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Urban Green Space for Mental Wellness

Reflect, Restore, and Heal

Text by Kathleen Wolf
Images as credited

One doesn't have to leave the city and travel to dramatic parks or landscapes to experience the cognitive enhancement that nature provides.

More than 20 years ago, I made a high-risk choice. I was in graduate school and had enjoyed classes in remote sensing, hydrology, and even business. But I chose to first, earn a PhD with a social science focus, and second, work in the urban context. After graduation, I came to learn just how many career obstacles there could be. At that time, prevailing perceptions were that real nature was outside the city, and real science was not about people.

Today, that decision, and the commitment shared by my colleagues and friends, has played out to be a very satisfying professional path. As a scientist, I have made modest contributions to the world's knowledge about the importance of nearby nature in cities for human health, wellness, and quality of life. My community of science once generated a trickle of benefits evidence; our growing tribe is now generating a torrent of research findings.

Challenges in Urban Life

Daily commuting. Work demands. The hyper scheduling of households. Digital connections that link one to the world 24/7. Money worries. Urban life is complicated and includes many stressors. Scientists once studied the health consequences of major stress events (such as loss of a job or loved one). We now know that the constant press of urban life generates chronic stress and anxiety, with debilitating effects. Life's stressors, combined with other factors, can lead to both physical and mental health issues.

More than 50 percent of the world's population now live in cities, and in some nations, such as the United States, the proportion is above 80 percent. Further concentration in urban areas is forecasted. Both the social and physical environments of one's life play a role in a person's response to daily challenges. As more people move into urban centres, they live within places and conditions that impose demands that can compromise health, including mental health and function.

State of the Science

Natural systems in cities, if well planned and designed, generate a wide range of environmental services that are the foundation for healthy urban living, such as clean air, clean and plentiful water, climate stabilisation, and reduced hazards. Social scientists are now working with the biophysical scientists who have helped us learn about such things to address the socio-ecological systems that are the essence of cities. While early urban ecology studies were about nature in the city, that is, how wildland understandings might translate to bits of nature *in* the city, current studies are *of* the city and recognise the integration of human systems across all urban environments. This evolution of scale and outlook included research engagement in questions of environments, nature, and human response.[1]

The result is an extensive scientific literature about the multiple, somewhat intangible co-benefits and urban ecosystem services provided by nearby nature. Recent scientific research expands our understanding of nature's benefits. “Metro nature” is a term that describes all urban nearby nature, including parks, gardens, street trees, native ecosystem patches, community gardens, and engineered nature, such as green walls and green roofs. “Green Cities: Good Health” is a web portal that summarises thousands of scientific studies that have been done all around the world about the human health benefits associated with views of nature and activities within green spaces.[2] There is now a critical mass of scientific evidence that shows that nature in the city is not just nice to have, but also essential human habitat.

This is not the science of grand, great things, such as astronomy or seismology. It is science that, when considered across all the urbanised areas of the world, has direct, daily consequences for billions of people. Human productivity value and health services costs represent major parts of the Gross Domestic Product of many nations. Though no one has yet attempted a tally, the science of metro nature and human response has cumulative

economic implications that may rival the trillions of dollars that have been estimated for the earth's environmental services.[3]

What do we now know? There is more empirical knowledge than can be summarised in this commentary.[4] Here, I focus on several ways that experiences of nearby, everyday nature in cities can support better mental health and function. It has long been observed that experiences of nature provide mental respite and restorative experiences. Nature in the city can be beautiful, and public discussions about the community value of metro nature often end there. The following sections take this discussion to another level, explaining how having nearby nature in cities is fundamentally important for billions of people in the world.

Attention Fatigue

When focused on the demanding tasks of everyday life, a person must suppress mental distractions and impulses to be able to complete study and work tasks. More generally, urban environments heavily tax the voluntary attention control that is used to filter urgent but largely irrelevant stimuli as we go about our daily lives (such as paying attention at a crosswalk or dealing with smart phone texts). In no other time in human history has there been an equivalent demand on cognitive resources. A person's psychological ability to sustain directed attention can be depleted. The result can be feelings of irritability and frustration and an inability to stay on task or bring up key ideas from memory.

Attention Restoration Theory describes the power of nature to replenish the capacity for attention through unconscious, cognitive processes in response to natural landscapes.[5] Green spaces that are rich in certain qualities allow directed attention to recover. The inherent characteristics found in green spaces provide stimulation but place little demand on a person's ability to maintain concentration. The experience of interacting with natural environments provides opportunities for the restoration of one's mental capabilities.

Ongoing research continues to test for the nature conditions that support cognitive restoration. The attributes of certain natural environments provide opportunities for involuntary attention. It is important to note that the restorative power of nature can play out in a matter of a few minutes and can be gained by simply viewing a green space as well as moving within it.[6] The best places have a sense of "fascination", "being away", "extent", and "compatibility", conditions that are rarely experienced in highly built hardscapes.[7] One doesn't have to leave the city and travel to dramatic parks or landscapes to experience the cognitive enhancement that nature provides.

Meditation and Mindfulness

Unless one is aware of the research, the dynamic interplay of attention fatigue and the restorative potential of nature may be below consciousness. Increasingly, as people are feeling overwhelming demands in their lives, there is a conscious commitment to practising meditation and mindfulness. Benefits of meditation include improved cognitive functions, longer attention spans, and improved perceptual ability, memory, intelligence, and empathy.[8] Practising meditation may also reduce stress-induced immune system decline and behaviours.[9] Scientists are not yet sure why these responses occur, but generally agree on the benefits.

Meditation is an act of intentional focus on any number of things, including repetition of a word or phrase, an object in the visual field, sensations, or specific thoughts or personal reflections. Mindfulness exercises include similar strategies of focus to rein in the wandering mind.[10] Mindfulness is the condition of "being attentive to and aware of what is taking place in the present" with resulting benefits.[11] It enhances self-regulated functioning; that is, mindfulness sensitises individuals to inner feedback signals, allowing people to better regulate and guide themselves toward meeting their needs.[12] Mindfulness enhances the richness and vitality of moment-to-moment experiences. Mindfulness training may also improve attention-related activities, such as work or study, by enhancing some specific brain areas that support attention.[13] In one study, just four sessions of mindfulness meditation training significantly improved visuo-spatial processing, working memory, and executive functioning; study participants had greater ability to sustain attention.[14]

Acts of meditation and mindfulness help people restore order in their busy lives. Nature offers unlimited opportunities as both a setting and focal point for meditation and mindfulness. Studies of Attention Restoration Theory find that nature is inherently interesting and supports "soft fascination", thereby helping one to maintain focus with a low level of mental exertion. Nature, which is filled with intriguing stimuli, modestly grabs attention in a bottom-up fashion, allowing top-down directed-attention abilities a chance to replenish.[15] Within even the smallest spaces, one can find a natural organism, clouds, rustling leaves, or flitting birds that one can calmly observe. Often a bit of nature invites one to settle in and develop an appreciation as one begins to notice remarkable details.

Creativity

Studies of nearby nature and mental capacity typically focus on one concept or dimension of outcome or response. Looking across the recent research, it seems that having access to nearby nature may be necessary on many levels to be able to cope with urban lifestyles and achieve the intentional thought needed to achieve one's goals. Nature restores when the mind is depleted. Nature enables the intentional, mindful focus that is becoming recognised as a need in high-performance jobs and careers.

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1. Complex, biodiverse landscapes offer visual features that can serve as the focus of attention, and they can be placed within workplace settings for workers' benefit (Photo: Guy Kramer).
2. Street trees can provide many ecosystem services. Simply having trees in a streetscape also provides opportunities for better mental wellness (Photo: Guy Kramer).
3. Taking time out for a mindful review of the day and one's life can help relieve stress. Views of nature offer a soft fascination that encourages mental fatigue recovery and reflection (Photo: Guy Kramer).
4. The Nature Sacred programme (of the TKF Foundation) has funded more than 120 richly detailed gardens in the northeastern United States, each meant to be a contemplative space for respite and restoration (Photo: TKF Foundation).

People have long used performance-enhancing substances to bring out their best, but nature can be the backdrop that equitably supports performance for all people.

Creativity is another potential benefit. In a study of creative professionals in Denmark, it was found that experiences of nature enhance creativity. How? Nature can evoke creative ways of thinking by making a person more curious, inspiring new ideas, and introducing more flexibility in how one thinks about a problem. It was found that nature contact may be especially helpful in two early phases of the creative process.[16] Creative individuals reported finding novel ideas in the project preparation phase by observing the patterns and visual structures in nature. People used nature in the incubation phase as a space to reflect and develop more definition for a project or to take a break and regain perspective. Feelings of peace, quietness or serenity, and beauty within nature, enhanced by the suggestion of mystery, were the landscape traits that creatives called out.[17]

Complexity

Research dating back nearly 40 years has focused on what is perceivable, pleasant, and noticeable in landscapes. And these academic efforts are related to more general cognitive pursuits. Humans seem to have an innate hunger for information; we are "info-vores." The craving begins with a simple preference for certain types of stimuli, then proceeds to more sophisticated levels of perception and cognition.[18]

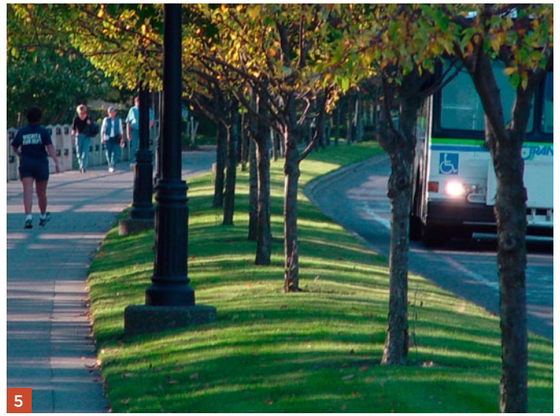
Related to our information-seeking efforts, the degree of fascination and attention-holding possibilities of nature are, in part, related to complexity. Psychologists have found that if visual information is simplified and rapidly assessed, it does not hold attention. Monocultures or simple geometric patterns in landscapes rapidly reveal their content and can fail to hold interest for very long.

On the other hand, if an outdoor scene is overly complicated, a viewer may find that almost automatic efforts to make sense of the space are frustrated and one then feels uninterested or even uncomfortable. Intermediate complexity is most preferred as people are hardwired to seek to understand their surroundings. Complexity must be accompanied by some degree of structure and order for a landscape or nature setting to be experienced in a positive way.[19] While these concepts are related to judgments of aesthetics and the beauty of the outdoors, they are also probably associated with the natural settings that encourage restorative or mindful experiences and with creativity.

Mental Wellness and Ecology

There is increasing interest in the connections between healthy landscapes and the settings that promote human health and wellness.[20] Certain landscape traits are more closely aligned with positive human responses. Biodiversity, meaning the conservation or planning of green spaces to optimise both plant and animal diversity, is becoming more prominent in policy in cities. Ranging from increased urban agriculture productivity to promoting landscape resistance to pests and climate change, biodiversity in the city, not just in pristine landscapes of wild land or rural areas, is now more widely accepted.

In many cities, metro nature must be multitasking. New public landscapes are difficult or expensive to acquire as development density limits the amount of available land. While a garden or park in a city may have a primary function of recreation or horticulture display, the land can also be nurtured to provide other benefits, both ecological and social. Biodiversity and human mental health may be an exceptional multitasking opportunity.[21] Biodiverse landscapes enable a broad array of ecological functions, such as wildlife habitat, better air quality, and stormwater management. In conserving or restoring biodiversity to urban parcels, ecologists could work more closely with public health officials and environmental psychologists to explore how to infuse biological complexity with the degree of visual order and coherence that encourages public use for mental health and function. The complex web of nature could support restorative experiences and provide the focus for mindfulness and creative inspiration.



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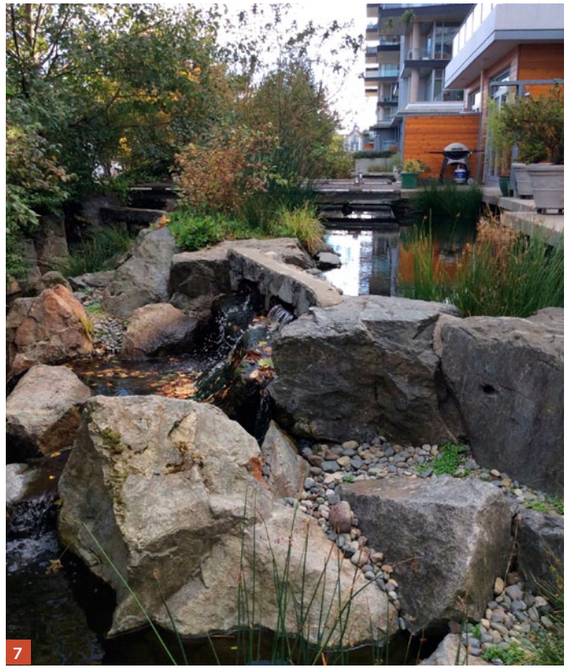

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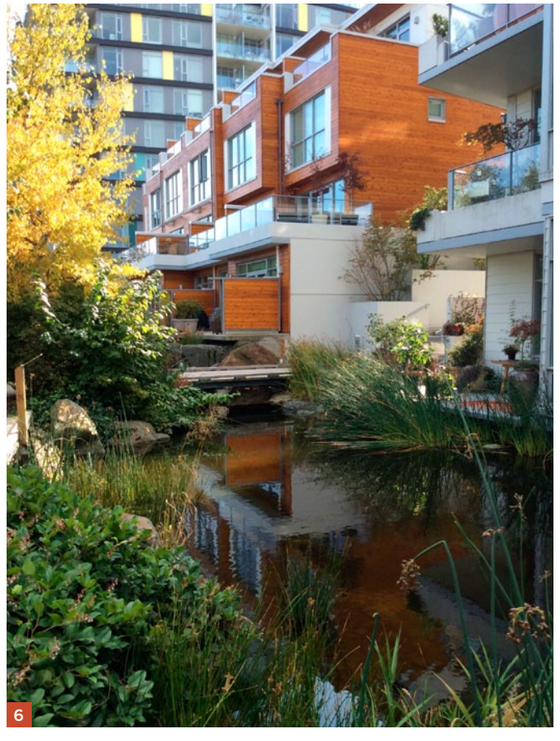

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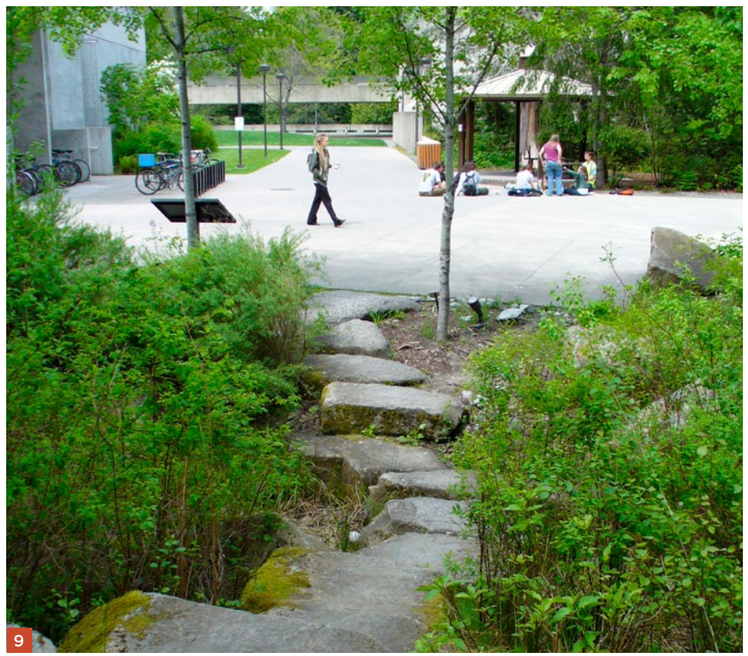
5. Some people find that activity is helpful for mental restoration and creative processing. Systems of green streets, parks, and gardens are critical for vibrant cities and residents' health (Photo: Guy Kramer).
6. Both public and private landscapes can be designed to offer a set of spaces and experiences that can soothe the overtaxed mind. This example is from a stormwater management project in Victoria, Canada (Photo: Kathleen Wolf).
7. Green infrastructure can be integrated into a community as a stormwater management strategy that functions as a system and offers experiences that enable mental recovery. Water sounds can be particularly restorative (Photo: Kathleen Wolf).
8. Well-designed spaces, such as the High Line in New York City, provide opportunities for restorative experiences even during cold seasons (Photo: Kathleen Wolf).



9. Views of nature from windows and opportunities to move within landscapes provide diverse opportunities for creative processing (Photo: Kathleen Wolf).

Future Visions

Cities are the centres of economic activity, innovation, and complex social networks all over the world. People have to be at their best to compete, even survive, in the urban context. Metro nature is generally recognised to provide beauty and perhaps recreational opportunities, but is rarely considered to be essential to the productivity of people and the organisations that they work for. Recent research tells us that, in addition to meeting basic needs like clean air and water, metro nature promotes a state of mind that can both help people cope with the complexities of urban living and be more productive. People have long used performance-enhancing substances to bring out their best, but nature can be the backdrop that equitably supports performance for all people.

Few cities have the extent and quality of nature to support mental health and functioning for all residents. Geospatial analysis of cities reveals that trees, parks, and green spaces are, first, rarely adequately provided in terms of both extent and quality. Second, mapping analysis also discloses that nature amenities are not equitably distributed, with neighbourhoods of lower socio-economic status often having less quantity of and lower-quality green features, including parks and trees. Once such conditions are made obvious, cities often respond with policies to boost the presence of metro nature, particularly serving people who face mental health challenges, such as inadequate employment and lack of access to quality education and health services.

But noting the current and ever expanding scientific evidence of nature-based mental health and wellness benefits, broader greening policies are needed to plan nature in the city using a systems approach. Cities may implement green infrastructure as neighbourhood or full city systems to address air and water quality. Daylighted streams or animal habitat corridors weave through some cities. Similar structure is needed to incorporate nature into the fabric of the city in a way that enables residents' access for psychological benefit on a routine and frequent basis. Attention to design is important, as parks and green spaces that promote other health benefits, such as active living, may not have the features that are compatible with more contemplative, serene encounters. Certain land uses should be priortised for mental health–oriented greening, such as schools, office buildings, or corporate centres. A network of carefully designed outdoor spaces that enables mindfulness, attention restoration, and creativity may generate economic benefits as residents and workers improve mental capabilities and experience improved quality of life.

Acknowledgements

Writing support was provided by the USDA Forest Service, Pacific Northwest Research Station, and the TKF Foundation.

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