

Spring 2017

The Value of Urban Gardens as nature: A Philosophical and Psychological Analysis

Amylyn Thayer

Follow this and additional works at: <http://epublications.regis.edu/theses>

Recommended Citation

Thayer, Amylyn, "The Value of Urban Gardens as nature: A Philosophical and Psychological Analysis" (2017). *All Regis University Theses*. 821.

<http://epublications.regis.edu/theses/821>

This Thesis - Open Access is brought to you for free and open access by ePublications at Regis University. It has been accepted for inclusion in All Regis University Theses by an authorized administrator of ePublications at Regis University. For more information, please contact epublications@regis.edu.

**THE VALUE OF URBAN GARDENS AS NATURE:
A PHILOSOPHICAL AND PSYCHOLOGICAL ANALYSIS**

**A thesis submitted to
Regis College
The Honors Program
in partial fulfillment of the requirements
for Graduation with Honors**

by

Amylyn Thayer

May 2017

Thesis written by

Amylyn Thayer

Approved by

Thesis Advisor

Thesis Reader

Accepted by

Director, University Honors Program

Table of Contents

Acknowledgements.....	iv
Introduction.....	1
Chapter One: Defining Nature.....	10
The Difficulties of Defining Nature.....	10
The Historical Roots of the Current North American View of Wilderness as Nature.....	12
Problematic Aspects of the Wilderness Concept.....	14
Beyond Wilderness.....	16
Wildness.....	18
Urban Nature.....	21
Engaging with Nature – Gardening.....	23
Partnership with Nature.....	24
Conclusion.....	29
Chapter Two: The Psychological Value of Nature.....	31
Introduction.....	31
Wilderness.....	34
Nature.....	36
Urban Nature.....	47
Urban Gardens.....	54
Conclusion.....	65
Chapter Three: Implications.....	67
References.....	77

Acknowledgements

Many thanks to my wonderful advisor Dr. Gosselin for being willing to jump into this project after having known me for only a short time and for your support and guidance throughout the year. This work would not have been remotely the same had I not taken Environmental Ethics with you, and for that I am so grateful. Thanks to Dr. Fricks-Gleason for being my reader on a project which was not exactly in your field and being excited about it all the same. To Dr. Gosselin and Dr. Fricks-Gleason both, thank you for helping me to see my work through your eyes and to find joy in it. This meant the world to me before my defense.

Thanks to Dr. Howe and Dr. Kleier for your facilitation of the honors program and the thesis process. Special thanks are due to Dr. Kleier for convincing me several times throughout the past year to not give up on completing a thesis. You were right, it was worth it!

I have such deep gratitude and a special place in my heart for EarthLinks. You all are the reason any of this became possible in the first place; being at EarthLinks changed everything for me. Thanks also to Pablo Burson, Kathryn Redmond, the Office of Service Learning, and the Romero House program for making my time at EarthLinks possible.

To my family, roommates, and friends: thank you for the support, encouragement, solidarity, love, and shared laughs and tears throughout college and especially the past year. I couldn't have done it without you.

Introduction

Gardening in an urban context first captured my imagination during the spring of my sophomore year of college. The concept of urban agriculture especially piqued my interest. I cannot pinpoint what it was about that semester that got me thinking about urban agriculture or exactly why I was feeling drawn to gardening, but I was beginning to find something deeply interesting about the idea of growing food in a city. This is rather curious because at this point in my life, I had essentially no experience with growing plants and little experience with nature in general.

I grew up in Colorado Springs, a sprawling city containing half a million people. Although it is clearly a developed area, it is situated amongst quite a bit of natural beauty and opportunities to engage in outdoor activities. Pikes Peak graces the skyline, Garden of the Gods is located within city limits, and there are plenty of trails for walking, hiking, and biking situated in and around the city. One such place is Ute Valley Park, a city park located right across the street from the house in which I grew up. It contains trails through a canyon and over a hogback ridge; its size and depth make it quite the oasis of nature in the middle of Colorado Springs suburbia. Despite this, I grew up with limited exposure to this nature and did not think much about it during this time. My parents did not hike or camp or do much outside beyond cutting the grass and exercising around a track, so I grew up doing likewise. Being outside and “in nature” was just not an activity which my family sought out. We did hike very occasionally and my dad loves to tell the

story of a hike we took when I was about four years old: my godparents were visiting from Florida so we all went to Ute Valley and on this trip I declared that “My name is Amylyn Thayer and Amylyn Thayer is not a hiker.” Although this statement did not remain entirely true for very long, it did not become entirely false either. As I grew up, I did some amount of hiking and camping with school sports teams and my friends’ families and generally enjoyed it, but being outside and in nature – while always pleasant – was not something that ever got into my blood. The same goes for growing plants. The most exposure I had to growing plants as I was growing up was planting flowers from a place like Home Depot in the front yard and defending tomato plants growing in containers on the back patio against the deer that so loved to them.

And so it was not until college that I became interested in nature, plants, and gardening at all. Before I transferred to Regis, one of the classes that I took during my first semester of college at CSU Fort Collins touched on topics like sustainability, urban design, and local food. I did not feel any special connection to the material while I was in that class, but I do think it helped to set the stage for the interests that I would come to hold later. As I mentioned earlier, it was during my sophomore year that I did begin to be more interested in these topics. During the summer after that year I had the opportunity to become involved with urban gardening firsthand during my internship with a nonprofit called EarthLinks through the summer Romero House program at Regis. Being at EarthLinks not only opened my eyes to gardening and issues of social and environmental justice, but also inspired me to change my course of study. After that summer, I

continued to take Psychology classes to complete the minor but changed my major to Environmental Studies and pursued an additional minor in Community Food Systems.

Romero House is a program through the Office of Service Learning during which students complete volunteer hours at a service site, live in community, and learn about social justice. I chose EarthLinks as my service site for their unique intersection of gardening, craftsmanship, and work with a population of adults experiencing homelessness. Participants at EarthLinks are either currently experiencing homelessness or poverty or have experienced homelessness in the past. They come into what is known as workshop once a week where they spend time working on a range of sustainable, handmade products including items like soap, earrings made out of upcycled materials, and candles decorated with pressed flowers. They earn income for their time spent in workshop, but the ultimate mission of EarthLinks is to create community and to give participants a chance to connect with the Earth. To this end, a large part of the program is based around the garden which is communally cultivated on their property. It is gorgeous. It is a place which provides not only materials for the products made in workshop and food to nourish community members, but it also provides participants a place to garden, to work, and to rest. It is a green oasis in the middle of Denver, a place of life and respite from the urban environment in which participants spend so much of their time, and not necessarily because they want to do so. In fact, part of the design of the garden was the intentional creation of curved raised beds instead of standard rectangular raised beds in order that the garden would look and feel different than the city at large with its straight lines and gridded pattern.

I also was transfixed by the contrast between the city and EarthLinks' garden. EarthLinks is located just outside of downtown and is close to a lot of older industrial buildings and parking lots. Indeed the garden itself is on land that used to be a parking lot for Broncos games and I was so amazed that a garden could even be grown there. I also found that being in the garden was an experience of nature for me, and one that I had not had before. In one sense, being surrounded by the plants in the garden was a way of experiencing nature, but I also felt that actively participating in the processes of gardening and engaging with the life cycles of the plants took that experience of nature to a different level. Nature is embodied in the plants of a garden, but working with those plants was a way of engaging with nature. Because I did not have much experience with either wild or cultivated nature as I was growing up, experiencing this in the garden felt like a revelation to me. To have contact with natural processes and natural rhythms, even in the middle of a city, was not something I had ever considered as a possibility.

But this experience raises important questions. Why did I find being in the garden to be a revelation? Why was I transfixed? Is it valid to consider this as an experience of nature, or does "nature" by definition exclude either the location of a city or active interaction with plants? Can the term "nature" really be applied to either cities or to gardening?

The primary and dominant concept of "nature" in American thought is that of wilderness. The current American conception of wilderness in turn is rooted in the idea that it is a place which is not impacted by the actions of humans and is seen as pristine because of this. Essentially, there is a perceived divide between people and wilderness

and therefore a dichotomy between cities and nature. Wilderness is prized for being uninhabited and untouched by humans and thus is somewhat idealized. People are always visitors to the wilderness and they visit for restoration and regeneration from their day-to-day world of implied urban life, which is often synonymous with moral degeneration and spiritual deadening (Smith, 2005, pp. 300-301).

Yet urbanization, around the world and in the United States, is on the rise. In 1990, less than 40% of the world's populations lived in urban areas. As of 2008, this figure jumped above 50%, and by 2050 it is predicted to be over 70% (World Health Organization, 2010). As of the 2010 census, 80.7% of Americans live in cities (United States Census Bureau, 2010). It is important to acknowledge that so many people live in cities and will continue to live in cities in the foreseeable future. Additionally, land that is protected as wilderness accounts for only about 5% of U.S. land. In the contiguous United States, it is even less, coming in at 2.5% (Bureau of Land Management, 2013). Certainly there are areas of undeveloped or natural land which are not protected as wilderness, but are nonetheless fairly wild or at least rural. These areas can be public or private and can be used for economic, wildlife reserve, or recreational purposes. The catch is that these sorts of open spaces are decreasing due to development. This loss is estimated at 6,000 acres a day or 4 acres every single minute (United States Forest Service, n.d.). Thus, areas of natural land are decreasing while at the same time more and more people are living in cities.

Within cities, people are largely disconnected from nature because of how cities have been designed, which generally does not include contact with nature as a priority.

While nature was common in cities for most of human history in forms such as gardens, grazing commons, orchards, and farms, the Industrial Revolution largely pushed nature out of cities (Hynes & Howe, 2002). Today, structures made by humans are everywhere, primarily composed of synthetic materials like concrete, metal, and bricks. Concrete and asphalt cover the ground and prevent contact with the earth in most places within cities. The plants that are best able to grow in the tough growing conditions of an urban environment are typically considered weeds: examples include dandelions, thistle, and mallow. Only a few species of wildlife can thrive in urban areas and these are the species that people tend to find repulsive or annoying such as raccoons, squirrels, rats, and pigeons. City dwellers tend to spend their days going from one building to another, spending little time outside interacting with whatever nature might be there. Additionally, the perception of a dichotomy between nature and the city conceptually places nature squarely outside the city for many people.

Although it does come with considerable benefits, living in urban areas comes with a particular set of challenges also. These are part of why escaping to the wilderness can seem so appealing. Cities can be crowded, noisy, and stressful places. Cities also have particular health risks, including physical health issues such as increased spread of disease, increases in poor diets, and the effects of violence. Mental health issues can be caused and exacerbated by stressors found in the city. These risks disproportionately affect marginalized populations within cities (World Health Organization, 2010), which are the very populations which find it most difficult to leave the city.

Clearly urban nature is not the same thing as wilderness, but is urban nature a contradiction in terms? If our view of nature is such that it can only be encountered in the wilderness, then we cannot use the term “urban nature” with any integrity. If, however, our view of nature is broader than “the wilderness,” we may be able to find – and even interact with – nature in the city. Importantly, if our view of nature is such that we cannot encounter it in a city, we are bound to not encounter it very often. This is especially salient for people who, for one reason or another, find it difficult or impossible to leave the city in which they live and are therefore unable to access wilderness or wilderness-like spaces. It is therefore highly important that nature is not only found in the wilderness, but in cities too.

If the term “nature” can be applied to the city, can it also be applied to activities like gardening? Does “nature” imply that humans have no direct influence on the biotic community? The concept of wilderness once again reflects that nature is found where humans have not imposed any sort of order or influence on the biotic community and therefore the answer would be yes. However, I suggest that this view needs to be broadened. After all, there are very few places on earth where the natural environment has not been impacted by humans at all (Diegues, 1998, p. 279). To limit our concept of nature to areas that have not been touched by humans is to limit it very much indeed, and to include places which have seen any amount of human influence is to compromise that definition.

I am not arguing that the wilderness is unnecessary or superfluous, but I do think that we need a conception of nature which values forms of nature other than the

wilderness. The idea of wilderness hinges on people being visitors to it, but what if we interacted with nature where we are not visitors, where we in fact live and make our homes? What if we could see past the dichotomy between people and nature? What if we could integrate the concept of nature and interaction with nature into our daily lives? Would we be better for it? Would we be more human?

In my own personal and anecdotal experience, I think this to be the case. It seems to me that engaging in the practice of gardening and working with plants can shape people for the better. Gardening, especially gardening with the intent of producing food, takes a lot of effort on the front end before a harvest is even possible. This means that it takes hard work, patience, and perseverance. It teaches care for something outside the self. Because the quality of soil is so important to the success of gardening, the soil requires investment. This investment, this care of the soil, can foster connection to place because improving and maintaining soil quality is a long-term process. Gardening teaches us about plants and where our food comes from in a tangible way. Furthermore, the successes of gardening are thrilling. When the seedling pokes out of the ground, when the plant's first flower blooms, and when the fruit is ready to be harvested are all moments of celebration and a testament to the power of both hard work and collaboration with nature. They are moments of life and I believe that the growing of food is a deep connection to life itself because food is foundational to our very existence as humans.

These ideas have psychological implications as well. Another avenue of this topic is the intersection between psychology and nature, and specifically the intersection between psychology and gardening. It appears that nature plays a role in psychological

well-being, and engagement with nature in the form of urban gardening can be a way of increasing contact with nature and thus its benefits in everyday life.

This thesis will first explore through a philosophical lens how we might define nature to be more expansive in order to conceptually include forms of nature other than the wilderness, and how the methods and practices that we use when we interact with nature affect our relationship with it. I will then review the psychological literature related to exposure to nature, and specifically urban forms of nature, culminating with gardening. Finally, I will explore the implications of this work with regards to social justice and on the levels of individuals, policy, and culture.

Chapter One Defining Nature

“In Wildness is the preservation of the World.”
~Henry David Thoreau

The Difficulties of Defining Nature

Nature is a difficult term to define because different people tend to have different ideas in mind when they use it. It may be used to mean a wilderness space which has not been influenced by people at all or a natural setting which is only minimally influenced by people. It could be used to refer only to life, like that of plants and animals, or it could be used to also reference physical and chemical processes in the natural world or inanimate elements of the material world like water and minerals. Some may find “urban nature” to be a contradiction of terms, while others see plants and animals found in cities as forms of urban nature. Additionally, gardens and other planned natural landscapes may be considered natural, at least to some extent, by some people but considered unnatural by others.

One of the difficulties behind these varying definitions is that English has a limited vocabulary for dealing with nature (Kaplan & Kaplan, 1989, p. 2). The Oxford English dictionary lists it as “the phenomena of the physical world collectively, including plants, animals, the landscape, and other features and products of the earth, as opposed to humans or human creations” (“Nature,” n.d.). Defined this way, it is an umbrella term as

it can be used to reference anything in the physical world which comes from the earth. Technically, correct use of the term “nature” might equally refer to a wilderness landscape, a hiking trail just outside the city, a rural landscape, an urban park, a collection of organisms, or individual organisms.

Yet the way people use the term tends to differ from this official dictionary definition. Many people would say that nature is what is “out there,” out beyond civilization, and that nature is comprised of animal and plant life but only within the context of wilderness and pristine ecosystems. It is “often reserved for areas that have been unaffected by human influence, that have trees and other vegetation, and that have considerable extent” (Kaplan & Kaplan, 1989, p. 150). In American thought, the term “nature” is primarily used to reference wilderness or wilderness-like landscapes. The term “wilderness,” in turn, is often associated with areas in which humans have had absolutely no influence. According to this line of thought, the definition of nature would be a setting which is neither made nor influenced by humans and is also rather vast. In short, American thought tends to equate “nature” with “pristine wilderness” and subsequently puts more value on wilderness spaces than any other form that nature could take.

However, this view of nature is incomplete. It fails to take into account any natural phenomena aside from those which are completely separated from human influence, including many of those upon which we rely for life. It is short-sighted to place value only on wilderness spaces. In this chapter, I will argue for an expansive definition

of nature which, through the lens of “wildness,” includes much more than wilderness. Encompassed within this definition are both urban nature and urban gardens.

The Historical Roots of the Current North American View of Wilderness as Nature

The conflation of “nature” with “wilderness” is rooted in the history of the American people with the lands of North America and within the cultural context of several historical time periods. Our cultural idea of wilderness is unique to the U.S. and was originally formed in the century between the 1830’s and the 1930’s, inspired by the likes of Ralph Waldo Emerson, Henry David Thoreau, Theodore Roosevelt, and Aldo Leopold. During this time, the wilderness was seen as fulfilling several purposes: as an undeveloped space fit for traditionally masculine forms of recreation, as an inspiring place good for solitude and reflection, and as a beautiful place which inspired art and gave the country a source of national identity. In the following decades, the Wilderness Act of 1964 enshrined this cultural concept as legislation (Nelson & Callicott, 2008, pp. 5-9). However, portions of the history of the concept of wilderness are actually rather disturbing. Although we have esteemed it, we have also feared it, inflicted damage upon it, and subjugated it to our desires. The relationship between our society and the wilderness has a troubled past.

Irene Klaver asserts that “wilderness is a story – a relatively new story, historically idiosyncratic to the nineteenth-century West, when modern civilization got a firm grip on our lives.” When colonists began to come to the New World and expand westward, the wilderness was seen as threatening and hostile and as something to be conquered to ensure that it became both safe and functional for their purposes. Later,

even at the same time that Americans were finding a national identity in the landscapes of the West in order to counter Europe's perceived cultural superiority, a wide-scale desecration of the land was already underway. By the mid 1800's, more than 75 million bison were killed and wolves could no longer survive on the plains due both to hunting and to extermination when they began to kill domestic livestock. In the second half of the 19th century, approximately 500 million animals were killed in the West (Klaver, 2008, pp. 486-487). Not only was wild animal life decimated on the plains, but "the cattle industry took the vast interior grasslands, mining companies took the mountains, and the timber industry took the trees. Together they left a legacy of exploitation and destruction on a scale never gauged fully but with a result that has become understood and legitimized as economic "necessity," manifest destiny. To temper this intemperate exploitation, wilderness areas were belatedly established" (Klaver, 2008, pp. 488-489). Klaver's point here is powerful. American society created the idea of wilderness as being set apart from humans once we had forgotten how to coexist with what is wild. We thought to protect the natural world only after we ruthlessly exploited it. The American conception of wilderness was born of this exploitation.

The frontier itself played a role in the formation of the concept of wilderness as well. The frontier was a crucial part of American national identity as settlers continually expanded westward. It was so crucial to national identity at this time that it is perhaps "the nation's most sacred myth of origin" (Cronon, 1995, p. 77). It was seen as a place of rugged individualism which was not governed by the modern, and thus insidious, ways of civilization. Because it was always going to disappear, it always had an air of nostalgia

about it. When the frontier became completely settled, many Americans felt particularly anxious about that. Protecting areas of wilderness thus also became a way of preserving national identity in the face of the closing of the frontier. For, as William Cronon notes, although “the frontier might be gone, ... the frontier experience could still be had if only wilderness were preserved” (Cronon, 1995, p. 78).

Another of the myths of wilderness is that it must be uninhabited to be authentic. Because North American lands had always been inhabited by Native Americans, the land could only be perceived as uninhabited after the wide-scale slaughter and removal of Native Americans (Cronon, 1995, p. 79). In a final twist to the myth of wilderness, it became clear around the end of the twentieth century that pristine, untouched wilderness was virtually nonexistent. The North American landscape was widely assumed to have been pristine prior to the entrance of Europeans, but in fact it had always been modified by the presence and actions of Native Americans (Denevan, 1992).

Problematic Aspects of the Wilderness Concept

Wilderness is a culturally constructed concept, and a problematic one at that. What we see and think of as “pristine” wilderness is not in fact pristine, having been modified by humans long before our own society took root in this land. The concept of wilderness is furthermore a product of culture. We prize wilderness and put borders around it because our culture has forgotten how to actually live with nature. We therefore see nature only in the wilderness, and tend to define it as the opposite of civilization.

Both the history and the contemporary state of wilderness are also bound up with elitism. When the concept of protecting wilderness first began to come into existence, it

was only wealthy people who could afford to seek out the wilderness experience. Most of these people came from urban areas and approached these spaces as tourists and with purposes of recreation and consumption. This is in stark contrast to people who have lived with and off of the land (Cronon, 1995, pp. 78-79). Thus they “created wilderness in their own image” (Cronon, 1995, p. 79). A similar problem exists today. We continue to create wilderness in our own image, seeing untouched land as ideal without acknowledging that we depend on land which has been worked by humans in various ways for both our survival and our lifestyles. Furthermore, wilderness experiences are still generally inaccessible to less affluent segments of the population.

Because the wilderness concept is not cross-cultural, attempts to export the idea of wilderness to other places and cultures have been rather damaging. The idea that nature and people cannot coexist and the corresponding conservationist model of creating parks with boundaries within which humans are only visitors has wreaked havoc in places like China and Brazil, where indigenous populations still rely on the land for subsistence living (Diegues, 1998; Han, 2008).

Furthermore, even here in the U.S., there are problems with our own cultural conception of wilderness. Because we have created places like nature preserves and national parks to contain wilderness and wilderness-like spaces, it is easy to fall into the trap of thinking that we have done enough regarding our treatment of nature. These spaces “offer the comfortable illusion that we have, as a society, paid our dues to the natural world: the grandeur, open spaces, and habituated wildlife on display induce a sense of abundance, of ecological richness and health” (Jones, 2013, p. 60-70). This sense

of ecological health that wilderness areas display can distract us from the ecological degradation which now marks most land across the country. Additionally, when we prize wilderness because it is protected from our own actions, then we run the risk of viewing the rest of the land as being spaces that, because they are not protected, are spaces in which it is unproblematic to desecrate nature (Nelson & Callicott, 2008, p. 14).

Although the concept of wilderness has some problematic aspects, the benefits of physical wilderness are important and should be recognized as such. Large tracts of land which are not under destructive forms of human influence are necessary to protect endangered species and biodiversity, the latter of which is itself necessary for the healthy functioning of the planet (Nelson & Callicott, 2008, p. 8). We cannot develop and extract resources from every inch of our land and expect the land to keep supporting us. It is therefore necessary that our society keeps areas of wilderness set aside for these reasons. However, it would be incorrect to assume that wilderness is the only form that nature can take and thinking so increases our tendency for destructive ecological impacts to the land. Wilderness may be the most “natural” form of nature and the form most un-impacted by humans, but it would also be incorrect to assume that therefore any other form of nature is worthless.

Beyond Wilderness

There are spaces and places which are clearly not pristine, but which we could more easily consider nature than that which is found in urban areas. Andrea Jones provides an example of this with the area surrounding her home in Fourmile Creek, located outside of Boulder.

[It is a] landscape where human influences are not primary. The trees and shrubs and cacti have chosen their own locations; they grow (or not) according to the conditions of soil and weather, rather than a landscaper's whim... But this is not wilderness by any stretch. From trash to... low-flying air traffic passing to and from Denver's airport forty miles away, signs of civilization are easier to find than they are to ignore. The country road that provides access [to the] house... is a two-lane plateau carved from the hills... Dozens of old mining roads criss-cross the slopes... The entire area is pockmarked with mine shafts... [and] there are tangles of antique barbed wire, gun-shot signs, even the twisted carcasses of old cars.

(Jones, 2013, pp. 26-27)

As Jones' passage makes clear, there is a gradation of categorization when it comes to "natural" spaces in the United States. The Wilderness Act allowed for the setting aside of federal lands to be designated as wilderness. Wilderness is officially defined as areas "where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain" and where "undeveloped Federal land retain[s] its primeval character and influence without permanent improvements or human habitation, [being] protected and managed so as to preserve its natural conditions" (National Park Service, n.d.). Not quite half of the lands designated as wilderness reside in the National Park System, and not all land in the National Park System is designated as wilderness.

The National Park System is likely what many Americans think of when they think of nature, equating the parks with wilderness and wilderness with grand and

traditionally beautiful natural spaces. However, equating nature with the wilderness we have contained in national parks “run[s] the risk of redefining “nature” as a set of geographic locations rather than the biological, meteorological, geological, and climatological matrix in which our species exists at all times and as a matter of life and death” (Jones, 2013, p. 69). Although we tend to equate nature with landscapes, and particularly with beautiful wilderness landscapes, nature is so much more than that. A richer view of nature includes the ecosystems which are integral to forming the landscapes, the relationships between organisms which make up ecosystems, and the physical and chemical processes which fundamentally support the life of organisms. Viewed this way, nature is not confined to the wilderness, but rather can be found in the soil, in the weather, in individual organisms, and in the complex web of life which is interconnected across the whole earth.

Wildness

The concept of “wildness” is a useful lens through which to understand nature as more than wilderness. Klaver’s rather poetic concept of wildness is that it represents what we do not fully know and cannot completely understand. It is what we cannot fully control. Whereas wilderness is a space defined by precise borders, wildness indicates that which is not easily definable. It is what is unpredictable and unexpected, that which sometimes “escap[es] human measurements, ... [it] tends to transcend the frames of our thoughts” (Klaver, 2008, p. 492) and “escapes the frames of our knowledge” (Klaver, 2008, p. 485). It includes contact with that which is other than human. It is “what comes and goes... and what travels... through our borders” (Klaver, 2008, pp. 496-497). It is “at

the heart of otherness” (Klaver, 2008, p. 490), that which is apart from a fixed “us” and which therefore often invokes fear. This fear in turn provokes a desire for exclusion and control (Klaver, 2008, pp. 485-497). Wild has an essence of mystery.

Perhaps the most important quality of wildness is that we cannot completely understand or fully know that which is wild. The study of biology and of the physical phenomena of nature in science more generally is an exercise in wildness because we can never be finished knowing about it. In even just one species, there is “a biological machine so complicated that to understand just one part of it – wings, heart, ovary, brain – can consume many lifetimes of original investigation” (Wilson, 1984, pp. 18-19). Even soil has so much complexity at increasingly microscopic scales that there is a whole world there to understand. Wilson calls it “a miniature wilderness that can take almost forever to explore” (1984, pp. 13-14). If we more fully realized what soil contains, we would be amazed by it. Because we do not fully understand the physical phenomena of nature, nature in any form will always be a mystery to some extent and therefore has the quality of wildness.

As interpreted by Jonathan Maskit, French philosophers Gilles Deleuze and Félix Guattari also have a conception of “wildness,” and it is more strictly philosophical than Klaver’s. They make a distinction between smooth space and striated space in their work. Striated space is space in which all movement and activity happen according to predetermined boundaries and paths. In contrast, smooth space is where both paths and destinations are not fixed; there are no rules, limits, or paths. Maskit suggests that “this notion of smooth space seems to have a certain element of *wildness* about it” (Maskit,

2008, p. 472). Cities are good examples of extremely striated spaces. They physically channel movement via the built environment and human influence has impacted most of their characteristics. On the other hand, the ocean is a good example of an extremely smooth space because there is no possibility of human infrastructure channeling movement and so movement can occur in any direction. All spaces, even cities and the seas, are combinations of smooth and striated space as there are no spaces which are purely smooth or purely striated. Spaces are always in flux as to how smooth and how striated they are; the degrees are always changing (Maskit, 2008, p. 470-472). Striated space has much to do with human control of the environment, so spaces are less striated when there is generally less human control or when human plans for control have been interrupted. Examples of a striated space becoming smoother include when “the manicured lawn is ‘rudely’ interrupted by dandelions... [and when] one finds rabbits and deer eating in the garden” (Maskit, 2008, p. 473). In both of these examples, nature has contributed to the re-smoothing of striated space by interrupting human plans of control.

Maskit makes clear that, although they have often been conflated, wilderness is not the same thing as wildness. Wilderness has connotations of purity, meaning that it must be originally smooth space, not just re-smoothed space. Additionally, in the process of legislating wilderness, drawing boundaries, and coming up with rules, we make wilderness spaces less wild. Re-smoothing produces wildness, but not all wildness is wilderness. Thus, wildness can show up in the city in forms such as plants erupting in the cracks of the sidewalk, suburban yards that have gone to seed, and abandoned industrial sites which have been overtaken by plant life (Maskit, 2008, pp. 472-474).

Perhaps what we are looking for in nature is not so much wilderness as it is wildness. Part of what we value about being in the wilderness is experiencing its sense of wildness by being in a space in which we can start to understand what the world would be like if it was less stratified by human control. Wildness is certainly present in the wilderness and perhaps wilderness is the ultimate embodiment of wildness, yet wildness is not confined to defined wilderness spaces. As Jones alluded to, the matrix in which we live is inherently wild. Acknowledging this wildness contributes to a richer view of nature, one in which we can find and value it all around us in the complex web of life on the earth and even the physical, chemical, geological, and biological processes which are integral to this web of life.

Urban Nature

What does this mean for the concept of urban nature? If we take nature to mean “wilderness,” then urban nature is certainly a contradiction in terms. If, however, we take nature to be synonymous with having the quality of wildness, then urban nature no longer has to be a contradiction. In this case it is undeniable that wildness can be found in settings beside wilderness. In fact, part of what we find valuable about wilderness we might be able to find in other forms of nature also, including urban nature, that form of nature which is found in cities, in the very heart of civilization.

How can nature fit into the paradigm of the city? We often think of cities as concrete jungles because they are primarily composed of manmade materials and structures, and indeed much concrete. However, all cities contain some degree of nature.

Picturing a city with absolutely no plant or animal life in it is all but impossible and all cities are situated within a climate and experience the natural processes of the weather.

Most people do not have ready access to the wilderness. Instead, people are far more likely to be near to a form of nature which is much smaller and clearly has been influenced by humans, and this is likely to include vegetation. The designation of urban nature, which otherwise could be called “nearby nature,” includes spaces such as urban parks and stream corridors but also any form of vegetation or presence of animal life within city boundaries (Kaplan & Kaplan, 1989, pp. 150-151).

The particular form of urban nature with which I am primarily concerned in this paper is plant life. Vegetation within the city signifies wildness because it cannot be completely controlled and it cannot be fully understood, thus it contributes to the smoothing of space within the city. The processes of life contain much mystery, and this applies to plant life just as much as to human life. Plant life arises where it is not asked to, like in the cracks of sidewalks and as weeds in the garden. Equally, plants also do not always grow in the places in which they are asked to grow. However, if we pay enough attention to the plant life in our midst, we just might find “a sense of the unknown and the possibility that something extraordinary might be found” right where we live (Wilson, 1984, p. 89). A fulfilling nature experience is not bound to the space of wilderness. The wildness of nature can be found in the city, as long as we are willing to look for the possibility of the unknown and the extraordinary where we might not necessarily expect it.

Engaging with Nature – Gardening

Just as our culture has a bias towards wilderness as nature, we also have a bias towards passivity with nature. The dominant ethic regarding wilderness use is the Leave No Trace principle, which stipulates that humans are only visitors in the wilderness and should not leave anything there nor take anything from it (Turner, 2002, pp. 137, 157). While there is undeniably valid logic behind this principle in our current societal context, this idea of passivity also extends to activities like gardening, farming, horticulture, and agriculture. If it is problematic for the traditional American view of nature when wilderness is not pristine, it is even more problematic when settings are heavily influenced or completely planned by humans. Even though these pursuits put people into close contact with animals and plants, many would not consider the outcomes of these pursuits to be “nature” because they require active participation and thus influence the form that nature takes.

Certainly, too much human influence over natural landscapes is generally destructive. However, even when activities like these do influence the form that nature takes, they are still a way of engaging with nature. To garden is to encounter wildness. Gardening obliges people to have contact with non-human species including the plants that are intended to be grown, the weeds that happen to come up, the insects that make their home among the plants, the wildlife that may come through the garden, and organisms that live in the soil. Gardening additionally forces us to pay attention to the wildness of the weather and the challenges that the climate presents. It is an encounter

with the mystery of plant and soil life and is an intimate engagement with the mysteries of growing.

Additionally, gardening asks us to pay attention to and to care about natural processes like soil-building and the weather. When living in cities, we can shelter ourselves from natural processes to a degree. Other than serious weather events, we are content to be outside when we want to be and to stay inside when we would rather not face the elements. However, when we engage with the plant life around us – especially if we are nurturing it – we care about how the weather affects it. A minor hailstorm is no longer just an inconvenience to us, it now also poses a serious danger to our garden, and by extension, ourselves. Similarly, a rainstorm is no longer just a weather event whether welcomed by personal preference or not, it also means that the garden is going to get water. When one cares about a garden, one also cares about the outside world in ways that extend beyond one's direct sense of self.

Partnership with Nature

Although gardening is an activity which puts people into contact with nature, the type of engagement that people have with nature is not always beneficial. When people are engaged with nature, this engagement can either be in the form of working with nature or in the form of working against nature. Much of working either with or against nature has to do with control and the degree to which we collaborate with or dominate the biotic community. Of course in all gardens, humans exert some form of control. However, according to Deleuze and Guattari, spaces are neither fully smooth nor fully striated and this applies to gardens as well. We can apply the concepts of smooth and

striated space to gardening through the ways in which control can be exerted over a garden. Particular methods contribute more to striation than others. Methods which seek to control nature's processes and subjugate it to our desires are the ones which contribute more to striation and are the ones which can be categorized as working against nature. These methods also tend to be ecologically irresponsible or at least ecologically questionable and contribute to degradation of the land and the environment. However, when we give up some of our desire for control over nature and instead learn its rhythms and processes and seek to integrate our action with how nature functions without us, then we are working with nature instead of against it. Methods in this vein are less striating because they acknowledge and respect the wildness of nature.

One way that we can assess this distinction between working with nature and working against nature is through the health of the soil in the garden. I propose soil health as a metric because the health of every component of a natural system and the system as a whole depends in large part on the health of the soil. This is especially true in systems which produce food – like farms and gardens – because the soil in these systems is often being disturbed by human activity to some degree and thus care needs to be taken in replenishing it. Soil is quite literally a foundational component of natural systems and of life on earth in general. Plants depend on soil and humans and animals fundamentally depend on plants, due to plants' unique capacity to photosynthesize.

Soil is composed primarily of finely ground rock particles, organic matter, and the open spaces between these particles, which are filled with air and water. Soil contains not only these inanimate materials, but also a whole world of living organisms, including

protozoa, bacteria, fungi, arthropods, and earthworms. These organisms contribute to the availability of nutrients in the soil and to soil's complex structure. The cycles of soil life are fueled by decomposition of dead plant material. The microorganisms and earthworms in the soil feed upon this decaying material, eventually freeing up the nutrients for plant use. They contribute to soil structure as well: earthworm burrows contribute to soil aeration, provide space for plant roots to grow, and provide channels for water. Soil contains a whole ecosystem, full of symbiotic relationships (Harris, 2009, pp. 2-6). Because of the importance of soil, practices that increase or maintain the health of the soil therefore are practices which work with nature, whereas practices that decrease the health of the soil are practices which work against nature.

Making a distinction between practices that harm the soil and practices that improve or maintain soil health can be tricky because each piece of land is different. Gardening in a responsible manner means thinking about the larger ecosystem in which the garden is situated and the smaller ecosystem which is created within the garden (Harris, 2009, p. XIV). Generally, practices that can facilitate responsible gardening align with organic and permaculture approaches. Organic methods eliminate chemical inputs into the system and permaculture methods seek to emulate natural systems.

Oftentimes, practices which decrease the health of the soil are the same practices by which people exert control over the land. These practices include the use of chemical pesticides and fertilizers, mono-cropping, and tilling. "Pesticide" is an umbrella term for any chemical substance used to kill organisms that harm cultivated plants. Pesticides include herbicides, insecticides, and fungicides. They are used to exert control over

insects and weeds, yet they also harm the soil because they harm the microorganisms living in it (Aktar, Sengupta, & Chowdhury, 2009), thus throwing off the balance in the complex network of relationships between organisms in the soil. Chemical fertilizers are often too strong and can thus actually damage plants. Mono-cropping is the practice of growing only one type of crop in an area, which causes soil nutrients to be thrown off balance and sets the stage for pest infestations. Tilling compacts the soil, which disrupts the soil structure that soil organisms have created (Harris, 2009, pp. 2-3, 12-13). These are all practices which could be used in small-scale gardens and contribute to striation, both conceptually in that they are methods of exerting control over nature and visibly in that they can also physically contribute to space looking more striated.

In contrast to these practices which are harmful for soil, practices that responsibly manage soil include no-till methods, crop rotation, cover crops, use of organic fertilizer, use of native plants, and companion planting. No-till methods reduce compaction of the soil and allow the microorganisms living in it to create their own soil structure. Crop rotation ensures that the same nutrients are not being taken from the soil every growing season, which reduces the need for fertilizer input. Cover cropping is the practice of planting species which will restore nutrients to the soil during the off-season. Organic types of fertilizer include compost and manure and are much more natural ways of putting nutrients into the soil than chemical fertilizers are, which means that plants can take them up easily and safely. Native plants evolved in the area to which they are native and thus are adapted to the climate and the soil conditions, which means that they require less human intervention for successful growing. Increasing biodiversity and planting

polycultures, known as companion planting when plants are paired in specific ways, greatly reduces the chances of attracting harmful insects and creates a balance of nutrients being taken from the soil (Harris, 2009, pp. XVI-XVII). Each of these practices can be implemented at the scale of gardening, and indeed are easier to implement at a small scale in a garden than on a larger scale. These methods contribute to the smoothing of space within a garden and gardens cultivated using these methods often visibly look less striated than others.

Practices which decrease the health of the soil also alienate the practitioner from nature. Even though it is a form of contact with nature, this detrimental form of engagement results in an unhealthy relationship with nature, marked by domination and harmful ecological effects. To dominate nature in such a way is to sacrifice the possibility of a fulfilling relationship with nature because domination is rooted in an inability to see the other for what it is. It is to overlook the wildness of nature. Oftentimes in the case of gardeners who use such practices, this is accidental and is due to simply not taking the time to think through gardening practices. Despite possible unintentionality, these practices still preclude a healthy relationship with nature.

Ways of gardening which seek to improve the health of the soil and respect the wildness of nature could be called partnership or collaboration with nature (Merchant, 2003, p. 223). Embracing this ethic requires us to adapt to nature and to value the wildness which is inherently out of human control, both the wildness in individual elements of the garden and the wildness inherent in participating in a system which is larger than the gardener. Partnership with nature may look something like this: “There is

no bad season: every season presents the gardener with a challenge and an interest of its own. All weather is good for somebody, or some plant, somewhere. The gardener cannot change these things. He [or she] must accept the challenge of learning to understand the seasons and of adapting himself [or herself] to work within their never-ending cycle” (Seymour, 1979, as cited in Kaplan & Kaplan, 1989, pp. 190-191). Much of gardening is learning to deal with the unexpected, and when practiced in a way that does not seek to control nature, the practice of gardening can teach the gardener that partnership is more fulfilling than control. Partnership with nature is the practice of learning to understand natural cycles and processes and seeking to work within the bounds of these cycles and processes instead of seeking to dominate them. When done responsibly, gardening is a beautiful form of partnership with nature.

Conclusion

Nature is big. It is the cycle of life and death and the transformation of physical materials and energy that that the earth sustains over the course of time. It is present in the vast “untouched” wilderness, but it is also present in rural areas, in the plants growing in the city, and in natural processes like the weather. It is the worms in the soil, the plants growing in the backyard garden, and the functioning of our own bodies. Nature is alive and ever-changing but always in the context of cycles, however unpredictable or uncontrollable they may be. The natural world – be it an area of wilderness, the trees that line the sidewalk, tomato plants growing in a garden, the plants popping up in the cracks of the sidewalk, or the whole world that is present in a handful of garden soil – always

escapes the frames of our knowledge to some extent. Thus each of these examples possess elements of wildness and therefore qualify as nature.

If we were to define nature as just one particular setting or with one set of assumptions, we would be privileging that conception of nature above all others. As the Kaplans point out, “for some, nature is favored if it is groomed, orderly, and with indication of human-sign. For others, nature that appears unmanaged and wild is the more preferred. To label only one end of such a suggested continuum as ‘nature’ would undermine the strong positive feelings common to most of these groups with respect to the natural environment” (Kaplan & Kaplan, 1989, p. 105). To define nature as “wild,” then, includes these different conceptions of nature and does not privilege one over the other. It includes urban nature as well as the wilderness. To define nature as “wild” and to prioritize working with nature over attempting to control nature means that urban gardens are also a form of nature. They are in fact an important form of nature because they allow people to actually engage with nature, even while in the city. Furthermore, these forms of nature have important psychological benefits, which will be examined in the next chapter.

Chapter Two

The Psychological Value of Nature

“People have identified connections between the landscape and health throughout history, and attempted to understand the mechanisms and reasons behind this relationship. In some instances, there is a surprisingly close resonance between theories articulated centuries ago and those of current researchers.”

~Catharine Ward Thompson (2011, p. 188)

Introduction

That nature has psychological value has been an intuitive concept to many people. Being in nature feels emotionally important for many people, those who seek the outdoors for adventure or peace and find refreshment and restoration in nature. The writing of nature writers such as Henry David Thoreau, Ralph Waldo Emerson, and John Muir also demonstrates these feelings. For instance, John Muir wrote that “going to the mountains is going home; ... wildness is a necessity; and ... mountain parks and reservations are useful not only as fountains of timber and irrigating rivers, but as fountains of life” (Muir, 1901, p. 1). Civilizations have long venerated nature as being an important element of good and healthy lives, at least back to ancient times in Greece and Rome. This belief is also evident in England’s urban parks movement in the 1800’s and it inspired those who created New York’s Central Park (Thompson, 2011). On some level, appreciating nature for what it can do for human well-being on a psychological level is common wisdom.

Although people have long theorized about the psychological value of nature, one of the most influential iterations of this sentiment came from evolutionary biologist and entomologist E. O. Wilson in the 1980's. Known as the Biophilia Hypothesis, Wilson's basic assertion is that humans have an "innate tendency to focus on life and lifelike processes" (Wilson, 1984, p. 1) and therefore instinctively seek out and value nature. The impetus for his formulation of the Biophilia Hypothesis were his own emotionally poignant experiences with nature, but he sought to situate his experiences within a more scientific and generalizable context. He theorizes that this innate tendency towards nature has a biological and genetic basis, due to natural selection and evolution. The logic is that because *Homo sapiens* evolved within the context of the natural world and survival depended on the ability to interact productively with nature (Wilson, 1984, p. 101), natural selection favored those genes which allowed humans to survive (Wilson, 1984, p. 12). His conclusion is that the human brain is wired to value nature. The Biophilia Hypothesis has had an incredibly influential impact. Many recent psychological studies and much of the literature on nature cites it. However, although it is powerfully stated, it is also fundamentally theoretical as it is based primarily on speculation with little possibility of supporting evidence.

And yet there is more to this idea that nature is valuable than common wisdom and speculation. There is documented scientific evidence about the benefits of a variety of forms of nature for human well-being. Rachel and Stephen Kaplan were among the first psychological researchers to study the psychological value of nature and certainly did the bulk of the early work in this field. Conducted between the 1970's and the 1990's,

they designed a series of psychological studies to begin to elucidate the impact of a variety of natural environments on people. Their research program included the study of people's preferences for a variety of landscapes and scenes, psychological changes after participation in a wilderness adventure program, and effects of nearby nature, including the presence of and participation in gardens.

The Kaplans continued to publish research over the years and many other researchers took up the mantle as well. Research about the effects of nature on such diverse psychological qualities as mood, cognition, attention, stress, and self-esteem and have been studied. An additional body of research has been done specifically with regards to gardens and the psychological benefits that interacting with nature in the setting of a garden can confer.

There are challenges that come with this type of research, which do not necessarily call into question the research that has already been done, but rather point towards what research needs to be done in the future. Some of the research is epidemiological, meaning that it looks at patterns of health and disease in large populations. These studies are correlational, and thus cannot establish causation. Additionally, the definition of nature is not just a philosophical problem and also has applications to these types of psychological studies. Many of the studies measure "nature" or "nature exposure," but nature lacks a standard definition across the board and thus the nature variable is different depending on the study. This makes it difficult to establish how much nature and what kind is optimal or necessary. The role of mechanisms is another question: it is often difficult to tease apart to what extent nature

itself is having an effect or whether the effect is occurring for another reason. Most studies have analyzed what exposure to nature does to psychological processes and the questions of how and why have remained largely untested, although several researchers have constructed theories to answer this question (Frumkin, 2013; Shanahan et al., 2015). This paper will highlight studies which are the exceptions to these trends, including studies that examine causation and mechanisms.

Wilderness

Perhaps the most sought-after form of nature for the purposes of psychological relief is wilderness or wilderness-like spaces. And certainly there are psychological benefits of contact with wilderness spaces. One component of the Kaplans' research program was a series of studies about wilderness experiences.

Their early wilderness research focused on comparisons between participants who went on a wilderness experience trip and a control group of people who did not, primarily with regards to self-perceived competence and self-esteem. These studies found that the wilderness program participants rated themselves as having increased self-perceived competence with regards to wilderness survival skills after participation in the program, and that higher scores in self-perceived competence correlated with more positive self-esteem. Participants who had low scores on a Positive View scale before participation in the wilderness program were twice as likely to show a gain 6 months later than people in the control group were. Additionally, about half of participants who had initially scored high with regards to negative self-perception did not think of themselves negatively after the experience. These changes were documented months later, suggesting that the effects

of the program on self-esteem and self-perception are long lasting (Kaplan & Kaplan, 1989, pp. 126-129).

The next part of their research switched focus from comparisons of a wilderness group to a control group and instead focused on the wilderness experience itself. This research had three emphases: the process of getting to know a new and potentially intimidating environment, what participants experienced during the portion of the trip which they spent in solitude, and what changes participants experienced in their lives once they returned from the wilderness experience (Kaplan & Kaplan, 1989, p. 130). By the end of the wilderness experience, participants displayed an increased sense of comfort with the wilderness setting and their abilities to succeed in it and their worries about the setting decreased (Kaplan & Kaplan, 1989, pp. 130-136, 293-294). Each trip included a period of 48 hours in which participants were separated from each other and spent the time alone. Ratings of this portion of the trip were generally high. However, even for those who did not rate it highly at the time because they found it difficult generally did rate it higher at the end of the trip because they integrated the experience of having made it through the solo period into their self-assessment in a positive manner (Kaplan & Kaplan, 1989, pp. 136-140). Evaluation of journal entries throughout the trips and after they ended indicated that participants left feeling like they knew themselves better and felt more calm and at peace. Being in contact with the wilderness left participants with a sense of wonder and awe and returning to civilization meant returning to both positive and negative aspects of society. Journal entries indicated that many participants noticed

nature in everyday environments more after the trip and also experienced an increase in self-confidence (Kaplan & Kaplan, 1989, pp. 140-144).

Nature

Research on the psychological effects of wilderness spaces is actually rather uncommon, and much more research has been done regarding nature in general. The Kaplans and others conducted a series of studies regarding human preference for different environments. Preference is defined as the inclination to favor one stimulus over others, and in this case the stimuli were scenes of various outdoor settings. The Kaplans contend that preference is not a trivial matter, but rather that it ultimately reflects basic needs and previous experiences. Therefore preference is likely “to be greater for settings in which an organism is likely to thrive and diminished for those in which it may be harmed or rendered ineffective” (Kaplan & Kaplan, 1989, p. 10). The organism, in this case a human, may not know why their preferences exist as the judging of preference is largely a subconscious process (Kaplan & Kaplan, 1989, pp. 10-15).

The studies were conducted using black and white photographs or slides of various landscapes and scenes, a collection of which were shown to the participants. Photographs were used because preference responses to photographs and the real places where the photographs were taken are very similar. Black and white photos were used so that inaccuracies in color printing would not hamper the results; additionally, people can imagine the color in the scene with little trouble. The participants were then asked to rate each scene on a scale of one to five, where one meant that they did not like it and five meant that they liked it very much. Each scene was also rated for other qualities in order

to understand which qualities the preferences were for (Kaplan & Kaplan, 1989, pp. 15-17). These other qualities were determined using Category-Identifying Methodology, which is a computational data-reduction technique that was used to identify patterns in order to group the collection of settings used for each study into categories based on commonalities. This methodology takes into account only numbers. The raw preference data for the whole collection of scenes is analyzed for correlations between the data. Images that have a high correlation due to similarity of high preference ratings or low preference ratings are then grouped into respective categories. Because the categories are based only on correlations of numbers, the researcher must then identify what the common theme of each category is (Kaplan & Kaplan, 1989, pp. 211-213).

Out of all of the data, the researchers defined two major categories. The first category concerns content and the second concerns spatial configuration. Categories which are content-based are based on particular components found in the scenes. Examples of content-based categories include waterscapes, nature, and non-natural. The spatial configuration categories have to do with the sense of three dimensional space which could be inferred from the photographs. An example of a spatial configuration category is a grouping of settings which all allow the viewer to see far into the distance without any visual barriers (Kaplan & Kaplan, 1989, pp. 26-27, 32).

One of the most salient spectrums of content-based categories which emerged from the research was that of the amount of human influence in the various settings (Kaplan & Kaplan, 1989, pp. 28-31). Across all the studies, industrial settings were always rated low when they were included in the collection of scenes. In most of the

studies conducted, the categories which had the most distinct human influence had the lowest relative preference ratings and categories which featured nature as the dominant content had the highest relative ratings. However, not all of the categories which included human influence were rated low on the preference scale. The major exception to this pattern occurred for scenes where the visible human influence did not dominate the rest of the scene and seemed to be in harmony with the natural setting (Kaplan & Kaplan, 1989, pp. 42-44).

In the broad classification of spatial configuration-based categories, the most salient category was a spectrum of openness. On one end of the openness spectrum is wide-open spaces. These settings were further categorized into two subcategories with regards to the degree of human influence perceivable in the landscape. The other end of the openness spectrum is comprised of settings in which the long-distance view is obstructed. In roughly the middle of the openness continuum, the settings can be defined as having “spatial definition,” meaning that the setting is relatively open but has some spatial landmarks, such as trees. Both extreme ends of the openness spectrum provide little spatial definition (Kaplan & Kaplan, 1989, pp. 31-34). The settings in the wide-open category generally had the lowest relative preference ratings and settings including views which were blocked received similarly low preference ratings. Contrastingly, the settings which had spatial definition were the spatial configuration category which consistently received the highest preference ratings (Kaplan & Kaplan, 1989, pp. 45-48). The Kaplans theorize that the general preference for settings which have spatial definition is due to a subconscious assessment of the possibilities and limitations that the setting provides for

movement and safety. Both wide-open spaces and settings with blocked views lack landmarks and therefore present a visual similarity which could make it easier to get lost. Settings with blocked views additionally make it harder to both gather information about the environment and to facilitate movement. In contrast, settings which are spatially defined have landmarks, are able to easily facilitate movement, and provide knowledge of the surrounding environment (Kaplan & Kaplan, 1989, pp. 32-37).

In order to further understand scene preferences, the researchers also used an alternative to the CIM Methodology known as the Preference Matrix. Instead of looking at correlations between each scene in the collection of photographs, this method begins by examining the scenes which received the highest and lowest preference ratings and compares them to the factors in the matrix in order to find commonalities between scenes with similar ratings. The Preference Matrix is based on the assumption that “human functioning depends on information” (Kaplan & Kaplan, 1989, p. 50), and much of this information is that which can be learned from the surrounding environment, thus environments which provide particular types of information should be preferred. The Matrix is comprised of two main factors. The first relates to the human needs of understanding and exploration and whether the setting in question affords opportunities for both. The second factor is the availability of the information regarding these two needs and whether it is immediately available or seems like it can be predicted or inferred. The combination of these two factors results in four distinct categories: complexity, coherence, legibility, and mystery. Immediate understanding of an environment results in Coherence. This immediate understanding is present when the

scene has structure and directs the viewer's attention in a particular direction. The opportunity for immediate exploration results in Complexity, and is defined by a high number of elements and intricacy in a scene. Inferred understanding results in Legibility, meaning that the viewer can predict that they would be able to find their way in the scene due to distinctive landmarks. Mystery is defined by inferred exploration, meaning that the viewer can tell that there would be more information about the scene available if they could go further into it. In terms of preference, Mystery and Coherence were better predictors for high preference ratings than Complexity and Legibility. However, out of the four factors, Mystery was the most consistent and significant positive predictor of preference. (Kaplan & Kaplan, 1989, pp. 49-66).

After additional studies which aimed to identify any possible differences in preference between different populations and groups of people, they found that there was much similarity. For instance, there tended to be subcultural differences in preferences for how nature appears, but generally the preference for nature existed across cultures.

Despite all the variations [in different groups' preferences for the scenes], there remain substantial constancies. The strongest of these is the importance of nature itself. The differences among groups have reflected concerns for safety, for order, for apparent human influence, for adventure, for preservation, and for many other qualities. They have not, however, reflected that nature does not matter. Trees and water, flowers and green things, the sense that the plants grow and that they will always

be there – these do indeed seem to be as close to universals as one can find. (Kaplan & Kaplan, 1989, pp. 114-115)

It is in fact remarkable that the preference for nature, albeit with some nuances, is shared across so many different people and circumstances.

In order to integrate and explain the full sum of their studies, the Kaplans came up with an overarching theory of the psychological value of nature. Known as the Attention Restoration Theory, it – in addition to Wilson’s Biophilia Hypothesis – continues to have prominence in the literature today. Drawing on theory from William James, a pioneer in the field of psychology, they suggest that there are two distinct kinds of attention: one which requires effort and one which does not require effort. They have called these two categories “directed attention” and “involuntary attention,” respectively. They propose that directed attention is subject to fatigue, but because involuntary attention is involuntary it is not subject to fatigue and can in fact promote restoration from fatigue. Because directed attention is incredibly important to human functioning, it is important that when this type of attention has become fatigued, it has the chance to become restored (Kaplan, 1995; Kaplan & Kaplan, 1989, pp. 177-196).

The Kaplans propose that there are certain environments which promote restoration from mental fatigue. These restorative environments have four main elements in common. The first is that they have extent, meaning that the environment has depth, richness of content, and a sense of interconnectedness; second, they are compatible with the individual’s purposes; third, they foster the perception of “being away,” either physically or conceptually; and fourth, they are fascinating. Fascination is an important

element of restoration because it engages involuntary attention. Because natural settings easily fit all of these categories, particularly fascination, nature is an excellent candidate for being a restorative environment (Kaplan, 1995; Kaplan & Kaplan, 1989, pp. 177-196).

Besides restoring attention, viewing nature has also been shown to reduce stress. In psychological terms, stress is defined as “the unspecific physiological and psychological reaction to perceived threats to ... physical, psychological or social integrity” (Adli, 2011). Roger Ulrich published a landmark study in 1984 regarding the effect of a view of nature from the windows of hospital rooms of surgical patients. The study was done with surgical patients because they are prone to experiencing anxiety. Ulrich’s hypothesis was that because natural views can foster positive feelings and reduce fear, they might also be able to reduce the stress and anxiety of surgery. Each patient received the same common gall bladder surgery, with 23 patients recovering in a room with a window view of a brick wall and the other 23 patients with a window view of deciduous trees. The study found that there were statistically significant differences between the two groups, notably that patients in the group with a view of trees were hospitalized for a shorter length of time, received less negative notes from nurses, and took less moderate and strong doses of pain medication than patients in the group with a view of a brick wall (Ulrich, 1984). Although in this case the view of nature had a physical effect on participants, it is likely that it was through the mechanism of mental stress reduction.

Ulrich's research primarily focuses on the ability of views of non-threatening nature to better reduce symptoms of stress than views of urban environments (Ulrich et al., 1991). Other findings of his studies include that viewing nature scenes is restorative in the sense that it elevates positive feelings and reduces negative feelings as well as captures attention, which can lead to a reduction of stressful thoughts. Emotions have corresponding physiological states and viewing nature impacts those as well. Viewing nature has been associated with positive changes in blood pressure, muscle tension, and lowered sympathetic nervous system activity. Additionally, these changes can occur relatively quickly, within three to five minutes of exposure to the view of the natural setting (Ulrich, 1981; Ulrich et al., 1991)

Similar to the Attention Restoration Theory, the research on stress reduction can be encapsulated in the Stress Reduction Theory. This theory suggests that because natural settings were important to the survival of our species, we are inclined to experience positive feelings along with a decrease in both negative emotions and stress in natural settings (Sullivan & Kaplan, 2016).

Hartig takes up the Kaplans' theory of restoration and Ulrich's theory of stress reduction, but puts them into a biopsychosocial context. He notes that restoration is the recovery of "physiological, psychological and social resources" which are routinely reduced during everyday living, especially in urban environments. He also references "instorative" benefits, which create resilience for the demands of everyday life and the effects of living in a city (Hartig, 2007, pp. 164-165, as cited in Thompson, 2011).

Several studies have looked for specific psychological impacts of being in nature and have done so by splitting participants into two groups, one in which participants take a walk in a natural setting and the other in which participants take a walk in an urban setting. One study had participants walk for fifteen minutes after being instructed to think about an unsolved life problem. Those who walked in nature showed an increase in attention, positive affect, and had a better ability to reflect on their problem than those who walked in an urban setting (Mayer, Frantz, Bruehlman-Senecal, & Dolliver, 2009). Another study found that natural settings improve cognition. Participants were first surveyed about their mood, then directed to complete a task which involved directed attention, and finally were asked to complete a directed-forgetting task before taking a walk for 55 minutes. Afterwards, they repeated the pre-walk procedures. Performance on the directed attention task significantly improved after participants walked in the natural setting, but not when they walked in the urban setting (Berman, Jonides, & Kaplan, 2008).

A follow-up study done by Berman et al. in 2012 was conducted with the same format of having participants walk in either a natural or an urban environment, but with people who had previously been diagnosed with major depressive disorder. Each participant was instructed to think about an unpleasant and unresolved experience before being randomly assigned to one of the locations to walk in for 50-55 minutes. During the second session, each participant walked in the other location. The study found that cognitive task performance increased after participants walked in the natural environment while it decreased after participants walked in the urban environment. Additionally,

positive affect increased after both types of walks, but it increased more after the nature walks. These results occurred despite the fact that participants were primed to ruminate on unpleasant thoughts before the walks and with the additional finding that participants continued to think about the negative event in both environments. This indicates that something about walking – and something about walking in nature, in particular – is valuable for reducing distress. The authors suggest that this may be due to the restoring of the capacity for directed attention according to the Attention Restoration Theory, but they also note that the mechanism that makes the natural environment more beneficial could be something else like stress reduction (Berman et al., 2012).

A study conducted with four North American military veterans found that their narratives of experience with nature pointed towards the possibility that contact with nature can aid recovery from PTSD and military-related stress, hypervigilance, and distress. The veterans' activities in the outdoors and involving nature included, respectively: rafting, interaction with horses, and trips into the wilderness; climbing and living in the mountains; working in the bush of Canada, canoeing, and working with the Cadets and the Reserves; and farming and walking meditations in the forest. The themes regarding experiences of nature which emerged from the narratives included the importance of sensory experiences, the sense of finding safety in nature and finding purpose and meaning through nature, and that nature was a setting which facilitated social interaction. Sensory experiences were associated with increased feelings of mindfulness. The rhythms of nature were experienced as positive alternatives to the demands of urban life. The veteran who became a farmer, in particular, reported that the

sensory experiences of farming and interacting with the land helped him to move toward recovery. The aspects of safety that the veterans found in nature were being in a space that allowed them to be as they were and which was able to absorb their stress and negatives feelings, which allowed them to feel emotionally safe enough to open up about their experiences. A renewed sense of purpose and sense of confidence was found through experiences in nature for the veterans through interacting with a wider world beyond themselves as opposed to retreating into themselves. Through feeling safe in nature, they were able to reach out and form supportive social relationships. This is important for the healing process because isolation is common with veterans who experience post-traumatic distress and social relationships help to facilitate recovery (Westlund, 2015).

Another study examined how exposure to nature might help veterans recover at a larger scale. The authors partnered with the Sierra Club's Military Families and Veterans Initiative and four other organizations which sponsor outdoor recreation experiences for veterans to administer pre- and post-trip surveys regarding stress, attentional functioning (defined as how effectively people feel like they are dealing with daily activities), mood, tranquility, social functioning, and life outlook. Post-test ratings were significantly higher than pre-test ratings for attentional functioning, positive affect, and tranquility and were significantly lower for negative affect. These results mostly occurred in a subcategory of veterans who noted during the pre-trip survey that they frequently experience disruptions in their everyday life due to physical or mental health issues. Significant differences were found across all veterans for social functioning and life outlook between pre- and post-

test surveys, meaning that they experienced increased feelings of social connectedness, experienced less isolation, and had a more positive outlook on life (Duvall & Kaplan, 2014).

It is important to understand the mechanism or mechanisms behind the psychological benefits of nature. After all, if the mechanism is unrelated to nature itself, then nature is perhaps not the element worth being either studied or put into practice. However, several studies have found that the effects of nature transcend other possible mechanisms, suggesting that there is in fact something beneficial about nature itself. De Vries et al. (2013) conducted a study to tease apart several possible mechanisms which could explain the relationship between vegetation visible from urban streets and health. These mechanisms were stress reduction, physical activity, and facilitation of social contact. They found that stress reduction and social cohesion were the two most important factors (de Vries, van Dillen, Groenewegen, & Spreeuwenberg, 2013). Another study found that physical exercise alone does not account for all of the benefits of exercise in a natural space (Pretty, Peacock, Sellens, & Griffin, 2005).

Urban Nature

The Kaplans also focused on “nearby nature” as part of their research program, which they loosely defined as spaces which are dominated by or include a significant amount of vegetation and are near to where people spend time, usually in terms of residences. These settings include spaces like parks, streets lined with trees, backyards, landscaped areas, unused lots, and gardens (Kaplan & Kaplan, 1989, p. 151). Because

most people live in cities and the nature that is nearby is likely to be urban, nearby nature is essentially a synonym for urban nature.

One of the defining characteristics of wilderness is that it has extent, which means that it has a sense of vastness about it. In contrast, nearby nature – or nature in an urban context – is unlikely to be vast due to the constraints of the city. However, the actual size of natural spaces turns out to have little importance in urban nature settings. Generally, preference for urban nature was unrelated to the size of the setting. In fact, in some situations people actually preferred smaller areas, likely due to a fear of attackers and the associated possibility that there is more to fear in more open areas. It is possible that perception of extent is more important than the actual size, but that people like being able to access intimate spaces as well as wide open spaces (Kaplan & Kaplan, 1989, pp. 152-154).

One of the most important aspects of urban nature is its proximity to where people are, primarily where they live and work. Nearby natural spaces will not be used unless they are very nearby indeed. A three minute walk has been suggested as the benchmark for what is considered “nearby.” If the closest nearby space is longer than a three minute walk away, it is likely that the inconvenience of getting there will overwhelm the desire to be there (Alexander, Ishikawa, & Silverstein, 1977, p. 305, as cited in Kaplan & Kaplan, 1989, p. 155).

Perhaps the most important context for urban nature is that which is located in and around neighborhoods. Studies about neighborhood satisfaction have found that nature is a salient category in satisfaction. Presence of, access to, and proximity of elements of the

nearby natural environment were predictors of participants' satisfaction with their residences (Kaplan & Kaplan, 1989, pp. 158-161). In one study, the strongest predictor of residential satisfaction was ease of access to nature (Fried, 1982). Remarkably, another study found that residential satisfaction was positively correlated with life satisfaction, thus linking the presence of and interaction with nearby nature to overall life satisfaction (Kaplan & Kaplan, 1989, pp. 159-160). The Kaplans propose that their results "suggest that nature that is most immediately available does, in fact, make the most difference" (Kaplan & Kaplan, 1989, p. 161). It is a noteworthy finding that the presence of nearby nature has such a striking effect on neighborhood satisfaction while neighborhood satisfaction in turn has such a striking impact on general well-being.

Although active use of nearby nature is often presumed to be the only form of use, more passive uses of nature have shown to be valued as well. This includes both having a view of nature out of the window and the knowledge that there is a natural space nearby. Several studies have found that an indoor setting with windows is preferable to one without windows. A study about the content of window views found that views of nature, particularly in the form of 'unmanaged woods,' were preferred. The findings also indicated that having a view of the built environment did not affect participants' self-reported well-being, but having a view of nature did, due to higher ratings for effective functioning and feeling at peace and lower ratings for distraction (Kaplan, 2001). Additionally, just the knowledge that there is nature which is nearby enough to access plays a role in satisfaction. It is not only actual use of nearby nature which is important,

but also the knowledge that one can potentially use an area of nearby nature if and when they would like to do so (Kaplan & Kaplan, 1989, pp. 155-157).

Nearby nature also can facilitate social cohesion. A correlational study done at Chicago public housing developments found that people tended to gather more in spaces that contain nature in the form of trees, as compared to spaces without trees. This phenomenon increases opportunities for forming social relationships, aids in communal monitoring of common areas, and creates safe spaces for children to spend time in (Coley, Sullivan, & Kuo, 1997). An interview-based study conducted with elderly public housing residents found that residents who had more exposure to common greenspace experienced a greater sense of community and felt that they had stronger social relationships than those who used green common spaces less. Presence of green common areas is a prerequisite for being able to use them. (Kweon, Sullivan, & Wiley, 1998). Additionally, vegetation which is not so dense as to prevent visibility – similar to the Kaplans' designation of spatial definition – plays a role in reducing neighborhood crime (Kuo & Sullivan, 2001). Because humans are social beings, social cohesion and strong social relationships are important to individual well-being.

Additional research indicates that nature in a specifically urban context also has beneficial effects, rather than dichotomizing natural and urban environments. And in fact, the psychological benefits of nature, specifically its capacity to reduce stress, become incredibly important in the context of cities. Urban living puts people at a 20% higher risk of having an anxiety disorder, a 40% higher chance of having a mood disorder, and twice the risk of schizophrenia as compared to rural living (Peen, Schoevers, Beekman, &

Dekker, 2009). Higher risks for psychological disorders occur at least in part because of increased stress exposure, especially social stress due to high population densities. Other reasons living in a city can be stressful include not having enough space and experiencing insecurity, economic or otherwise. This stress remains a prominent factor of urban living despite the fact that cities have better infrastructure and healthcare services than rural areas (Adli, 2011).

One way of measuring stress is through cortisol levels. One study, in contrast to both laboratory and field experiments, instead sought to examine the link between nature and stress in everyday environments. To this end, the researchers analyzed amounts of greenspace in neighborhoods with relatively low socioeconomic statuses and measured cortisol levels of participants who both lived in those neighborhoods and were not employed at the time. Cortisol levels are part of the circadian cycle, and so levels of cortisol are meant to shift throughout the day. With regards to healthy cortisol secretion, levels should peak shortly after waking up and steadily decrease throughout the day, ending with a low level in the evening. Contrastingly, less of a decline in cortisol levels throughout the day is associated with a range of physical and mental health issues. Participants gave saliva samples in the morning and in the evening over the course of two days. Data analysis revealed that there was a significant positive correlation between the daily decline of cortisol levels and percent of greenspace, meaning that more neighborhood greenspace was correlated with healthier cortisol secretion patterns (Thompson et al., 2012).

Preferences studies have been done with regards to urban nature as well. Although it is clear that people generally prefer scenes which are dominated by nature content, scenes of urban nature are also generally preferred over scenes of only urban content. Honeyman conducted a study that looked particularly at vegetation in the built environment, and thus directly looked at urban nature. Participants were shown scenes of the urban built environment with and without vegetation as well as scenes of only nature. The study found that the scenes with vegetation were more impactful on mental restoration than the scenes without vegetation. Somewhat surprisingly, the study also found that the scenes with urban vegetation had a greater beneficial psychological impact than the scenes only containing nature (Honeyman, 1992, as cited in Hynes & Howe, 2002).

There is some interesting correlational evidence that urban nature is linked to mental health. In one study, urban nature measured by residential street tree density was shown to be inversely correlated with prescription rates for antidepressants (Taylor, Wheeler, White, Economou, & Osborne, 2015). In another study, better scores on a mental health survey were correlated with shorter distances from homes to urban parks (Sturm & Cohen, 2014). A third study found that more total neighborhood green space and shorter distances to usable neighborhood green space were correlated with decreased treatment for mood and anxiety disorders (Nutsford, Pearson, & Kingham, 2013). An interesting study which began to elucidate causation in this realm found that people who moved from less green areas to more green areas had sustained increases in mental health after they moved (Alcock, White, Wheeler, Fleming, & Depledge, 2013).

One possible mechanism for these mental health impacts is a decrease in rumination. Rumination is a common problem associated with mood disorders and is defined as a tendency to engage in a repetitive and maladaptive thought. A study by Bratman, Hamilton, Hahn, Daily, and Gross found that walking in a natural setting decreased self-reported rumination as well as the neural activity associated with it while walking in an urban setting did not have the same effects (Bratman et al., 2015).

Remarkably, despite the psychological benefits of increased contact with nature – and specifically urban nature – people are likely to undervalue its positive effects. Two studies done by Nisbet and Zelenski (2011), based on research which found that people often make forecasting errors when predicting how events will make them feel compared to how they actually feel after the event happens, hypothesized that due to modern society's disconnection with nature, people would be likely to underestimate its hedonic benefits. Their first study used two walking routes, one of which was a route through underground tunnels and the other was along a walking and biking path. Their participants were randomly assigned to be either forecasters or experiencers. Forecasters received a description of their route, which was either indoor or outdoor, and were asked to rate how they expected to feel after they finished the route. Both forecasters and experiencers then walked their respective routes but only the experiencers were asked to rate their affect after the walk. As compared to experiencers who were assigned the indoor path, the experiencers who were assigned the outdoor route reported less negative affect and more positive affect as well as higher relaxation and fascination. Additionally, outdoor forecasters predicted lower mood ratings than outdoor experiencers reported and

indoor forecasters predicted higher mood ratings than indoor experiencers reported after each group walked their respective routes. The second study was a replication of the first but used different walking routes and had the same participants both forecast their affect before the walk and report their affect after the walk. The findings also were replicated in this study; participants who walked outdoors underestimated the positive affect they would experience due to their walk and participants who walked indoors overestimated positive affect (Nisbet & Zelenski, 2011).

Urban Gardens

Urban nature, in addition to nature-dominated spaces, has been shown to be psychologically beneficial for human well-being. Gardening, because it is a form of engagement with nature, should have the potential to be even more psychologically beneficial than more passive forms of urban nature. Urban gardens are defined simply as gardens that are cultivated within cities. They fall into two primary categories: private residential gardens and community gardens. Community gardens are typically spaces where different people each have their own plot or raised bed within the larger garden, although sometimes they refer to collaborative gardens which are cultivated by a community of people together. Additionally, the purposes of gardens can vary. The principle variation is whether they are cultivated for aesthetic purposes or in order to grow food. Of course, oftentimes gardens are cultivated for both purposes, as well as simply for recreation.

The Kaplans conducted several studies about gardening as part of their research program, including research on both residential gardening and community gardening.

They found it interesting that gardens and gardeners are so variable and span many segments of the population:

Gardens can come in many sizes and can be grown in many places – even on rooftops. There is probably no single nature-based activity that is so widely shared by the population. People who garden come in every color, size, shape, nationality, and income level. People garden whether they live in rural areas, in the suburbs, or in the innermost, built-up, teeming portions of cities. They do it individually, in family groups, or as part of a community.

In fact, gardening is an amazing phenomenon. Why should this activity be so popular? Certainly, the opportunity to grow fresh vegetables and fruits is an attraction. But many gardeners do not grow edibles. Furthermore, there is no guarantee that one's efforts will bear fruit. Marauders, human or otherwise, are no trivial threat. The weather is a further unpredictable element with threat potential. There are plenty of other negatives to this activity: it is hard work and gets one dirty, sweaty, and achy. It is potentially expensive. It is often hard to know how much to plant. The garden needs so much attention and often looks messy nonetheless.

Despite all this, gardens spring forth everywhere, and the legions of gardeners grow as do their plots. It is worth examining this kind of contact with nature more closely. (Kaplan & Kaplan, 1989, pp. 163-164)

Seen in this light, gardening seems to be a curious phenomenon, so what could be driving participation in it?

In her earliest research on gardening and what appears to be the very first psychological study about gardening, Rachel Kaplan surveyed community and home gardeners about the satisfactions and benefits they received through gardening. Analysis of the survey responses found that the benefits of gardening could be divided into three categories: primary garden experiences, sustained interest, and tangible benefits. Primary garden experiences included factors such as the desires to work with soil and watch plants grow; the sustained interest scale included factors such as the sense that gardening was a valuable way to spend time and that it is interesting; and the tangible benefits scale was about producing food and decreasing the cost of buying food. Home gardeners had higher satisfaction ratings and scored significantly higher on the sustained interest scale than community gardeners, although there was no difference on the primary garden experiences and tangible outcomes scales. Of the three scales, the sustained interest scale had the highest overall mean rating. Within the home gardener category, those who grew vegetables scored higher on the tangible outcomes scale and those who grew flowers scored higher on the sustained interest scale. Additionally, older and more experienced gardeners tended to grow flowers over vegetables. Taken together, these results suggest that fascination and interest in the nature components of gardening may be positively correlated with number of years spent gardening (Kaplan, 1973).

A study done by the Kaplans with members of the American Horticultural Society and readers of a magazine called *Organic Gardening and Farming* examined sources of

satisfaction in gardening. For both population samples, the source of largest satisfaction was the peacefulness and quiet that gardeners experienced in the garden, which received higher ratings than tangible benefits like producing food and saving money. This points to the role of fascination, specifically nature fascination, in gardening (Kaplan, 1983, pp. 149-152).

Subjectively, people who garden report that they find it important for their mental health and well-being. A survey of Philadelphia community gardeners asked them to identify the most important reason that they garden and 19% responded with mental health. This was the second largest category, coming in second only to recreation at 21% (Blair, Giesecke, & Sherman, 1991). A different survey of community gardeners asked questions based on Maslow's Hierarchy, the order of which begins with physiological needs, and then proceeds to safety, belonging and social needs, esteem, and self-actualization. Most of the gardeners surveyed reported that gardens and gardening met needs in all of the categories (Waliczek, Mattson, & Zajicek, 1996, as cited in Hynes & Howe, 2002).

Objectively, gardening has been shown to be stress-relieving due to decreases in cortisol levels. A study by van den Berg and Custers (2011) had thirty gardeners perform a stressful task, after which they either gardened for 30 minutes or read for 30 minutes. Although both gardening and reading led to cortisol decreases, the decreases were more significant for gardening. Participants were also asked to self-report their mood. Participants in the gardening group reported a fully restored positive mood after

gardening while participants in the reading group reported a lower mood after reading (van den Berg & Custers, 2011).

A study done with community/allotment gardeners with non-gardeners as a control group surveyed participants about their self-esteem and mood. Gardeners were surveyed both before and after a gardening session while non-gardeners were surveyed only once. The study found that gardeners' self-esteem scores saw a significantly different increase after the gardening sessions. There were significant differences in mood subscale scores including decreases in tension and anxiety, depression and dejection, and confusion and bewilderment. Additionally, overall mood was improved. These mood and self-esteem improvements were not significantly different between participants who had been gardening for a long time and participants who had been gardening for only a short time, suggesting that the benefits begin right away and do not decrease over time (Wood, Pretty, & Griffin, 2015).

Exposure to gardens also has the potential to improve quality of life for patients with dementia. A scoping review which analyzed sixteen studies regarding sensory gardens, horticultural therapy, therapeutic horticulture, and the use of indoor plants found that generally these interventions were beneficial for patient well-being, behavior, affect, and functionality (Gonzalez & Kirkevold, 2013).

Similar types of horticultural and garden interventions have also been shown to be beneficial for individuals with psychiatric illnesses such as schizophrenia, bipolar disorder, and major depression. The study was conducted with twenty four participants at a rehabilitation center. Participants in the control group attended job skills training

sessions including indoor and outdoor tasks while participants in the horticulture group attended horticulture activity sessions for one hour before joining the rest of the participants in the training sessions. The study found that participants in the horticulture group reported that they experienced emotional benefits like stress relief. They also measured depression, anxiety, and stress subscales and found significant differences in all three areas between the horticulture group and the control group (Kam & Siu, 2010).

Gardening as an occupation, one of the ways that horticultural therapy can be applied, has been shown to be beneficial for people who have mental disorders and are otherwise vulnerable in or marginalized by society. Not only was being in the natural environment of a garden stress-reducing and peaceful for the interviewees, but gardening as an occupation gave people a sense of meaning and purpose, which contributes to wellness. Additionally, interviews with people who have serious mental health problems and had been involved in a horticultural therapy program with a community mental health team found that participants felt that gardening offered them safety and stability and that the activity of gardening was destigmatizing through the formation of a positive identity and increased social cohesion (York & Wiseman, 2012).

Gardening, particularly community-based gardening, has been shown to be beneficial for the creation of social relationships between individuals living in proximity to each other, such as in a neighborhood. These informal social ties can help facilitate positive social processes such as collective efficacy and neighborhood attachment, as well as increase neighborhood satisfaction and sense of belonging, factors which are important for general well-being. Based on this research, a cross-sectional study

conducted by Comstock et al. both surveyed residents of Denver neighborhoods about factors related to their neighborhood attachment and audited the street environment near where each participant lived. The focus of the study was to elucidate the impact of gardening on neighborhood attachment. In addition to being asked about demographic data such as length of residence in the neighborhood, home ownership and race/ethnicity, participants were asked if they participated in community gardening, backyard gardening, container gardening, or if they gardened in a neighbor's yard. Participants were surveyed about their level of neighborhood attachment, perceived safety, collective efficacy, and perceived incivilities in the neighborhood. All types of gardening were positively associated with neighborhood attachment, as compared to measured neighborhood attachment levels of non-gardeners, although community and backyard gardening were the primary forms of gardening in which residents participated. The authors suggest that this is because gardening has a particular capacity to foster positive place attachment because it is both affordable and accessible for people of different backgrounds, it requires active engagement, and it facilitates formal and informal social interactions with others (Comstock et al., 2010).

A study regarding the impacts of community gardening on collective efficacy, which is defined as “the link between mutual trust and a shared willingness to intervene for the common good of the neighborhood” conducted by Teig et al. (2009) sought to illuminate what kinds of social processes community gardeners describe and what the relationship is between those social processes and the activities that occur in community gardens. The authors interviewed 69 gardeners affiliated with Denver Urban Gardens.

The social processes that the gardeners described involved social connections, reciprocity, mutual trust, collective decision-making, social norms, civic engagement, and community-building. Gardeners were both attracted to garden membership and continued to participate in the garden because of the opportunities for social interaction. Members found that through these social interactions, they developed tighter-knit relationships in which reciprocity was valued within the garden as well in other contexts. The garden led to members feeling trust amongst each other and safety within the garden.

Communication and collective decision-making were seen as instrumental aspects of making the garden work for everyone. Oftentimes positive social norms were established within the gardens. Community gardening also was represented as a factor in civic engagement as most gardeners also voluntarily participated in other community efforts. Gardeners also reported donating extra produce to people in need, the formation of mentoring relationships, and gardening as an activity that catalyzed collective participation in neighborhood issues like land insecurity and crime. Gardeners also experienced the garden as a place which built community between diverse people who nonetheless created a place where everyone could belong. Taken together, the social processes described by the gardeners allude to collective efficacy, which may be a mechanism that supports health through social support. Additionally, the positive effects of the garden often ripple outwards into the larger community (Teig et al., 2009).

In addition to the psychological benefits that can be gained through gardening, it has been shown that gardening is an activity which can engage people with nature. A study conducted in New Zealand sought to determine the nature of the relationship

between people and their domestic gardens as a form of urban nature. As much as 86% of the population of New Zealand lives in urban areas and in the city in which the study was conducted 36% of urban land and 46% of residential areas is comprised of gardens. The authors suggest that domestic gardens are an important way of experiencing nature for urban dwellers. They are interested in “the relationship between gardening, well-being and contact with nature.” To this end, their research questions regarded why gardens matter to the people who cultivate them and if/why these gardens can facilitate gardeners’ connection to nature. Every participant in the study placed importance on their garden. Participants said that they gained both physical and psychological health benefits through gardening. Psychological benefits which the participants referenced included having something interesting to do and self-worth through self-sufficiency, as well as broader statements regarding how it brings happiness, pleasure, and is soothing. Participants also found their garden to be a place which was apart from stress, particularly work stress. 53 out of 55 households reported that they used their garden for relaxation purposes. Participants expressed ownership and identity through how they changed and created their gardens. Gardening was overall seen by participants as a way of “learning to care about life,” nature, and the environment. Participants found value in being productive in their gardens, specifically in growing produce. Gardening can be a solitary or a social activity, and participants found that they developed social relationships through gardening. The authors suggest that connections to nature, stated both explicitly and implicitly, are reflections of E. O. Wilson’s Biophilia Hypothesis (Freeman, Dickinson, Porter, & van Heezik, 2012).

A similar study conducted in the UK sought to understand the intersection of gardens and meaning based on the theory that residential gardens are extensions of the home. Through interviews with participants, the authors found three themes regarding the meaning of gardens: escapism, ownership and identity, and relationships. Participants described their gardens as places where they could escape from the anxieties of their lives. Some participants reported gardens in their childhoods being a place in which they could explore and play, which the authors suggest could be representative of the capacity of engagement with the natural world to provide a sense of freedom/space to young children. Young adult participants reported finding pleasure in outdoor activities besides gardening, although the reasons that they enjoyed these other outdoor activities were remarkably similar to the responses of people who enjoyed gardening. Adult gardeners reported valuing gardening because it is an activity in a pleasurable setting which could absorb their attention as well as provide “seclusion and distraction from reality.” They reported losing sense of time in the garden, which contributes to the feeling of escape from worries. Gardeners also reported choosing the garden as a setting in which they managed issues including emotional regulation. In terms of ownership and identity, participants in the study saw the garden as being part of their homes. Cultivating a garden may be a way of forming place attachment, which home ownership also can form. Gardens allow for displays of identity and creativity and the gardeners often created their gardens in ways that they personally found meaningful. Positive outcomes of owning a garden included “satisfaction, comfort, privacy, pride, status, and creativity.” The garden provides a context for relationships as well – specifically relationships with nature and

other people. Gardeners reported feeling fulfilled through their relationship with nature via their garden through activities such as providing opportunities for wildlife to engage in their garden space. Additionally, many gardeners saw themselves as being in a reciprocal relationship with nature. They expressed the need to adapt to nature and care for it, rather than try to control it. Social relationships were also important in the garden. For many adult gardeners, the garden provided a place to remember and maintain memories of and relationships with people (Gross & Lane, 2007).

Similar to these findings, the Kaplans assert that participation with nature, rather than control of nature, is the process in which gardeners engage: “though the gardener can exert some control, despite the best intentions plants do not always heed such instructions. In fact, experienced gardeners often find the plants do some of the controlling” (Kaplan & Kaplan, 1989, pp. 166-167). One of the most measurable aspects of control is gardeners’ use of chemical fertilizers. A need for control in the garden can cause people to favor chemical interventions in the garden over organic methods. The study referenced earlier which surveyed members of the American Horticultural Society (AHS) and readers of a magazine called *Organic Gardening and Farming* (OGF) and examined sources of satisfaction in gardening found an interesting result regarding the use of chemical interventions versus organic methods. The AHS members who reported use of chemical fertilizers in their gardens had lower satisfaction ratings in each category as well as lower life satisfaction ratings than AHS members who reported that they used either both organic and chemical fertilizers or only organic fertilizers (Kaplan, 1983, pp. 152-153). This finding is correlational, not causal, but it is consistent with the idea

that partnership with nature is more beneficial for humans than ecologically harmful engagement with nature.

Conclusion

Many studies have documented psychological benefits of nature, ranging from wilderness to urban vegetation to engagement with nature through gardening. Although wilderness is the most popular form of nature sought for restoration purposes, various studies have documented that nature in an urban context is restorative as well. Exposure to nature has the capacity to increase well-being through mechanisms like stress reduction, relaxation, and satisfaction, but it also has the capacity to alleviate suffering in those who have mental disorders. Nature in an urban context is particularly important because urban living has been shown to have particular stresses which nature is well-suited to alleviate. Additionally, it is significant that wilderness experiences and urban gardening have several psychological benefits in common, namely that they are both activities which can improve self-esteem and produce feelings of restoration. These are benefits that merely observing nature in an urban context cannot necessarily provide, which suggests that gardening in an urban context may be more important than the mere presence of vegetation in an urban context. Views of nature are good, but engagement with nature is better. There is even some evidence to suggest that psychologically, methods of gardening which put the gardener in a partnering relationship with nature are better in terms of psychological impact than methods which gardeners use to exert control over nature.

Contact with nature helps us to be more whole people and can be of fundamental importance in having a meaningful life. Reduction of stress, improvement of mood and self-esteem, and increased attention and cognition all increase effective human functioning and it is significant that exposure to nature – and specifically gardening – can accomplish all of them.

There are several overarching theories about the psychological value of nature, each of which has aspects of speculation. However, even though there is no one conclusive theory, we can still see documented benefits of the value of nature for people's psychological well-being in many studies. It is clear that nature, including urban forms of nature, is important for human psychological well-being. Less clear, however, are the implications of the literature for how individuals, cities, and indeed our whole culture should act regarding nature as a whole and urban nature and gardens specifically.

Chapter Three

Implications

“We all live someplace. We all occupy an environment, regardless of whether it is characterized by pavement and high-rises or rocks and trees.

We’re all engaged in a lifelong negotiation with soil and air and people and water and plants and nonhuman animals.”

~Andrea Jones (2013, pp. 12-13)

In the previous chapters, I have presented two distinct cases for valuing urban gardens as a form of nature. The first case is philosophical and defines nature through the lens of “wildness” in order to include forms of nature beyond wilderness. Additionally, gardening presents an opportunity for a fulfilling relationship with nature even within a city through partnership rather than control. The second case is psychological. Although wilderness spaces are thought to be excellent for purposes of restoration, they are not the only forms of nature which have psychological benefits. Even the nature closest to people in the city can have important benefits, and gardening even more so. Hence, there are both philosophical and psychological grounds for the validity of experiencing nature in an urban context.

I will note again that physical wilderness is important for the preservation of species and ecosystems. On the other hand, the concept of wilderness – although seemingly fundamental to American thought regarding nature – is flawed and has some problematic aspects. We seem to desperately want wilderness to be untouched and pristine, but this simply is not possible. Another major problem with the American conception of wilderness is that it was born out of a failure to live with the wildness of

the natural world. Because of this, perhaps the greatest flaw in the concept of wilderness is that it separates nature and culture into two very distinct categories. If defined this way, nature cannot be part of daily life and therefore must be reserved for special occasions when it can be purposefully sought out.

While wilderness is undeniably important and should be valued, the idea that wilderness is the only valid form of nature is not enough. If we value nature only in the context of wilderness, we are categorically undervaluing every other type of nature. Instead, it would be beneficial to value nature in the context of the places that we actually live, instead of only in places which are set aside. Although this can mean valuing rural settings or rather undeveloped settings, many people live in cities and thus urban nature needs to be considered and valued also. However, we do not have enough concern for nature that is not found in wilderness. We should also care about the nature found in agricultural systems, on farms, and in rural areas as well as the nature found in cities and suburban areas in places like parks, backyards, and along streets. We need to take seriously the idea of wildness in addition to the idea of wilderness.

That nature plays a role in psychological well-being is clear from the literature even though the field has farther to go in establishing precise mechanisms, causal relationships, and ideal doses. Exposure to nature, even in an urban environment, has the capacity to reduce stress, improve mood, increase our satisfaction with the places that we live and work, and contribute to social cohesion. Gardening in particular encourages

fascination with nature, facilitates restoration and relaxation, and also improves self-esteem and mood.

Yet access to nature, like access to many other resources and amenities in this world, is an issue of justice. Everyone should have access to nature, yet this is not always the case. When nature is defined as being synonymous with the wilderness or wilderness-like spaces, people who live in cities and for any reason find it difficult to leave are, by definition, unable to access nature. Many people who are marginalized by society fall into this category, especially people who are experiencing homelessness and poverty. It takes time, transportation, and resources to be able to have a wilderness experience and even to spend time in a natural area outside of the city. Lacking any one of these three things makes it difficult to do so.

Access to urban nature is problematic as well. Urban nature is unequally distributed within cities, particularly with regards to race and class. Neighborhoods in which residents have higher socioeconomic status and are predominantly white are more likely to contain urban nature in such forms as green spaces, parks, and trees than neighborhoods which are predominantly communities of color and in which residents have lower socioeconomic status. Furthermore, investment in the greening of spaces in areas which have traditionally been disinvested in, like the inner city, is likely to result in gentrification and thus the displacement of the very people who were supposed to benefit in the first place. The creation of gardens is also likely to contribute to gentrification (Shanahan et al, 2015; Wolch, Byrne & Newell, 2014).

Living in a city can be stressful for a number of reasons and urban stresses affect those experiencing poverty more so than those who have a higher socioeconomic status. Nature, and particularly gardens, have much to offer in terms of improvements to well-being, especially for marginalized populations. These are the people who stand to gain the most from the benefits of urban nature and the opportunity to garden, yet they are much less likely to have opportunities to access urban nature and gardens.

In light of these issues and the knowledge that urban nature is indeed of psychological importance, we must ask the Jesuit question, “How ought we to live?” The implications of the psychological aspects of nature in an urban context are many and can occur on several levels. The first is the level of the individual. What can an individual living in a city do to encourage and actively participate in urban nature? The second level is that of policy, what the governmental institutions we have in place could do to improve urban nature in cities. The third level is cultural and is that of a cultural shift regarding the way our whole society views and interacts with nature.

On an individual level, we can broaden our view of nature. We can expand it to not only include the category of wilderness, but to also include that which is wild, even in the city. We can go outside more and intentionally spend time being exposed to urban nature, both because it will likely benefit us, but also so that we might notice and appreciate that which is other-than-human in a landscape which is dominated by human-made objects. It is worth noticing the flower growing in the crack of the sidewalk, the tomato plant growing in the garden across the street, and the seasonal cycles of the tree

growing in the park. Wonder lies not only in the vast and untamed wilderness, but also in the much smaller forms of urban nature. There are whole worlds even in the soil if we would so much as look and wonder at them. We can seek to create urban nature as well, through participating in the wildness of nature by planting gardens and tending them responsibly. As individuals, we can notice nature, appreciate it, fight for it, protect, and create more of it.

On a policy level, we should be actively planning to incorporate urban nature into all areas of cities. Because nearby nature is so important, everyone should have access to it, not just a privileged few. As the Kaplans realized,

The issues here are not simply semantic. The failure to recognize the satisfactions and benefits that the nearby natural setting can offer has important consequences. It means that all too often landscaping is considered merely an optional ‘amenity.’ Having green things nearby is undeniably peasant but is often deemed less essential than all that is subsumed by ‘infrastructure.’ Noteworthy architectural monuments rise in the cityscape, but funds run out before the landscaping plan can be put into effect. Public housing projects can often be spotted quickly by the total lack of nearby vegetation. The possibility for gardening is all too rarely afforded residents who do not own a single-family home. (Kaplan & Kaplan, 1989, p. 150)

It is important that city planning includes attention to urban greening and that this attention is given to areas which have traditionally been disinvested in. This planning needs to be done extremely carefully, however, so as not to cause gentrification. One approach is to develop strategies for creating urban nature which is “just green enough.” This could mean working on environmental restoration or cleanup without using buzzwords that attract developers. It also could mean that there is collaboration between local residents and city planners so that everyone is on the same page regarding what is best for the community (Wolch, Byrne, & Newell, 2014; Curran & Hamilton, 2012). Another avenue towards limiting the effects of gentrification is ensuring that adequate affordable housing is available in areas which are vulnerable to gentrification or are becoming gentrified (Levy, Comey, & Padilla, 2006, p. 3).

Additionally, because nearby nature has its optimum benefit when it is very nearby, it should be prevalent in cities so that it is very nearby for everybody. Since people have a tendency to undervalue the positive effects of nature, the authors of the study which found that people make forecasting errors regarding the impact of nature on mood wryly suggested that “given our participants’ failure to anticipate the benefits of contact with nature and their apparent behavioral avoidance of it (as indicated by the relatively frequent use of the indoor tunnels on our campus), urban nature might best be made unavoidable, rather than tucked away in parks” (Nisbet & Zelenski, 2011). Urban nature would simply be more effective if it was located more extensively throughout cities because then people could not help but come into contact with it more often.

Additionally, since spatial definition and mystery are the traits that appear to be most preferred in nature scenes, these are the traits which should be incorporated into the design of urban nature.

Gardens also should be promoted by policy and incorporated into city planning. Community gardens can be promoted through policies such as allowing vacant land to be used by and for the community, creating zoning codes which require open spaces that can be used for community gardens, setting goals for a ratio of gardens to households in neighborhoods, putting city funding towards community gardening programs, and protecting community gardening sites from development. Zoning codes which relax restrictive landscaping requirements allow both front yard gardens and community gardens to exist in more places. Additionally, policies can promote outreach for garden involvement to marginalized populations including people experiencing poverty, low-income families, people who have mental health challenges, elderly populations, and people who have disabilities (Division of Agriculture and Natural Resources, University of California, 2008). Gardens deserve more city planning support for their diverse array of benefits.

On a cultural level, our society needs a cultural shift regarding the way we view nature. Our culture as a whole has lost touch with what it means to live with nature instead of in opposition to it. As humans, we depend on the processes of nature for our very life, but “emphasizing boundaries and venerating the pristine perpetuates the false notion that nature is a place that has little to do with our day-to-day lives” (Jones, 2013,

p. 70). Food, water, air, and the materials we use to build our shelters and our possessions all come from the earth. Even our most technological of endeavors rely on the earth as it is precious minerals and metals that allow computers and all aspects of technology to function. Our society has created a disconnect here. Although we rely on the earth for life, because we do not have to interact with the natural environment to survive, we oftentimes have a hard time seeing that we do in fact rely on the earth for life.

Our culture also has a tendency to want to dominate nature rather than to work with it. This domination oftentimes ends in degradation and destruction. I think that the demonstrated preference for natural environments over built environments is indicative of our intuitive knowledge of this. We know that our way of life is destructive for the land and so we do not want to be reminded of it; we would rather be in places which show no or minimal signs of our own presence and lifestyle. But what if we were able to change this? What if we were able to look at the land we have lived on and find it beautiful? Valuing, protecting, and increasing urban nature is an avenue towards doing this. When we hold wilderness in high esteem, to the extent that we feel like we belong there more than in civilization, “we give ourselves permission to evade responsibility for the lives we actually lead ... [and] forgive ourselves the homes we actually inhabit” (Cronon, 1995, p. 81). By honoring other forms of nature beyond wilderness, we can begin to make more hospitable and responsible the homes we actually inhabit.

We have a responsibility to live with nature instead of in exploitation of nature, thus to live in a way that integrates nature and culture. For American society, this is a

radical proposal indeed because collectively we are so separated from the land and from nature. That getting one's hands in the soil, participating in the processes of growing, and knowing the cycles of nature is, to a large degree, counter-cultural is problematic. Equally, dichotomizing nature and the city is dangerous. It implies that nature is always "other," that humans cannot fully participate in nature and are therefore, at most times, alienated from nature. But this understanding of nature also alienates people from their very selves – born of nature and dependent on natural processes for survival. If we do not care about nature, we ultimately do not care about ourselves.

An ideal solution would be to shift our culture so that it operates more like the cultures of indigenous peoples with regards to living with the land. However, this is frankly unrealistic. It is unlikely that our framework of society can be changed so drastically, but we can seek to increase indigeneity, so to speak. We can work on becoming re-localized to the specific places and the natural contexts that we inhabit through learning about them, participating in them, and seeking to meet our material needs, especially that of food, as locally as possible.

Although shifting culture is an immense task, making our everyday city environments more habitable via the presence of nature is an easier undertaking and is an imperative. It will improve people's daily lives, making it less necessary for people to seek restoration in faraway places. It will resolve the disconnect that we have created by seeking to save and protect faraway spaces at the same time as we have neglected to put the same kinds of investment and care into our daily spaces. This neglect is a cultural

failing. Our insistence that we protect wilderness is partially rooted in acceptance of the desecration of the places we actually live in. If we saw ourselves as part of nature, we would not have such a cultural need for the wilderness. Scientific arguments for the necessity of wilderness still apply, but our longings to be in touch with nature could be satisfied by the places in which we reside.

I contend that the best way we can do this is through gardening where we live, and doing so responsibly. Gardening, even in the middle of a city, is a way of engaging with nature in our everyday lives and there are clear psychological benefits associated with this. Additionally, the processes of gardening and interacting with plants and the land in a way that collaborates with nature is an avenue towards thinking more deeply about nature and how we both personally and culturally interact with and think about it. These are the values of regarding urban gardens as a form of nature.

References

- Adli, M. (2011). *Urban stress and mental health*. Retrieved from <https://lsecities.net/media/objects/articles/urban-stress-and-mental-health/en-gb/>
- Aktar, W., Sengupta, D., & Chowdhury, A. (2009). Impact of pesticide use in agriculture. *Interdisciplinary Toxicology*, 2(1), 1-12.
- Alcock, I., White, M. P., Wheeler, B. W., Fleming, L. E., & Depledge, M. H. (2013). Longitudinal effects on mental health of moving to greener and less green urban areas. *Environmental Science and Technology*, 48, 1247-1255.
- Berman, M. G., Jonides, J., & Kaplan, S. (2008). The cognitive benefits of interacting with nature. *Psychological Science*, 19(12), 1207-1212.
- Berman, M. G., Kross, E., Krpan, K. M., Askren, M. K., Burson, A., Deldin, P. J., Kaplan, S., Sherdell, L., Gotlib, I. H., & Jonides, J. (2012). Interacting with nature improves cognition and affect for individuals with depression. *Journal of Affective Disorders*, 140, 300-305.
- Blair, D., Giesecke, C. G., & Sherman, S. (1991). A dietary, social and economic evaluation of the Philadelphia urban gardening project. *Society for Nutrition Education*, 23, 161-167.
- Bratman, G. N., Hamilton, J. P., Hahn, K. S., Daily, G. C., & Gross, J. J. (2015). Nature experience reduces rumination and subgenual prefrontal cortex activation. *PNAS*, 112(28), 8567-8572.

- Bureau of Land Management. (2013). The wilderness idea. National Conservation Lands, Department of the Interior. Retrieved from http://www.blm.gov/wo/st/en/prog/blm_special_areas/NLCS/wilderness2/Wilderness_FAQ.html
- Coley, R. L., Sullivan, W. C., & Kuo, F. E. (1997). Where does community grow? The social context created by nature in urban public housing. *Environment and Behavior*, 29(4), 468-494.
- Comstock, N., Dickinson, L. M., Marshall, J. A., Soobader, M. J., Turbin, M. S., Buchenau, M., & Litt, J. S. (2010). Neighborhood attachment and its correlates: Exploring neighborhood conditions, collective efficacy, and gardening. *Journal of Environmental Psychology*, 30, 435-442.
- Cronon, W. (1995). The trouble with wilderness; or, getting back to the wrong nature. In W. Cronon (Ed.), *Uncommon ground: Rethinking the human place in nature* (69-90). New York, NY: W. W. Norton & Company Ltd.
- Curran, W., & Hamilton, T. (2012). Just green enough: Contesting environmental gentrification in Greenpoint, Brooklyn. *Local Environment*, 17, 1027-1042.
- Denevan, W. M. (1992). The pristine myth: The landscape of the Americas in 1492. *Annals of the Association of American Geographers*, 82(3), 369-385.
- De Vries, S., van Dillen, S. M. E., Groenewegen, P. P., & Spreeuwenberg, P. (2013). Streetscape greenery and health: Stress, social cohesion and physical activity as mediators. *Social Science & Medicine*, 94, 26-33.

- Diegues, A. C. (1998). Recycled rain forest myths. In M. P. Nelson & J. B. Callicott (Eds.), *The wilderness debate rages on* (264-281). Athens, GA: The University of Georgia Press.
- Division of Agriculture and Natural Resources, University of California. (2008). *Land use and planning policies to support community and urban gardening*. Retrieved from <http://ucanr.edu/sites/thevictorygrower/files/101571.pdf>
- Duvall, J., & Kaplan, R. (2014). Enhancing the well-being of veterans using extended group-based nature recreation experiences. *Journal of Rehabilitation Research & Development*, 51, 685-696.
- Freeman, C., Dickinson, K. J. M., Porter, S., & van Heezik, Y. (2012). "My garden is an expression of me": Exploring householders' relationships with their gardens. *Journal of Environmental Psychology*, 32, 135-143.
- Fried, M. (1982). Residential attachment: Sources of residential and community satisfaction. *Journal of Social Issues*, 38(3), 107-119.
- Frumkin, H. (2013). The evidence of nature and the nature of evidence. *American Journal of Preventative Medicine*, 44(2), 196-197.
- Gonzalez, M. T., & Kirkevold, M. (2013). Benefits of sensory garden and horticultural activities in dementia care: A modified scoping review. *Journal of Clinical Nursing*, 23, 2698-2715.
- Gross, H., & Lane, N. (2007). Landscapes of the lifespan: Exploring accounts of own gardens and gardening. *Journal of Environmental Psychology*, 27, 225-241.

- Han., F. (2008). Cross-cultural confusion: Application of world heritage concepts in scenic and historic interest areas in China. In M. P. Nelson & J. B. Callicott (Eds.), *The wilderness debate rages on* (252-263). Athens, GA: The University of Georgia Press.
- Harris, M. (2009). *Ecological gardening: Your safe path to a healthy, beautiful garden*. Toronto: Random House.
- Hynes, H. P., & Howe, G. (2002). Urban horticulture in the contemporary United States: Personal and community benefits. *Acta Horticulturae*, 643, 171-181.
- Jones, A. M. (2013). *Between urban and wild: Reflections from Colorado*. University of Iowa Press: Iowa City.
- Kam, M. C. Y. & Siu, A. M. H. (2010). Evaluation of a horticultural activity programme for persons with psychiatric illness. *Hong Kong Journal of Occupational Theory*, 20(2), 80-86.
- Kaplan, R. (1973). Some psychological benefits of gardening. *Environment and Behavior*, 5(2), 145-162.
- Kaplan, R. (1983). The role of nature in the urban context. In I. Altman & J. F. Wohlwill (Eds.), *Behavior and the natural environment* (pp. 127-161). New York, NY: Plenum Press.
- Kaplan, R. (2001). The nature of the view from home: Psychological benefits. *Environment and Behavior*, 33, 507-542.
- Kaplan, R., & Kaplan, S. (1989). *The experience of nature: A psychological perspective*. New York, NY: Cambridge University Press.

- Kaplan, S. (1995). The restorative benefits of nature: Toward an integrative framework. *Journal of Environmental Psychology*, 15, 169-182.
- Klaver, I. (2008). Wild: Rhythm of the appearing and disappearing. In M. P. Nelson & J. B. Callicott (Eds.), *The wilderness debate rages on* (485-499). Athens, GA: The University of Georgia Press.
- Kuo, F. E., & Sullivan, W. C. (2001). Environment and crime in the inner city: Does vegetation reduce crime? *Environment and Behavior*, 33(3), 343-367.
- Kweon, B., Sullivan, W. C., & Wiley, A. R. (1998). Green common spaces and the social integration of inner-city older adults. *Environment and Behavior*, 30(6), 832-858.
- Levy, D. K., Comey, J., & Padilla, S. (2006). *Keeping the neighborhood affordable: A handbook of housing strategies for gentrifying areas*. Retrieved from <http://www.urban.org/sites/default/files/publication/50796/411295-Keeping-the-Neighborhood-Affordable.PDF>
- Maskit, J. (2008). Something wild? Deleuze and Guattari, wilderness, and purity. In M. P. Nelson & J. B. Callicott (Eds.), *The wilderness debate rages on* (461-484). Athens, GA: The University of Georgia Press.
- Mayer, F. S., Frantz, C. M., Bruehlman-Senecal, E., & Dolliver, K. (2009). Why is nature beneficial? The role of connectedness to nature. *Environment and Behavior*, 41(5), 60-643.
- Merchant, C. (2003). *Reinventing Eden: The fate of nature in Western culture*. New York, NY: Francis Books, Inc.
- Muir, J. (1901). *Our national parks*. Boston, MA: The Riverside Press.

- National Park Service. (n.d.). *Wilderness: Frequently asked questions*. Retrieved from <https://wilderness.nps.gov/faqnew.cfm>
- Nature. (n.d.). In *Oxford Dictionaries* online. Retrieved from <https://en.oxforddictionaries.com/definition/nature>
- Nelson, M. P., & Callicott, J. B. (2008). Introduction. In M. P. Nelson & J. B. Callicott (Eds.), *The wilderness debate rages on* (1-17). Athens, GA: The University of Georgia Press.
- Nisbet, E. K., & Zelenski, J. M. (2011). Underestimating nearby nature: Affective forecasting errors obscure the happy path to sustainability. *Psychological Science*, 22(9), 1101-1106.
- Nutsford, D. Pearson, A. L., & Kingham, S. (2013). An ecological study investigating the association between access to urban green space and mental health. *Public Health*, 127, 1005-1011.
- Peen, J., Schoevers, R. A., Beekman, A. T., & Dekker, J. (2009). The current status of urban-rural differences in psychiatric disorders. *Acta Psychiatrica Scandinavica*, 121(2), 84-93.
- Pretty, J., Peacock, J., Sellens, M., & Griffin M. (2005). The mental and physical health outcomes of green exercise. *International Journal of Environmental Health Research*, 15(5), 319-337.
- Shanahan, D. F., Lin, B. B., Bush, R., Gaston, K. J., Dean, J. H., Barber, E., & Fuller, R. A. (2015). Toward improved public health outcomes from urban nature. *American Journal of Public Health*, 105(3), 470-477.

- Smith, K. K. (2005). What is Africa to me? Wilderness in black thought, 1860-1930. In M. P. Nelson & J. B. Callicott (Eds.), *The Wilderness Debate Rages On* (pp. 300-324). Athens, GA: University of Georgia Press.
- Sturm, R., & Cohen, D. (2014). Proximity to urban parks and mental health. *The Journal of Mental Health Policy and Economics*, 17(1), 19-24.
- Sullivan, W. C., & Kaplan, R. (2016). Nature! Small steps that can make a big difference. *Health Environments Research & Design Journal*, 9(2), 6-10.
- Taylor, M. S., Wheeler, B. W., White, M. P., Economou, T., & Osborne, N. J. (2015). Research note: Urban street tree density and antidepressant prescription rates – a cross-sectional study in London, UK. *Landscape and Urban Planning*, 136, 174-179.
- Teig, E., Amulya, J., Bardwell, L., Buchenau, M., Marshall, J. A., & Litt, J. S. (2009). Collective efficacy in Denver, Colorado: Strengthening neighborhoods and health through community gardens. *Health & Place*, 15, 1115-1122.
- Thompson, C. W. (2011). Linking landscape and health: The recurring theme. *Landscape and Urban Planning*, 99, 187-195.
- Thompson, C. W., Roe, J., Aspinall, P., Mitchell, R., Clow, A., & Miller, D. (2012). More green space is linked to less stress in deprived communities: Evidence from salivary cortisol patterns. *Landscape and Urban Planning*, 105, 221-229.
- Turner, J. M. (2002). From woodcraft to “leave no trace”: Wilderness, consumerism, and environmentalism in twentieth-century America. In M. P. Nelson & J. B. Callicott

- (Eds.), *The wilderness debate rages on* (137-169). Athens, GA: The University of Georgia Press.
- Ulrich, R. S. (1981). Natural versus urban scenes: Some psychophysiological effects. *Environment and Behavior*, 13(5), 523-556.
- Ulrich, R. S. (1984). View from a window may influence recovery from surgery. *Science*, 224, 420-421.
- Ulrich, R. S., Simons, R. F., Losito, B. D., Fiorito, E., Miles, M. A., & Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. *Journal of Environmental Psychology*, 11(3), 201-230.
- United States Census Bureau. (2010). Frequently Asked Questions. United States Department of Commerce. Retrieved from <https://ask.census.gov/faq.php?id=5000&faqId=5971>
- United States Forest Service. (n.d.). Open space conservation. United States Department of Agriculture. Retrieved from <http://www.fs.fed.us/openspace/>
- Van den Berg, A. E., & Custers, M. H. G. (2011). Gardening promotes neuroendocrine and affective restoration from stress. *Journal of Health Psychology*, 16(1), 3-11.
- Westlund, S. (2015). 'Becoming human again': Exploring connections between nature and recovery from stress and post-traumatic distress. *IOS Press*, 50, 161-174.
- Wilson, E. O. (1984). *Biophilia*. Cambridge, MA: Harvard University Press.
- Wolch, J. R., Byrne, J., & Newell, J. P. (2014). Urban green space, public health, and environmental justice: The challenge of making cities 'just green enough.' *Landscape and Urban Planning*, 125, 234-244.

- Wood, C. J., Pretty, J., & Griffin, M. (2015). A case-control study of the health and well-being benefits of allotment gardening. *Journal of Public Health*, 38(3), e336-e344.
- World Health Organization, United Nations Habitat. (2010). *Hidden cities: Unmasking and overcoming health inequalities in urban settings*. Retrieved from http://www.who.int/kobe_centre/publications/hiddencities_media/p1_who_un_habitat_hidden_cities.pdf
- York, M., & Wiseman, T. (2012). Gardening as an occupation: A critical review. *British Journal of Occupational Therapy*, 75(2), 76-84.