free or they will not be planted. The focus of a non-profit involved with community forestry also changes based on leisure time. For people working multiple jobs in order to support their families, taking several hours a week to undergo training and plant trees is not necessarily feasible, and thus leisure time must be considered in an urban tree-planting project.

Funding

Currently, URI has an annual budget of $150,000, working partnerships with over 60 community groups, and is still funded by the same original partners.

Partnerships

Their early work, which was based on the expertise of each intern, informed their current methods, which match technical support to the community's capacity, and facilitates rather than dictates the process. URI's contribution is its institutional skills and knowledge, which comes out of the work of landscape architects. Many of the communities in which URI works are known as "Enterprise Zones," which means they meet a federal threshold for poverty. Thus, these communities are eligible to apply for federal funding for green space and beautification projects, which aids URI in its projects.

Finally, I asked Murphy-Dunning to reflect on the future of the Urban Ecology Collaborative (UEC). She claimed it is difficult to assess because the partnership is still in its infancy. Although she sees great potential for joint research across cities, the research working group is not yet functioning. The environmental education working group, on the other hand, is running an assessment and doing a great deal of planning. The restoration tools working group has exchanged models, and the information sharing among all working groups will increase once the proposed journal takes shape. According to Murphy-Dunning, each working group functions differently based on the kind of work they do, and she sees the greatest promise in the future of the research group.

Parks and People

Mission and Founding

Parks and People in Baltimore, MD, grew out of both a mayoral initiative to bring private capital into the Recreation and Parks Department as well as the interns sent down each year from URI at Yale. Thus, from 1989, citizens in Baltimore were working on forestry skills and networking with the city parks. Out of the community forestry project came a larger plan for revitalizing Baltimore, which is a ten-year partnership with the United States Forest Service. One of the goals of Parks and People is the improvement of urban water quality through tree planting, and its work depends heavily on the direction of the city Recreation and Parks Department, though Parks and People is an independent non-profit organization.

I interviewed Guy Hager, who has worked in urban planning for thirty years, mostly in the public sector. For the past seven years, he has worked with Parks and People on project management. The organization's focus is more on community planning than on environmental work. According to Hager, it uses "stewardship for the purpose of revitalizing inner city neighborhoods," looking at issues ranging from sanitation to housing to transportation.

Organizational Structure and Methods

The structure of Parks and People involves four different project headings. The Community Grants Program funds small grants for community members, some of whom have since incorporated as their own non-profits. Community Forestry, Watershed/Clean Water projects and Schoolyards, which involves asphalt removal and replanting, are the other three project areas. All the programs rely on partnerships for resources, skills, and better community outreach, working with city, state, and federal agencies as well as other non-profits and community groups. The Parks and People approach is to broker city

services for groups who struggle with access to city resources, though, on occasion, it does act as a catalyst, proposing ideas to an existing group.

When looking at a project to engage in, Parks and People uses its grants review group to ensure that it works with diverse and different organizations. Next, the organization conducts a community readiness evaluation, testing the partner organization's development in an attempt to refine its methods. Parks and People also bases its decision on prior knowledge and experience of a group. It tries not to give too much money in order to size each project appropriately to the organization's capacity and structure. Its hope is to allow the group to be successful on a small scale and then grow, which is why it renews grants on a regular basis.

Hager says that Parks and People always includes research, education and skills-building in its projects. Hager says he is "trying to…create a learning organization." Part of this process is building institutional knowledge, such as that which is shared by the UEC. Specifically to Baltimore, Parks and People uses a blanket, city-wide approach combined with targeted, focused efforts in specific areas, with the goal of "revitalizing inner-city neighborhoods."

Parks and People's model project, Watershed 263, started nearly in 2003 as a study of water quality in storm drains, pipe systems, and below-ground streams in eleven neighborhoods, covering over 900 acres. This partnership started with the Department of Public Works, the Baltimore Long Term Ecological Research project (see below) and the United States Forest Service, but now involves over 45 community organizations and 20 partners. Watershed 263 addresses issues ranging from environmental health to sanitation, youth and education, recreation, housing, planning, and transportation.

Parks and People set out to develop a six to ten year process to green neighborhoods systematically and to be able to measure improved water quality and quality of life. It had already been involved in some of the neighborhoods, and thus acted as a catalyzing force to motivate individuals and groups to join on to the Watershed 263 project. By focusing on the improved quality of life which is a possible result, Parks and People created a common interest for members of diverse communities. Although the neighborhoods of Watershed 263 are also dealing with pressing social problems such as unemployment, illiteracy, and lack of resources, many members of these communities are concerned about the environment.

One way to garner support is to show the tangible benefits of an improvement in water quality. For example, Hager says that greening vacant spaces can remove drug dealers and reduce crime, and that improvements in air and water quality will improve health and reduce heat. In addition, wetlands and wildlife preserves provide recreational and aesthetic resources for the community.

The first step in the Watershed 263 process was to approach community leaders. They identified problems and concerns in their areas, and Parks and People worked with them to think about solutions to these problems. Then a planning session with twenty of these leaders was held, at which they planned a series of community-wide forums. Together, Parks and People and their partners hold at least two per year, though there may be as many as six in 2005. At these forums, current progress and future plans are discussed and modified with the input of the entire community.

When asked how he makes sure these forums are representative of the entire community, Hager said that he not only holds multiple forums, but invites different

organizations and actively solicits participation. He achieves this through telephone surveys, self-return mail surveys, and face to face interviews.

Baltimore has over 355 storm drain watersheds, so this project may serve as a model for the other watersheds, which is currently true of organizations working on four other Baltimore watersheds. The hope is that by replicating Watershed 263 in other areas, Parks and People and its partners may be able to positively impact the water quality of the Chesapeake Bay as a whole. However, Hager makes it clear that it is more important to learn than to succeed. Though an eventual goal is overall environmental improvement, at this time, he would rather be able to measure the outcomes of the project than attain a significant improvement in water quality.

Parks and People conducts regular trainings which are free, open to the public, and practical. These trainings fall into five categories. The first is based on the organization's Neighborhood Open Space Manual, which is much like UEI's Natural Cities Program Manual. This training helps a group identify their vision and project ideas, elect a core team, divide responsibilities, plan and design, identify necessary materials and tools, mobilize volunteers, and establish a maintenance system. The second type of training helps groups learn how to successfully apply for and use a grant. The third is a cooperative extension, which is a joint training with other groups. Another training, which can be ongoing over one to two years, involves constituent building. Finally, there are specialty trainings, which can be in anything from soil analysis to tree planting and pruning to community organizing.

Funding

Hager discussed the funding of Parks and People, a crucial element in any non-profit organization's long-term viability. The key to its success has been soliciting funding from diverse sources, which include the federal government, competitive and merit grants, earmarks in congressional bills, and state money. In addition, the organization solicits individual contributions and holds fundraisers. Currently, Parks and People is trying to create revenue-generating businesses to support the non-profit, including a tree nursery specializing in urban street trees, the sale of wood waste, and greenhouses.

Urban Ecology Collaborative: Summary

In summary, the Urban Ecology Collaborative, while still in its infancy, may provide a crucial informational link among both established and emerging organizations, by allowing professionals to share methods of community organizing, partnerships with other organizations and with bureaucratic agencies, funding, and scientific methods. At the point at which UEC grows to more fully moderate this exchange of information, it may be unnecessary for a new non-profit to go through the trial and error phase of urban ecological work, because for each potential goal, whether it is community forestry, community organizing, watershed health, or urban revitalization, a set of successful methods will already be available for tailoring to the specific site.

Long-Term Ecological Research

The National Science Foundation has taken proposals for Long-Term Ecological Research (LTER) projects around the country. Morgan Grove both works closely with UEC and with the Baltimore LTER team. I interviewed him both about his work in

Baltimore and his ideas about Urban Ecology as a larger field. Laura Musacchio is on the planning team for the Central Arizona-Phoenix LTER (CAP LTER). I interviewed her about her research and its connection to larger themes.

Morgan Grove

Morgan Grove began his training in architecture and environmental studies, moving on to a Master's degree in community forestry. However, he, like Murphy-Dunning, focused on rural, not urban areas, and particularly on rural areas in developing countries. During his time at Yale, Grove looked for a way to link natural resource management to the prosperity of the communities in which he worked. He began to network to the people in Baltimore (groups which later evolved into Parks and People), who helped to change his focus to urban areas in the United States. When he was sent from Yale to Baltimore to help establish a long-term plan, Grove drew on his architectural training and the institutionalization of natural resources and community development literature produced by URI.

Drawing on his rural forestry work, Grove looked at each neighborhood in the city as a small village, and thus modified the technique of rapid rural appraisal to a useful method of rapid urban appraisal. For example, Grove claims that one can determine a neighborhood's wealth by looking at its roofing materials: rich areas will have slate, while poor areas will have tarpaper. Other household characteristics are necessary to accurately define a neighborhood, such as the type of house, family composition, and life stage. Grove was encouraged by the wealth of data available in U.S. urban areas as opposed to in international rural areas. However, it is expensive to accurately collect

biophysical data in any setting. Thus, he looked for ways to engage the community in order to best focus limited resources.

Grove has found that market analysis can provide information on likely social and biophysical problems, the capacity for collective action, and the best methods for marketing to or communicating with people. He insists that it is vital to know one's audience, because it is not enough to be right and tell the truth, one must be convincing. Market research can provide leverage points within the community whether for internal communication or networking. In addition, analyzing modes of consumption can reveal social groups, whose lifestyle choices, patterns, and behaviors may be indicative of the group's environmental behaviors.

Once marketing research is complete, Grove looks at each neighborhood in its social, temporal, and spatial context. He thinks of each city as a process, located at a particular point in its history. Thus, changes in land use over time are particularly interesting and can inform the decision over whether the goal is conservation of an existing resource or restoration of one which has been degraded or destroyed.

Finally, unlike historical environmental authors such as Leopold and Wilson, Grove does not rest all of his hope for the future in environmental education. In fact, he believes that it may decline in popularity, but that will not signal the doom of the environmental movement. Rather, according to Grove, personal relationships, recreation, and multi-generational use are more important than environmental education for creating a person who cares about the environment. Thus, a child who is both involved in the design of a community green space and plays in it with both parents and grandparents is

more likely to feel a personal connection to her urban environment than a student who simply learns about conservation in the classroom.

Central Arizona-Phoenix Long Term Ecological Research

Mission, Founding and Funding

One of the sources of the wealth of data which Grove cited as so essential to urban projects is the Long Term Ecological Research funded by the National Science Foundation. I interview Laura Musacchio, who works on the planning team for the Central Arizona-Phoenix LTER (CAP LTER). Though she started in biology, Musacchio got both a Bachelor's and a Master's degree in landscape architecture, moving on to a Ph.D. in urban and regional science. While working for Arizona State University as an assistant professor in the School of Planning and Landscape Architecture along with the Center for Environmental Studies' International Institute for Sustainability, she learned about the recent call for proposals for urban LTERs. Phoenix, as a rapidly growing city, appeared to be a unique study site for this kind of longitudinal and multi-disciplinary research. Nancy Grimm and Chuck Redman, the co-directors, organized the researchers into project teams around traditional topic areas, but in the current renewal process are looking to link the areas through GIS studies and long-term monitoring. The diverse experts involved in the CAP LTER allow for interdisciplinary work between the social and natural sciences.

Organizational Structure and Methods

Each individual researcher asks her own research questions, but these tie into larger LTER questions such as: How rapid is the growth of Phoenix? How does one build knowledge about a changing ecosystem? What kinds of land use decisions are being

made? What are their effects? What is the role of individual landowners? How much planning and design goes into these decisions? Thus, a common set of variable occurs across the different studies, and while difficult, the integration of study goals and results is better now than when the LTER first started.

Musacchio deals with the changing landscapes of urban rivers, bringing planners, designers, and managers into the discussion. She looks, in particular, at recreational use and impervious surfaces. Her current project is a partnership with the Flood Control Agency of Maricopa County, which studies two different river corridors. Each affected city has its own goals, but the process which she uses is the same. She interviews stakeholders, such as local, state, and federal government agencies, irrigation agencies, consultants, public utilities, landholders (including gravel and sand mining companies), developers, property owners (representing residents), transportation authorities, and farming groups. These stakeholders attend meetings which discuss goals, plans, and their impacts. In addition, workshops allow for public input into the decision making process. Musacchio's interest is how, with such a diverse group of stakeholders, decisions are made about an urban riverway.

Partnerships

Musacchio's project is just one of many underway in the CAP LTER. She believes that the long-term monitoring of these various projects, which range across many disciplines, will inform both ecological and social theory. The public will benefit as policy makers learn from the results of the studies, and while some studies are simply for the sake of science, others will relate to public education and prediction. Thus, while the environmental effects studied will be specific to the Phoenix area, the general

principles discovered in the CAP studies will be applicable to other sties, particularly in planning and organizational behavior. This is true of all the LTER sites currently underway across the nation, meaning that over the next few years, a wealth of data about decision-making in urban ecosystems will become available for general use.

From the Grassroots

Organizations outside the UEC have sprung up around highly localized issues. I interviewed professionals in Washington, D.C., Pittsburgh, PA, Milwaukee, WI, and Oakland, CA. Each group has a different mission, employs diverse methods, and has grown out of an interesting organizational history. I interviewed Josh Burch of the Shaw Eco-Village in Washington, Marijke Hecht of the Nine Mile Run Watershed Association in Pittsburgh, Ken Leinbach of Milwaukee's Urban Ecology Center, and Diana Williams of Urban Ecology in Oakland.

Shaw Eco Village

Mission and Founding

Josh Burch, the program director of the Eco Design Corps at the Shaw Eco Village in Washington, DC, says that the goal of his organization is youth development, not environmental improvement. However, the methods used in youth development at the Shaw Eco Village enormously benefit the local urban environment. Burch, a native of DC, studied urban affairs and teaching in college before joining the Peace Corps in Ghana to work on community organizing. After returning to the country, he worked with an organization called Youth Build, which trains out-of-school youth to do construction as well as prepare for the GED and job readiness. Through that organization, the last house he built was done with entirely green materials, which got him thinking about the

link between youth development and environmental concern. Thus, when he met the director of the Shaw Eco Village, he signed on for the job of program director.

Organizational Structure and Methods

In partnership with teachers and students at the five local high schools, the Shaw Eco Village takes applicants for its school year and summer programs. During the year, the youth receive a stipend, which during the summer is paid by the DC city government. Students can join on to one of six project types, which are: clean land, air and water, community pride and identity, equitable development, health and wellness, public space, and transportation. Each project always involves a partnership with another non-profit for additional support.

For example, a recent equitable development project involved a youth survey, which revealed that the youth were worried that they would not be able to get a job in their neighborhood or afford to live there upon graduation from high school. Another project took a homelessness survey and then produced plays and skits to educate other youth about homelessness in the Shaw community. Under a health and wellness project, kids decided that the best way to create a healthy space on an empty lot was to plant a vegetable garden. Thus, with some direction from a team leader (usually a recent college graduate), the youth plan, design, and execute the projects themselves.

Currently Burch is overseeing five projects. There are three after-school programs (one works on homelessness, another on a community garden, a third on a rain barrel program); on Fridays, students from a local charter school work on bicycle advocacy; and one individual project is looking to get a DC government grant for a rain garden,

planning the specifics with a local architect. The rain garden will become a full project with a five person team this summer.

While it is apparent that most of the projects have an environmental focus, the goal of each project is not on measurable environmental improvement, but on the success of each individual youth. Burch has found that the students draw on community resources they did not even know existed, which helps to make them catalysts for sustainable change. For each project, Burch presents the method he calls "TEAM UP," which stands for Team building, Exploring community issues, an Action plan, Mobilization, Understanding, and Presentation. Each step in the process not only refines the project for the youth participants, but allows them to gain important job and professional skills, such as giving a formal presentation to project partners.

Funding

The funding from the Shaw Eco Village, as with Parks and People in Baltimore, comes from a variety of sources. These include grants, government funding, private donations, and a revenue-generating business. This latest development is Chain Reaction, a bike shop where the youth can work to repair and refurbish used bikes for sale to the community, and ties in with the bike advocacy projects in which other youth are engaged.

Partnerships

The Shaw Eco Village started in 1998 as a collaboration of the National Building Museum, City Vision and the Design Apprenticeship Program. The Shaw community wanted an opportunity for high school students in their area. With the help of architects, community organizers, and museum workers, a summer program for high school students

developed, which has since grown into a full school year program as well as a summer program.

Nine Mile Run Watershed Association

Mission and Founding

Both Marijke Hecht of the Nine Mile Run Watershed Association in Pittsburgh and Ken Leinbach of Milwaukee's Urban Ecology Center joined onto a young organization with essentially no staff and guided the process of developing it into a successful, fully staffed, and well-funded non-profit. Hecht, who is trained in nutritional anthropology and botany, joined the Nine Mile Run Watershed Association in 2002, a year after it had incorporated. She was the first and only staff member at that time, working under the existing board of directors. She partnered with the Studio for Creative Inquiry at Carnegie Mellon University, which is a think tank for artists to take on scientific projects.

From the late 1990s, the Nine Mile Run Greenway had been in conflict between the city and the community. The city wanted to culvert the stream, but when the community objected to the loss of its only body of water, the city hired scientists to study the value and potential of the stream. After agreeing not to culvert the stream the city gave $3 million, combined with a $5 million federal grant for stream restoration. Hecht joined onto the project at this point in order to expand the focus to the entire watershed. Though an analysis of storm water management was done, design plans and community involvement were necessary next steps.

Thus, Hecht held a design charette and public events, read the studies produced in the early research, raised funds, took on interns, hired a program coordinator and began

to do more outreach. Her mission is to involve citizens in restoration and protection efforts, so the goal is two-pronged: both community involvement and environmental improvement. Hecht hopes to create a forum for education, advocacy, and stewardship through her work on the watershed.

Organizational Structure and Methods

Education was one of the earliest components of Hecht's work at Nine Mile Run. In the first phases of the project, nature walks and bike rides were a big part of getting the community involved. Still ongoing, these walks help people notice new things and get them talking about the natural resources of their neighborhood. Now Hecht and her colleagues also give presentations and lead walks for schools, colleges, and clubs. In addition, there is an ongoing workshop called "Framing Your Environment" which works with the local Boys and Girls Club to encourage nature photography among youth. However, the neighborhoods of Nine Mile Run have an interestingly diverse population which requires that education extend beyond school-age children to adults and community groups.

The second goal, advocacy, comes out of the fact that the stream restoration is actually federally funded and managed by the Army Corps of Engineers. Thus, Hecht must continually push the Corps to work towards the preset restoration goals, and must also advocate for better funding. For example, Hecht is currently working on the Regent Square Gateway Project, which is a residential and stream interface in a city park. Next to it are a dilapidated parking lot and an old building. Because of storm water issues in this area as well as aesthetic and recreational needs, Hecht is fundraising for a better design of the space. She held a series of design charettes for the area but now wants a better, more

practical design. The area is complicated by ownership issues, as it lies at the intersection of several neighborhoods. Thus, Hecht is holding both stakeholder and public meetings in order to draw up new schematics, and is working to push the landowners to move ahead with the design.

Stewardship is the third goal of Nine Mile Run's work, and it falls into three main projects. The first is the Urban Eco Stewards, which trains people to identify and manage invasive species, and encourages them to apply their knowledge to their own yards. Hecht hopes to replicate this project in all major city parks in Pittsburgh. The second project is the Rain Barrel Program which conducts phone surveys and uses student volunteers to do neighborhood canvassing. This program provides free rain barrel installations, of which 500 are complete, conducts a follow-up survey, and will do workshops and give out barrels to community groups.

The third project is called Green Links, which focuses on blocks and neighborhoods and is based on Colleen Murphy-Dunning's Green Space Program in New Haven. Green Links looks at beautification and blight, holds monthly meetings with community members, gives out applications for tree plantings, plants and maintains trees, and looks at vacant lots and neighborhood parks for green space redevelopment. Hecht believes that both Green Links and the Rain Barrel program are replicable in any neighborhood, whether in Pittsburgh or nationwide. Her struggle is with a slow-moving population which is reluctant to change.

Partnerships

However, Hecht is motivated by the fact that there is no other open water in Pittsburgh with the same potential as Nine Mile Run and that it is currently the largest

stream restoration project in the country. Finally, she has been operating on annual work plans and only one-year strategic plans, but is currently developing a three- to five-year strategic plan, which she hopes to share with the UEC, with which she is heavily engaged in information sharing.

Urban Ecology Center

Mission and Founding

Ken Leinbach of Milwaukee's Urban Ecology Center had a similar experience to Marijke Hecht in joining an organization as its only staff member and developing it into a thriving non-profit. Out of his studies in Biology, Leinbach became a teacher with an environmental studies focus to a large, public urban school in Arlington, VA. The school owned 200 acres of open space and Leinbach was charged with developing an outdoor classroom/laboratory. Though he had no training in such an endeavor, Leinbach used common sense and his teaching experience to develop a functional nature-based tool for education.

After moving to Milwaukee, Leinbach completed a Master's in environmental education and through his coursework realized that, as he puts it, "the world is in crisis." He began to question what environmentally-aware citizens must do, how to help people change their behavior, wondering how people with the same level of education can act so differently. Drawing on the teachings of the founders of the field, he asked: "how does someone come upon an environmental ethic?" What Leinbach decided, what became his vision, was that he needed to "institutionalize environmental education [so that it] may have an impact."

Thus, when he found that the Riverside Park Nature Center was failing and needed revitalization, he signed on as the first paid employee with the job of salvaging the organization. The philosophical foundation of Leinbach's work was "significant life experience" research which reveals drivers for creating an environmental ethic. For example, consistent contact with natural land from an early age combined with a mentor who has demonstrated positive behavior towards the land can combine to produce an environmentally-conscious individual who demonstrates her commitment to stewardship in her everyday behaviors.

At the same time, Riverside Park, the locale of the nature center and located behind a large public high school, was the focus of a grassroots effort, stemming from the late 1980s, to save a natural area with a history of rapes, murders, drugs, and homelessness from the threat of crime, as well as pollution and development (the city of Milwaukee wanted to build condominiums in an effort to stop the crime). The city government first presented the idea of reclamation and with media coverage gained the attention of the neighborhood. Citizens began calling their representatives and holding community meetings, which by 1990 evolved into a working group to find a better solution than residential development. In 1991 this working group became the Friends of Riverside Park, which incorporated in 1993. The small nature center building was constructed in 1994 and Leinbach joined on in 1998.

Organizational Structure and Methods

Leinbach found that traditional nature centers market to teachers, provide brief environmental awareness to youth through field trips or encounters once or twice a year, and are highly dependent on the teacher's proclivity, such that two students in the same

school may have wildly different experiences of nature based on the teacher they happen to draw. What Leinbach wanted was an institutionalized program which would guarantee exposure for all students. Thus, he developed a neighborhood environmental education project, which expanded the non-profit from tiny to big, maximized exposure to nature, and nurtured mentoring, according to the tenets of significant life experience research.

In his first year, he worked on vocalizing his vision, finding money, and running some school programs. Through a meeting with local principals, Leinbach discovered that one common goal was for students to develop a sense of place and a connection to local geography. What they needed to work out was money, transportation, and curriculum connections. Thus, Leinbach borrowed vans, charged a small fee to each school (which could be partially defrayed by a business sponsor), and hired an educational director to tie the lessons into grade-specific standards of learning. The demand quickly grew until twelve schools were participating in the center's programs.

At that point, the only limitation was space, as Leinbach had a waiting list of schools that wanted to participate. He conducted a fundraiser which successfully brought in $5 million, allowing them to build the new, larger center, hire seventeen staff, and support 250 volunteers. Currently, the Urban Ecology Center serves 22 schools and still has more on a waiting list. Their programs include workshops, lectures, outdoor adventures, and job training. According to Leinbach, their "secret has been [their] connection to the community."

For every decision in the process of designing and building the new center, Leinbach and his team obeyed a series of filters. Does this proposal fit in our budget? Does it fit our programmatic needs? Does it align with our politics? Is it aesthetically

pleasing? Does it use green technologies? Will it fit in our time frame? Thus, they developed a beautiful and environmentally-friendly structure which serves the needs of their growing operation and functions as a resource for the entire community.

Funding

The Friends of Riverside Park and Leinbach both agreed that it was essential to teach city kids in their own environment, not in suburban nature centers, which were the only available environmental education centers at the time. But with a one-room center, a fragile infrastructure and a financial crisis, Leinbach had to work quickly to ensure the future of his and the community's vision. Luckily, he found one big-name donor, the Petit Foundation, a local, well-known family philanthropic foundation. Having this name signed on to the project made it easier for Leinbach to secure other donors and to begin working on the future of the center.

Partnerships

Leinbach's new goal is to establish a 20 year longitudinal study of whether environmental stewardship education works by following students who were and were not exposed to the center and studying their later lifestyle behaviors. At the same time, he wants to establish satellite sites around the city of Milwaukee in order to better serve students in their particular neighborhoods. He believes he could teach another city how to do what he has done, because "it is infinitely replicable." As of 2005, he is in the process of writing a working document of the model, though he claims "you're not a model until you've been replicated." Thus, at the point at which he can detail the steps he has gone through to creating a successful environmental education center which also protects a

valuable urban park, Leinbach's work could serve as a model for other cities across the country.

Urban Ecology-Oakland

Mission and Founding

Finally, I interviewed Diana Williams, the Executive Director of Urban Ecology in Oakland, CA. Though the name suggests that her work would be quite similar to the other organizations I studied, Urban Ecology actually focuses more on community-based decision making than on environmental health and is informed by their particular expertise, which is in land use and architecture. However, though their goals may differ, Urban Ecology functions in much the same ways as the other groups I spoke with, and as the only west-coast participant in the study, offers a different perspective on urban ecology.

Urban Ecology in Oakland currently focuses on specific neighborhoods and is influenced by the Smart Growth movement which encourages mixed-use planning and public transit. Their past work had more of an ecological focus, which included daylighting creeks.

Organizational Structure and Methods

Due to a leadership shift from 1975 to 1995, their work is now guided by the expertise of the staff rather than the interests of the board, and because the staff is trained in land use, architecture, and community development, Urban Ecology now designs its projects around these issues. In 1996, they published the "Blueprint for a Sustainable Bay Area" which was a breakthrough document in looking at a regional land use plan for a growing city.

Urban Ecology hosts a series of three workshops in order to develop a Neighborhood Plan and Action Steps for that plan. The first workshop functions like a typical design charette, in which participants are free to talk about their vision for their neighborhood, though Urban Ecology will guide the conversation based on their knowledge of the issues at hand. After this conversation, Urban Ecology will research to find money for part of the design process, whether that is to fund façade improvement or small business development. They work closely with the city of Oakland's economic development agency and the city councilperson's chief of staff. Williams claims that in the atmosphere of the Bay Area, politicians are already aware and supportive of community revitalization. Other partners may include community design centers in the planning and architecture schools of area universities.

The last step in the process is to turn over the action plan which Urban Ecology has developed based on the needs and interests of the community. Between workshops, they work on training community members, encouraging them to be involved in the research phase in order to establish a sense of ownership about the project. Currently, Urban Ecology is experimenting with parks and schoolyards as well as taking on one large development project, which is 23rd Avenue. This project involves two main parts, the first of which is the revitalization of the streets and sidewalks, making them more pedestrian friendly. Urban Ecology has proposed pedestrian signals such that no cars may pass, crossing guards for school children, lighting, planters, banners, trashcans, street tree planting, a transit complex for busses to stop, highly visible crosswalks, and a "bulb out" shape to the sidewalks to making crossing easier. Finally, they hope to establish a "place feel" by unifying the building materials and design. The second part of the project is an

anchor strip with a healthy business that a lot of people would use. Urban Ecology hopes to turn a vacant building into a community cultural center that can function as a space for art groups, who could pool rent and resources to support the space.

Thus, while Williams focuses more on design and architecture than on ecological health, the methods which she uses are crucial in any non-profit's link to community organizing and in many cases improve the neighborhood's green space. The street trees, planters, traffic control, pedestrian friendliness, and sense of place can all contribute to a better sense of connection to one's environment in depressed neighborhoods as well as an improved overall environmental quality, even though those are not the specific goals of Urban Ecology in Oakland.

Partnerships

Williams discussed the importance of community partnerships to the success of her organization's work, which includes working with the Trust for Public Land and small "Friends of X Creek" types of organizations. Most often, when entering into a new project, Urban Ecology is invited by grassroots groups who want to do something about a specific problem, whether that is crime, traffic, pollution, or any other number of community issues. In general, the communities with which Williams works are low-capacity areas whose citizens are not well-educated. Thus it is important to represent different perspectives on similar issues to show people the trade-offs that may occur. Though Williams works to reach out to different groups, the design process ends up having self-selected members.

Connections

Though my subjects ranged from scientists to community organizers, their missions ranged from youth empowerment to watershed conservation, and their organizational structure differed from a loose amalgam of researchers to a tightly knit group of employees and volunteers, the vision of each interviewee promised hope for the future of Urban Ecology. In the next chapter, *A Synthesis of Methods*, I will analyze the connections and disparities among these organizations in order to describe a fundamental model for the successful practice of Urban Ecology in the United States.

THREE:

A SYNTHESIS OF METHODS

Having described the work currently being done by various Urban Ecology organizations across the country, I now turn to an analysis of their methods and goals. By analyzing the story of the organization's founding, its mission, organizational structure and methods, funding, and partnerships, I will extract several essential aspects of any effort in the field. Finally, I will use this data analysis to describe a hypothetical Urban Ecology organization. If I were to start such a practice in a city which had never before seen anything like it, what would it look like? What would I need in order to be successful? My hope is that this may serve as a model or framework in the developing field of Urban Ecology, reducing the guesswork or trial and error phase that many of the current organizations have had to pass through in order to reach a level of stability and success.

Mission and Founding

No single model dictates a plan for the successful foundation of an Urban Ecology organization. Each story reveals the winding path of individuals in their own intellectual journey coming across an opportunity to apply their individual skills and passions to a worthy cause. However, one can extract lessons from the varying missions of the organizations studied.

The mission statements of these organizations varied from citing community organizing to youth development to environmental education to healthier streams. While these goals varied, they all tie in to one overarching theme: making life better. One of the clear messages from each organization's history is that an external body cannot enter a community and tell its members what to do to improve their quality of life, but must

listen carefully to the stories, needs, hopes, and complaints of the community members in order to help them accomplish what they already know they need.

Thus, whether the goal for the moment is youth empowerment, scientific inquiry, or planting trees, all organizations in the field of Urban Ecology make community involvement a priority. Lasting change is unlikely to arise from the implementation of a pre-formulated idea about what a healthy neighborhood looks like, but rather from within the existing neighborhood and its own vision of health.

Organizational Structure and Methods

While it is impossible to state that a successful Urban Ecology non-profit must have X employees and Y volunteers in Z departments, patterns of successful organizational structure are clear. A non-profit cannot function with a Board of Directors and a mission alone: as the Nine Mile Run Watershed Association and the Urban Ecology Center in Milwaukee both found, skilled staff are essential. With the combined efforts of a Board, senior staff, and volunteers or interns, an emerging organization can take shape. However, once the group's mission and goals are set forth, further organizational development can then take place.

When looking at the mission of the group, the necessary technical expertise must be secured, and the group determine whether this expertise is required on a regular basis or could be contracted out to a consultant. Does the group require an expert in Geographical Information Systems? Curriculum development? An ecologist? The profile of the permanent staff will evolve over time, as the group takes on new projects with new partners. The important lesson is to determine the initial technical needs so that the

mission and capabilities are in line. No organization wants to promise free landscape architecture services to a community group only to discover that they have no landscape architect on staff.

Once the staff is in place, the group should outline methods for accomplishing the organizational goals. As learned by Ken Leinbach in Milwaukee and Josh Burch in Washington, D.C., one useful tool can be to decide in advance on a series of filters or processes through which each project is passed. If the proposal fits into the terms set out, then the group will undertake the project; otherwise, the work may distract the group from its mission or dilute its capabilities. In addition, it is essential to build upon the shared foundation of Urban Ecology when formulating methods for action. Though Urban Ecology is a new field and innovation is expected, a group's work should have some scientific, academic or practical basis. In the experience of those scholars interviewed, this basis can come from staff's past employment, the use of work of other organizations, or the study of influential books in Urban Ecology.

Funding

The clear lesson from all subjects studied is that any successful non-profit organization must secure funding from a variety of sources. Both the Urban Ecology Institute and Milwaukee's Urban Ecology Center managed to obtain backing from a family foundation, which can be helpful in attracting other donors. Regular fundraisers are a key tactic in obtaining small, personal donations. Competitive grants and federal money can both provide strong support. One of the more innovative methods of financial backing is an adjunct for profit business which supports the non-profit branch of the

organization. The Shaw Eco Village created Chain Reactions, its bicycle shop, and Parks and People has a tree nursery. These kinds of businesses can provide not only a funding source for the non-profit but a potential job-training resource for community members involved with projects in the non-profit branch.

Partnerships

Urban Ecology as a field is based on connections; thus, any viable urban ecology organization must rely on partnerships on many levels. In addition to financial support, partnerships with community groups, government agencies on the local, state, and federal level, and national and international collaborating bodies provide networks of intellectual and technical support. A small non-profit organization cannot expect to fulfill all of its needs in-house, but occasionally will have to turn to its connections and build partnerships across the field for support.

The Urban Ecology Collaborative is an example of how organizations can create a loose affiliation to share information. Though in its infancy, UEC shows great promise for linking groups with diverse missions to one another. On this model, other collaborative efforts could arise which help to strengthen the link among organizations and encourage the flow of models, case studies, and advice.

On a more local level, organizations thathope to make local change will need to rely on community partnerships. Whether through holding open-to-the-public design charettes, (e.g., Urban Ecology-Oakland), offering free training, (e.g., Parks and People), sending volunteers out on door-to-door campaigns, (e.g., the Nine Mile Run Watershed

Association), or simply inviting existing community groups to their meetings, every organization studied relied heavily on community partnerships.

Summary: An Organizational Model

Both the spirit and the specifics of the nine projects described in Part Two inform a general model for the successful practice of Urban Ecology. One essential principle is to allow local circumstances to guide the development of the organization, while drawing on the experience of those who have gone before.

First, the mission and founding of an Urban Ecology organization must draw on the local history of the city: are there particular environmental concerns, such as a riverway or urban park? Have community groups been working to protect an open space? Do youth development, job training, or community organizing groups already exist? What is the state of public education and its ties to community groups? Does the local government have a department or initiative for ecological improvement or protection? By reflecting on community history, resources, affairs and efforts, the existing needs will reveal themselves. From this information, the organization can develop a mission statement. This might be the improvement of a particular plot of land or body of water, a partnership with local schools, or a commitment to youth development.

While developing a mission statement, the organizing members must establish a board of directors and hire at least one full-time employee. Once the vision and initial personnel are in place, the group can begin to seek funding. Small but well-known family foundations are a good source for some seed funding, as having their name attached to the organization can attract other donors. At the same time, the employee should begin

seeking federal, state, and local government grants as well as private grants. With these funding sources in place, the group can begin to make connections in the community.

Partnerships are essential to the integration of this new organization into the existing fabric of community groups. It is not necessary to find a group with an environmental focus, though these are helpful. Rather, the organization might seek partnerships with a variety of groups, from those interested in community development to those concerned with education, youth development, quality of life, and beautification. These partnerships will help to identify the existing needs of the community, which the organization can help to meet.

Once the first goals have been met, the group should begin hiring staff and taking on volunteers and interns. Volunteers may be readily available at a neighboring high school or college, but need to be managed by someone experienced in working with youth. Thus, the organization might hire a volunteer coordinator. The other kinds of experts needed will vary based on the gaps in expertise in the community groups and the types of projects the organization wishes to undertake. Likely, these might include an ecologist, a fundraiser, an education or curriculum coordinator, a social scientist, a lawyer, and an expert in Geographical Information Systems. Other support services may be supplied by interns if funding does not allow for the hiring of support staff.

As growth continues, specific projects can be developed in partnership with the community groups. An Urban Ecology organization should rarely, if ever, propose particular projects but rather might meet with community leaders to identify needs and desires and then supply their experts' labor to develop a project with the community groups. As particular projects emerge, other necessary areas of expertise may become

apparent, which can lead either to training of existing staff, hiring of new experts, or contracting out to independent consultants.

The organization should not spend more than a year or two without beginning to develop long-term strategic plans, which will include fundraising. In addition to grant applications, the organization should hold regular fundraisers and consider implementing a for-profit branch to both support the non-profit side of the organization and provide job experience to youth volunteers. The strategic plans can be for the immediate future (one to five years) or for long-term goals, as appropriate. Strategic plans for the immediate future should include the maintenance of existing staff and hiring new staff, the location and maintenance of the organization's building, the maintenance of existing partnerships and the developments of new ones, and timelines for completing existing projects. Long-term strategic plans might highlight ongoing educational or environmental goals, such as a study of environmental stewardship in high school students or a gradual improvement of water quality in the region as a result of localized projects. These plans might also highlight the opportunity for the organization's replication or extension to other neighborhoods in the city.

The entire process, from mission statement to strategic plan, must arise not only from the goals of the community and the experience of the staff and board of directors, but from an informed analysis of other Urban Ecology organizations and the founding literature. Without a philosophical basis for its work, an Urban Ecology organization risks futility, hypocrisy, and failure. But when decisions are made based on the field's literature and the experiences of similar organizations, the new organization can avoid

making similar mistakes, feel confident that it is guided by a set of principles, and assure both itself and its partners that each part of each project is in line with the mission.

Finally, as a service to the larger community and itself, the organization should send employees to conferences to share information about their projects, join collaborative networks, and publish its findings and work as much as possible. Only through this flow of information can budding Urban Ecology organizations learn from each other and from those with more experience in the field. In this way, Urban Ecology can begin to inform policy and action across the United States, so that the future of this country might be one of urban reinvestment, redevelopment, and greening, rather than one of depressed urban cores, exurban sprawl, and blight.

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