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A Hypothetical Depiction of The Nature Pyramid (Concept: Tanya Denckla-Cobb)

## Nature as Essential Nutrition

# Exploring the Nature Pyramid

Text and images by Timothy Beatley  
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## What amounts of nature, different nature experiences, and exposure to different sorts of nature together constitute a healthy existence?

The following is an excerpt from a similarly titled essay by the author. The full essay, published on August 7, 2012, can be accessed on *The Nature of Cities*, a collective blog founded and edited by Dr. David Maddox on cities as ecological spaces.

I have long been a believer in E.O. Wilson's idea of *biophilia*: that humans are hardwired from evolution to need and want contact with nature. To have a healthy life, emotionally and physically, requires this contact. The empirical evidence of this is overwhelming: exposure to nature lowers our blood pressure; lowers stress and alters mood in positive ways; enhances cognitive functioning; and in many ways makes us happy. Exposure to nature is one of the key foundations of a meaningful life. How much exposure to nature and outdoor natural environments is necessary, though, to ensure healthy child development and a healthy adult life? We don't know for sure but it might be that we need to start examining what is necessary. Are there such things as minimum daily requirements of nature? And what do we make of the different ways we experience nature and the different types of nature that we experience? Is there a good way to begin to think about this?

### A Powerful Idea

At the University of Virginia (Charlottesville, VA, USA), we developed a metaphor and tool similar to the nutrition pyramid that has for many years been touted by health professionals and nutritionists as a useful guide for the types and quantity of food that we need to eat to be healthy, the *Nature Pyramid*. Towards the top end of that nutritional pyramid are things that while important to overall nutrition—meat, dairy sugar, salt—are less healthful in larger quantities and should be consumed in the smallest proportions. Moving down the pyramid are elements in the diet—fruits and vegetables—that should be consumed more frequently and in greater quantity, and then finally, grains that provide healthy nutrients and carbohydrates that are needed on a daily basis. The Nature Pyramid would work in a similar way. Presented in the graphic below, it is a useful way to begin to explore and discuss the amounts and types of natural experiences we need to live a healthy life.

The Nature Pyramid, then, challenges us to think about what the analogous quantities of nature are, and the types of nature

exposures and experiences needed to bring about a healthy life. Exposure to nature is not an optional thing, but rather a necessary and important element of a healthy human life. So, like the nutritional pyramid, what specifically is required of us? What amounts of nature, different nature experiences, and exposure to different sorts of nature together constitute a healthy existence? While we may lack the same degree of scientific certainty or confidence about the mix of requisite nature experiences necessary to ensure a healthy life (or healthy childhood), as exists with respect to diet and nutrition (and of course there remains much disagreement even about this), the Pyramid at least starts an essential and important conversation that needs to occur.

The Nature Pyramid helps us to start thinking about what will be necessary to counter what journalist Richard Louv calls the "nature deficit disorder" in his important book *Last Child in the Woods* (Algonquin, 2005) and further explored in his more recent book *The Nature Principle* (Algonquin 2012). It is helpful for several reasons. First and foremost perhaps is the important message that, like one's diet, it is possible to act in ways that lead to a healthy mix of and exposure to nature. This is subject to agency and behaviour and responsible choice in the same way that the food pyramid guides eating. And, like the nutritional pyramid, the Nature Pyramid provides guidance to planners, designers, and public decision-makers. We have important choices about community design: what we choose or choose not to subsidise, what nature opportunities we want our children and adults to have available to them, and what steps might make a healthier biophilic life more feasible or possible.

### What Should Make Up the Bulk of Our Nature Diet?

At the bottom of the Pyramid are forms of nature and outside life that should form the bulk of our daily experiences. Here there are the many ways in which we might enjoy and experience nature daily, both suburban and urban. As adults, a healthy nature diet requires being outside at least part of each day, walking, strolling, sitting,

though it need not be in a remote and untouched national park or otherwise more pristine natural environment. Brief experiences and brief episodes of respite and connection are valuable: watching birds, hearing the outside sounds of life, and feeling the sun or breeze on one's arms are important natural experiences, even though fleeting. Some of these experiences are visual and we know that even views of nature from office or home windows provide value. For school-aged kids, spending the day in a school drenched in full-spectrum nature daylight is important, and we know that the evidence about the emotional and pedagogical value of this is compelling. Every day kids should spend some time outside, playing or running, in direct contact with nature, weather, and the elements.

Moving from the bottom to the top of the Pyramid also corresponds to an important temporal dimension. We need and should want to visit larger more remote parks and natural areas, but for most of us, the majority of these larger parks will not be within distance of a daily trip. At the top of the Pyramid are places and nature experiences that are profoundly important and enriching, yet more likely to happen less frequently, perhaps only several times a year. They are places of nature where immersion is possible, and where the intensity and duration of the nature experience are likely to be greater. And in between these temporal poles (from daily to yearly) lie many of the nature opportunities and experiences that happen often on weekends or holidays or every few weeks, and perhaps without the degree of regularity that daily neighbourhood nature experiences provide.

Like the food items higher on the food pyramid, the sites of nature highest on the Nature Pyramid might best be thought of occasional treats in our nature diet—good for us in small and measured servings, but actually unhealthy if consumed too often or in too great a quantity. For many urbanites from the industrialised North, large amounts of money and effort are expended visiting remote eco-spots, from Patagonia, to the cloud forests of Costa Rica, to the Himalayas. It seems we relish and celebrate the ecologically remote and exotic. While they are deeply enjoyable nature experiences, to be sure, they come at a high planetary cost, as the energy and carbon footprint associated with jetting to these places is large indeed. Such trips are no longer appreciated as unique and special “trips of a lifetime” but rather fairly common and increasingly pedestrian jaunts to the affluent citizenry of the North. The Nature Pyramid sends a useful signal that travel to faraway nature may as glutinous and unhealthy as eating at the top of the food pyramid.

Another message is that a diversity of nature experiences will yield a healthy life, in the same way that a diversity of foods and food groups leads to a healthy diet. The middle of the Pyramid suggests the need for larger local and regional green spaces that provide more respite and deeper engagement than street trees or green rooftops might. They can be visited less frequently, but perhaps with greater duration and intensity, say on a weekly or bi-weekly basis. The Nature Pyramid allows us to imagine lives lived mostly in urban (albeit green urban) environments but with some substan-





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2. Casual interaction with nature—in this case street trees in Madrid—should be experienced in daily doses.

3. A park—in Oslo, Norway—which makes for a slightly more immersive nature experience.

4, 5. Areas such as the Southern Ridges (Fig. 4) and Dairy Farm Nature Park (Fig. 5) in Singapore provide more intense experience with nature higher on the Pyramid (Photos: Jeremy San (Fig. 4) and Francis Lee (Fig. 5)).

6. Torres del Paine National Park in Southern Chile: an experience, at least for people from outside South America, that would be high on the Nature Pyramid (Photo: David Maddox).

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tial amount of time spent in more classically natural environments around and outside cities. The Pyramid lets us begin to imagine—as we imagine the combinations of food and types of food that go into our daily and weekly diets—the combination of different nature experiences essential to a healthy human life.

### Overcoming the Nature-Urban Dichotomy

The Nature Pyramid encourages us to overcome the paralysis of the modern urban-nature split that many of us perceive. Cities and urbanised areas typically provide less direct contact with the kind of pristine nature we often think we need. There are good and important reasons that we live in cities, and from the perspective of sustainability and sustainable living, cities are an essential aspect of effectively addressing global environmental problems. Yet, the types of nature found in cities are more fragmented, smaller, and generally allow less and shorter kinds of immersion than, say, camping in a remote wilderness area or spending several days in a national park. But as the planet continues to become more urban the challenge of providing the essential minimum dosage of nature becomes an increasingly important challenge everywhere.

Many of the techniques currently used to green urban environments provide value—"nature nutrients" if you will—in the lower rungs of the Pyramid. Green design features, such as eco-rooftops, bioswales and rain gardens, community gardens, trees and tree-lined streets, and vegetation strips and urban landscaping, provide valuable ecological services (from retaining stormwater, to moderating the urban heat island problem, to sequestering carbon), as well as exposure to nature for urban residents, albeit in a human-altered context. The Pyramid helps us see how the daily consumption of and exposure to the myriad green features of cities provide, like a balanced food diet, a healthy mix of nature experiences. It helps us to appreciate the valuable exposure to many smaller green features and nature episodes in the course of a day, and importantly, the need to include these features in urban design.

### Thinking About "Servings" and "Nutrients"

Though there are many unknowns in this conceptual framework,

the Nature Pyramid is valuable in identifying and framing important questions. One such question is whether the "servings" should be measured in this nature diet. What is the unit of measurement that we ought to speak of in terms of a nature experience, say a walk or other time outside that takes 20 minutes or a half an hour, or something qualitatively different, say a momentary sighting of a bird, or tree, or distinctive mushroom? Is a ten-second glance out the window at work onto a verdant courtyard adequate to compose a "serving"? Is the momentary wonder at the interaction of two birds, at the joyous sight of a circling hawk, the scolding chatter of a squirrel as you pass by that corner lot with the large trees, a useful serving? And how, over the course of an hour, an afternoon, a day, do these servings add-up or accumulate to form the nature nutrition we need?

Often our nature servings don't nicely fit into any description of an event or episode, and are more continuous, less discrete: for instance, the aural background of natural sounds the katydids, tree frogs, and crickets that compose the night soundscape that many of us find so replenishing and soothing. One's day is, in fact, made up of unique and complex combinations of these nature experiences (or they should be), some fleeting and momentary, others of longer duration and intensity. The Nature Pyramid helps us, or at least calls upon us, to develop some form of metric for understanding this richness and complexity and to understand how (or not) these different experiences add up over the course of a day, week, month, or year to a healthy life in close and nurturing contact with the natural world.

There are other important open questions highlighted by the Nature Pyramid. Is it possible to imagine more intensive, immersive nature experiences—even in normal everyday urban environments, urban places, and smaller urban environments—that may deliver the restorative power of experiences higher on the Pyramid? And can we design them in ways that intensify these experiences? A brief visit to a forested urban park, or botanic garden, could in theory permit an immersive experience equal to more distant forms of nature. Again, these are important questions that the framework of the Nature Pyramid helps us to identify and focus on.

The Nature Pyramid encourages us to look around at the actual communities and places where we live in to see if they are delivering the nature nutrients and diet we need. Yale professor Stephen Kellert argues that we need to overcome the sense that nature is “out there, somewhere else”, probably a national park, and what we need today more than ever is “everyday nature”, the nature all around us in cities and suburbs. Much is there, of course, if we look, but we must also work to enhance, repair, and creatively insert new elements of nature wherever we can, from sidewalks to courtyards, from alleyways to rooftops, from balconies to skygardens. Less frequent perhaps are the deeper and longer episodes—the visit to a regional park, the longer hike along a nature trail or through a regional trail or greenway system, beyond one’s immediate neighbourhood. These experiences might for some happen daily, but likely don’t. They are more infrequent, tending to occur more on a weekly than daily basis.

The Pyramid most importantly helps us to see that for most individuals, living a healthy urban life in touch with nature is a function of the daily, weekly, and monthly (and even less frequent) nature experiences we have. Ensuring that we provide the minimum dosage or serving of nature should be a priority for all planners and designers.

### A Rich Research Agenda

While the Nature Pyramid already provides us with important policy and planning insights and guidance, there are clearly many important open questions and a significant (and exciting) research agenda that flows directly from it. Addressing these questions will require the good work of researchers in a number of disciplines, including medicine and public health, psychology, and of course the design disciplines of landscape architecture and city planning, among many others. The research questions are not easy ones, as this essay has shown, but are in fact rather complex. There is a need to focus on the natural elements and processes of neighbourhood urban nature (trees, birds, gardens), the different ways in which these elements are experienced or enjoyed (listening, seeing, digging in soil), and the many factors that may influence their emotional import and “nutritional value” (whether

they are experienced alone or enjoyed with others, with friends and family, for example). And there is a need to better understand and describe more precisely the outcomes or benefits delivered, that is, the ways in which exposure to nature makes us happier and healthier.

And there are complex behavioural cascades that will need to be better understood. For instance, If we feel happier when we see trees and vegetation in our neighbourhoods, we are more inclined to spend time outside and engage in walking, strolling, hiking and other physical activity, in turn delivering important physical health benefits. Equally true, trees and nature create contexts for socialising, in turn delivering important emotional benefits (and we already have considerable evidence about the many health benefits of friendships). So the research task becomes one of better understanding how and in what ways the nature in cities can set in motion other positive health outcomes (and again, which natural elements, experiences, features, or processes, and in which combinations, will trigger these valuable cascades).

Some of this research is already underway through the Biophilic Cities Project, at the University of Virginia, with funding from the Summit Foundation and the George Mitchell Foundation. Much of the work has focused on learning from emerging biophilic cities around the world, and the tools, techniques, and ideas these exemplary cities are employing to deliver nature to their citizens and to foster connections and contact with the nature. The research would also involve deriving a better understanding of the comparative emotional and restorative value of different combinations of urban nature.

The Nature Pyramid, rather than an answer or a complete and fully developed model, is but the beginning point, a provocation to explore and innovate and better understand the important ways in which everyday neighbourhood nature can help to deliver the essentials of a happy, healthy, and meaningful urban life. 